IAS BABA

One Stop Destination For UPSC/IAS Preparation

Baba's Monthly
CURRENT AFFAIRS MAGAZINE

National Maritime
Heritage Complex

Samburu Warriors
Rock Art

Living Planet
Report 2022

Bhoota Kola

World Health Organization (WHO)
releases first-ever list of health-threatening fungi

Contract Farming Law

Abortion Rights Vs Ethics

TOPPER'S RECOMMENDED

BEST CHOICE

Abortion Rights Vs Ethics

Global Multidimensional Poverty Index

Nobel Prize

PRELIMS

POLITY & GOVERNANCE

National Disaster Management Authority (NDMA)	**In News**: NDMA celebrated its 18th Formation Day on September 28, 2022, in New Delhi.
	• The theme for this year's Foundation Day **was "Volunteerism in Disaster Management".**
	About NDMA:
	• NDMA is India's **apex statutory body** for disaster management.
	• NDMA was formally constituted on 27th September 2006, by the **Disaster Management Act, 2005.**
	• **The Prime Minister is its chairperson** and it **has nine other members**. One of the nine members is designated as Vice-Chairperson.
	• Disaster Management Act also envisaged the creation of **State Disaster Management Authorities (SDMAs) headed by respective Chief Ministers and the District Disaster Management Authorities (DDMA) headed by the District Collectors/ District Magistrate and co-chaired by Chairpersons of the local bodies.**
	• The primary responsibility for the management of disaster rests with the State Government concerned. However, the National Policy on Disaster Management puts in place an enabling environment for all i.e., the Centre, state and district.
	Apda Mitra Scheme:
	• The scheme was started by NDMA to train community volunteers in disaster response in selected flood-prone districts of India.
	• More than 5500 volunteers have been trained under the pilot scheme.
	• **"Sewa, Samarpan & Paropkar"** is the identity of Aapda Mitras.
	• **Significance:** In any disaster, however quick the government machinery may be, volunteers from the affected community are normally the first to act, external help takes time to reach the affected people, and this time lag is very crucial in saving lives and livelihood.
	• **National Disaster Response Force (NDRF)** conducts community awareness programmes for the capacity building of community in disaster management.
	• NDRF is also conducting **School Safety Programme (SSP)** and imparting basic training to school children as well as teachers to evacuate themselves during an earthquake.
	• **Example of Kerela Floods 2018**: A team of 30 volunteers, managed several operations like supplying food, taking control of the Rescue Operation Centre of the district disaster management authority, handling distress calls and coordinating rescue effort with several choppers through personal contacts in Air Force and NDRF.
Young, Upcoming and Versatile Authors (YUVA 2.0)	**Context:** The Ministry of Education recently launched YUVA 2.0 – Prime Minister's Scheme for Mentoring Young Authors, a programme to train young and budding authors to promote reading, writing and book culture in the country, and project India and Indian writings globally.
	About YUVA) 2.0:
	• The **National Book Trust (NBT),** India, under the **Ministry of Education** as the Implementing Agency will ensure phase-wise execution of the Scheme under well-defined stages of mentorship.
	• It aims to promote reading, writing, and book culture in the country.
	Significance:
	• It will help to develop a stream of writers who can write on a spectrum of subjects to promote the Indian heritage, culture, and knowledge system.

	• It will also provide a window to the aspiring youth to articulate themselves and present a comprehensive outlook of Indian Democratic values at domestic as well as international platforms.
India's First Aluminum Freight Rake	**Context**: Recently the union minister for Railways recently launched India's first all-aluminium freight rail rakes. **About Aluminum Freight Rake**: • Hindalco has developed these all-aluminium freight rail rakes. • The Aluminum rakes have been developed to: • Modernise freight transportation and • Enable large carbon savings for Indian Railways. • 61-wagon rakes have been flagged off from Bhubaneswar station. **Characteristics:** • The rakes are 180 tonnes lighter than existing steel rakes. • They can carry 5-10% more payload. • They consume less energy with relatively negligible wear and tear to rolling stock and rails. **Significance**: **Saving Carbon emissions:** • The bottom discharge aluminium freight wagon, specifically designed to carry coal, is tipped to reduce the carbon footprint measurably. These wagons save 14,500 tonnes of CO_2 emissions. • For every 100 kg weight reduction of the wagon, the lifetime CO_2 saving is 8-10 tonnes. This translates to a saving of more than 14,500 tonnes of CO_2 for a single rake. **Other:** • These all-aluminium rakes offer 19% higher payload to tare weight ratio, which will have a transformative impact on the Railways' logistics and operational efficiency. • They consume less energy and are corrosion-resistant. • They are 100% recyclable and even after 30 years, they will be as good as new. **Boost for growth of sector:** • The freight sector in India is expected to grow at more than 7% CAGR to 15-billion tonnes by 2050, with the energy-efficient and eco-friendly Railways expected to notably increase its volume share from the current 18%. **Significance of using Aluminium:** • Aluminium trains command a lion's share in the United States, Europe and Japan. • This is because of its attributes such as sleek, aerodynamic designs. • They also have an ability to tilt at high speeds without going off the rails. • Aluminium is the preferred choice for metro trains worldwide for their durability and most importantly – passenger safety, as it has improved crashworthiness or superior crash absorption capability. • Indian Railways have already announced their plans to make aluminium bodied Vande Bharat train sets.
Launch of Kashi-Tamil Sangamam	**In News:** The programme, held as part of the '**Ek Bharat Shrestha Bharat'** initiative, is aimed at rekindling the civilisational link between the two places • A month-long programme to "strengthen" and "rekindle" the cultural and civilisational bond between Tamil Nadu and Varanasi • To be held from November 16 to December 16 this year

	• The period will cover the Tamil month of Karthikeya during which all Tamil households go pray to Lord Shiva
The Cellular Operators Association of India (COAI)	**Context:** Recently the Cellular Operators Association of India (COAI) pitched for regulating all OTT players, including communication over the top (OTT) players such as WhatsApp, and those such as Netflix that consumed huge bandwidth. **About COAI:** • COAI was constituted in 1995 as a registered, **non-governmental society.** • Over the years COAI has emerged as the **official voice for the Indian telecom industry** and interacts directly with Ministries, Policy Makers, Regulators, Financial Institutions and Technical Bodies. ○ **COAI collaborates with other Industry Associations such as CII, FICCI, ASSOCHAM, AUSPI, ISPAI, VSAT association etc.** • COAI's core membership includes private Telecom Service Providers, namely – Bharti Airtel Limited., Vodafone Idea Limited and Reliance Jio Infocomm Limited, operating across the whole country. • COAI's present Associate Members include –Amazon Seller Services Pvt.Ltd, Apple India, Atria Convergence Technologies Pvt. Ltd, Ciena Communications India Pvt. Ltd., Cisco Systems India Pvt. Ltd., Ericsson India Pvt. Ltd., ECI Telecom India Pvt. Ltd., Facebook India Online Services Pvt. Ltd., Google India Pvt. Ltd., Huawei Telecommunications (India) Co. Pvt. Ltd, Indus Towers Ltd, Juniper Networks Solutions India Pvt. Ltd., Nokia Networks, Qualcomm India Pvt. Ltd., Sterlite Technologies Limited and ZTE Telecom India Pvt. Ltd. • COAI has played a major role in the setting up and operations of the **Telecom Sector Skill Council (TSSC)** in India under the aegis of the **National Skills Development Corporation (NSDC).** • TSSC is registered under the **Societies Registration Act 1860**, with members from COAI, ICA, TCOE, NSDC, TAIPA, AUSPI, Govt., Telecom Industry and Academia. • COAI also played a major role in setting up the **Telecom Centres of Excellence (TCOE)** set up in **Public Private Partnership (PPP) mode**, with the Government, the Academia and the Industry working together for the sustained growth and progress of the country. • COAI was instrumental in the formation of the **Telecommunications Standards Development Society, India (TSDSI)**, which aims at developing and promoting India-specific requirements, standardizing solutions for meeting these requirements and contributing these to international standards.
'SAMRIDDHI 2022-23'	**Context:** Delhi Lieutenant-Governor recently announced a one-time property tax amnesty scheme for residents of the national capital's authorized and regularized colonies. **About SAMRIDDHI scheme:** • Under '**SAMRIDDHI 2022-23 (Strengthening & Augmentation of Municipal Revenue for Infrastructure Development in Delhi)'**, people will be able to pay only the principal amount of the current and pending tax of past five years for residential properties. • They can get a waiver on all pending dues, including penalty and interest. • The duration will be six years in case of commercial properties. • The Municipal Corporation of Delhi will have no right to reopen any property tax case after one year. • Residential property taxpayers are required to pay the principal amount of property tax for the current year and the previous five years on which a 100% exemption from interest and penalties on the outstanding tax amount will be received and a waiver of all prior dues prior to the previous five years.

	• Non-residential taxpayers are required to pay the principal amount of property tax for the current year and the previous six years on which a 100% exemption from interest and penalties on the outstanding tax amount will be received and a waiver of all prior dues prior to the previous six years. • If a taxpayer doesn't pay his tax debt by the deadline, he will be responsible for paying all back taxes, interest, and penalties dating back to 2004 or the prior year they were unpaid, and shall not be entitled to any waiver. • The tax amnesty scheme, according to the announcement, includes a "One Plus Five" option.
Hate Speech	**In News:** A Supreme Court bench directed the police chiefs of Delhi, Uttar Pradesh and Uttarakhand to take "immediate" suo motu action against any hate speech, by lodging criminal cases without waiting for formal complaints. **IPC Sec 295A & others:** • Section 295A was brought in 1927 and is one of the main provisions in the IPC chapter to penalize religious offenses. • The chapter includes offenses to penalize damage or defilement of a place of worship with intent to insult the religion (Section 295); trespassing in a place of sepulture (Section 297); uttering, words, etc, with deliberate intent to wound the religious feelings of any person (Section 298); and disturbing a religious assembly (Section 296). • The state often invokes Section 295A along with Section 153A, which penalizes promoting enmity between different groups on grounds of religion, race, place of birth, residence, language, etc, and doing acts prejudicial to maintenance of harmony and Section 505 of the IPC that punishes statements conducing to public mischief. • Section 66A of the Information Technology Act, that punishes sending offensive messages through communication services is added when such speech is made online. **Judicial references:** • In 1927, Rangeela Rasool case, examined the question whether targeting religious figures is different from targeting religions. • While the magistrate had convicted the publisher Rajpaul under Section 153A, the Lahore High Court held that a "scurrilous and foul attack" on a religious leader would prima facie fall under Section 153A — although not every criticism. • This debate in interpretation prompted the colonial government to enact Section 295A with a wider scope to address these issues. • In 1957, the constitutionality of Section 295A was challenged in Ramji Lal Modi v State of Uttar Pradesh • The Supreme Court upheld the law on the grounds that it was brought in to preserve "public order" – an exemption to the fundamental right to freedom of speech and expression and the right to religion recognised by the Constitution. • In a 1960 ruling, in **Baba Khalil Ahmed v State of Uttar Pradesh**, the Supreme Court said that **"malicious intent"** of the accused can be determined not just from the speech in question but also from external sources. • In 1973, in **Ramlal Puri v State of Madhya Pradesh**, the Supreme Court said the test to be applied is whether the speech in question offends the "**ordinary man of common sense" and not the "hypersensitive man".** • In **Baragur Ramachandrappa v State of Karnataka**, a 2007 decision of the Supreme Court, "a pragmatic approach" was invoked in interpreting Section 295A.
News Broadcasting & Digital Standards Authority	**Context:** The News Broadcasting & Digital Standards Authority (NBDSA), a self-regulatory agency set up by news and digital broadcasters, has fined a news channel for turning a news debate on hijab into a "communal issue" and not adhering to guidelines.

About News Broadcasting & Digital Standards Authority (NBDSA):

- The NBDSA is an independent body set up by the News Broadcasters & Digital Association (NBDA), which serves as a representative of private television news, current affairs and digital broadcasters.
- Funded entirely by its members, the NBDA has 26 news and current affairs broadcasters (comprising 119 news and current affairs channels) as its members.
- Various senior members of Indian media organisations serve on its Board of Directors.
- Apart from presenting a unified front, it carries out activities to promote, protect and secure the interests including **the right of freedom of speech and expression of the news broadcasters, digital news media and other related entities.**

Functions and Powers:

- Its standards mention a focus on objectivity, impartiality, maintaining discretion when reporting on crime against women and children, not endangering national security, etc.
- This can also be through complaints referred to the **Authority by the Ministry of Information & Broadcasting or any other governmental body, or by anyone else via its website.**
- A **"two-tier" procedure** is in place for redressing grievances, where any person aggrieved by the content of any broadcast is required to first make a complaint to the concerned broadcaster and if they are not satisfied by the redress, a complaint can be filed before the Authority.
- Within 14 days from the date of receipt of a complaint, the Authority will issue notice to the concerned broadcaster to show cause why action should not be taken under the regulations.
- An inquiry is held in which proof, documents, and people can be called in by the authority.
- If the complainant or the respondent does not get back to the Authority, the complaint can be set aside.
- The **fine imposed by the Authority shall not exceed Rs. 1 lakh** and such fine shall be recovered from the concerned broadcaster.

| Anti-Semitism | **Context:** The rapid and unselective use of traditional antibiotics gives rise to the emergence of drug resistant phenotype in typhoidal and non-typhoidal Salmonella serovars, which has increased the difficulties in curing Salmonella-induced food-borne illnesses (majorly typhoid or paratyphoid fever, gastroenteritis, and Diarrhea) worldwide. |

About Salmonella Typhimurium:
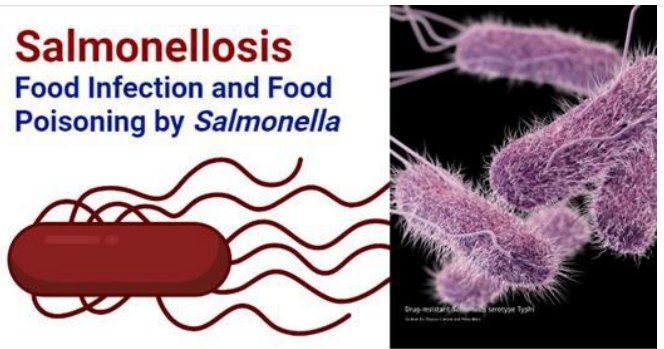
- Salmonella Typhimurium causes **gastroenteritis (inflammation of the gut).**
- **Salmonella typhimurium ST313, an invasive non-typhoidal Salmonella serovar**, causes **bloodstream infection** in the malnourished and immunocompromised population of sub-Saharan Africa.
- Recent studies have reported the **emergence of multi-drug resistant (MDR) phenotype in Salmonella typhimurium DT104**, which causes infection in humans and cattle.

About Salmonellosis:

- Salmonellosis is an infection with a bacteria called Salmonella.
- Salmonella live in the intestinal tracts of animals, including birds.
- Contaminated foods are often of animal origin, such as poultry, pork, beef, poultry, milk, or eggs, but all foods, including vegetables may become contaminated.
- Thorough cooking kills Salmonella.

	- Commonly infected foods include: - Raw meat, poultry and seafood - Raw or undercooked eggs - Unpasteurized dairy products - Fruits and vegetables

ECONOMY

Global Innovation Index	**Released by**: World Intellectual Property Organization (WIPO) **On the top**: - Switzerland has emerged as the world's most innovative economy for the 12th consecutive year. Leads on innovation outputs, and specifically in patents by origin, software spending, high-tech manufacturing and production and export complexity. - The second position was secured by the United States (US) followed by Sweden, the United Kingdom (UK) and the Netherlands. - The rankings were based on the areas of: **Human and capital research, Business sophistication, Infrastructure and Technology outputs.** **India s**ecured the 40th position in the Global Innovation Index. - This is the first time the country entered the top 40. Last year, India was at the 46th position.
Card Tokenization	**Content:** Recently the Reserve Bank of India (RBI) signalled that it would not extend the deadline for implementation for tokenization of card based payments and mandated the adoption of card-on-file (CoF) tokenization as an alternative to card storage. This rule is applicable to all stakeholders except card issuers and card networks. In this context let us understand the process of Tokenization. **What is Tokenization?** - Tokenization is a process by which card details are replaced by a unique code or token, allowing online purchases to go through without exposing sensitive card details. - Under tokenization services, a unique alternate code is generated to facilitate transactions through cards. - It is the process of substituting a 16 digit customer card number with a non-sensitive equivalent value, referred to as a token. - This essentially means that a customer's card information will no longer be available on any Merchant, Payment Gateway, or 3rd party that helps in the processing of digital transactions today. - With card tokenization, consumers no longer need to fear saving their card details. - Cardholders will have to give an explicit consent that will be collected for tokenization. **Who can offer tokenization services?** - Tokenization can be performed only by the authorized card network and recovery of original Primary Account Number (PAN) should be feasible for the authorized card network only. - Adequate safeguards have to be put in place to ensure that PAN cannot be found out from the token and vice versa, by anyone except the card network. RBI has emphasized that the integrity of the token generation process has to be ensured at all times.

Card Tokenization figure:

What should a cardholder do under tokenization?

- **YOU** start a purchase with a merchant
- **THE** merchant initiates tokenization by asking for your consent to Tokenize the card
- **ONCE** you give consent, it sends tokenization request to the card network
- **THE** card network creates a token as a proxy to the card number and sends it back to the merchant
- **YOU** approve transaction with CVV and OTP
- **THE** merchant saves this token for subsequent transactions
- **FOR** making payment to a different merchant or from a different card, tokenization to be done again

What is the size of the industry?

- As per the RBI's annual report for 2021-22, during 2021-22, payment transactions carried out through credit cards increased by 27 per cent to 223.99 crore in volume terms and 54.3 per cent to 9.72 lakh in value terms.

Why does the RBI want cards to be tokenized?

- Customer's card details are stored by merchants, and if their security measures are inadequate, this puts all the customers at risk. There have been several instances in the past where merchant websites have been hacked and debit and credit card details have been leaked. This is what the RBI wants to eliminate.
- By mandating card tokenization, the burden of security is now on payment processors and banks, not merchants.
- Thus, a tokenized card transaction is considered safer as the actual card details are not shared with the merchant during transaction processing.
- Tokenization ensures standardization for card on file transactions through higher security standards which is irreversible as compared to existing reversible cryptographic standards.

How does this card tokenization work?

- At check-out time on an online shopping portal, one has to enter card details and opt for tokenization. The merchant forwards it to the respective bank or the card networks (VISA, Rupay, Mastercard, etc). A token is generated and sent back to the merchant, which then saves it for the customer.
- Now, the next time the customer comes back to shop, she has to just select this saved token at check-out time. The same masked card details and last four digits of the customer's card number will be visible. Customer needs to enter your CVV and complete the transaction.
- The customer does not need to remember the token. The end-customer experience is not changing while making the payment.
- The implementation of the tokenisation request is carried out through the Additional Factor of Authentication (AFA) by the cardholder.
- This algorithmically generated token protects sensitive information and prevents card frauds as it allows you to make payments without exposing your bank details.

Benefits of tokenization in a nutshell: Largely designed to counter online frauds and curb digital payment breaches, tokenization comes with a slew of benefits. Some of them are:

- Enhanced safety and security: Tokens generated will be unique to a single card at a specific merchant and this will take up the overall security of making card-based transactions. It eliminates the risk of storing card details online and ensures the uncompromised convenience of storing customer's token details on the merchant site.
- Quicker checkouts: Tokenized Mastercard will allow the convenience of quick checkouts as one doesn't need to punch in the card number for each purchase.
- No more 'False Declines': Many times, legitimate online payments using valid cards are declined on the grounds of the transaction looking like a fraud. With tokenization, this becomes a thing of the past as the usage of tokens for payments confirms security of the highest order.
-
- Easy card management: With tokenization, one can also keep track of all your cards and the merchants they have been tokenized with.
- No need for a physical card: With tokenization, one can store a virtual version of one's card on a smartphone for the days one forgets to carry your wallet.
- Added benefits: Tokenization also comes with cashback benefits when secured with platforms like Amazon, Paytm, Swiggy, Flipkart and Phonepay among others.

Sugar Production in India	**Context**: India emerges as the world's largest producer and consumer of sugar and world's 2nd largest exporter of sugar. • In Sugar Season (Oct-Sep) 2021-22, a record of more than 5000 Lakh Metric Tons (LMT) sugarcane was produced in the country • With this, India has emerged as the world's largest producer and consumer of sugar as well as the world's 2nd largest exporter of sugar. • Maharashtra emerged as the highest sugar exporter and producer in India in 2021-22 Sugar Season (SS) exporting almost 60 per cent of total exports in India. **Factors that led to largest Producer of Sugar:** • Synchronous and collaborative efforts of Central and State Governments, farmers, sugar mills, ethanol distilleries with a very supportive overall ecosystem for business in the country led to this feat. • During 2021-22, sugar mills procured sugarcane worth more than 1.18 lakh with no financial assistance (subsidy) from Government of India. • 95% of cane dues have already been cleared. • In 2020-21, more than 99.9% cane dues are cleared. • **Scheme for Extending Financial Assistance to Sugar Undertakings (SEFASU) and National Policy on Biofuels** are two of the government initiatives to support sugarcane production and the sugar industry. **Ethanol Production:** • Government has been encouraging sugar mills to divert sugar to ethanol. • Growth of ethanol as biofuel sector in last 5 years has amply supported the sugar sector as use of sugar to ethanol has led to better financial positions of sugar mills due to: • faster payments, • reduced working capital requirements and • less blockage of funds due to less surplus sugar with mills. • Ethanol production capacity of molasses/sugar-based distilleries has increased to 605 crore litres per annum and the progress is still continuing to meet targets of 20% blending by 2025 under Ethanol Blending with Petrol (EBP) Programme. • In the new season, the diversion of sugar to ethanol is expected to increase from 35 LMT to 50 LMT which would generate revenue for sugar mills amounting to about ₹ 25,000 crores. **Sugarcane Cultivated:** • **Temperature: Between 21-27°C with hot and humid climate**. • **Rainfall: Around 75-100 cm.** • **Soil Type: Deep rich loamy soil.** • **Top Sugarcane Producing States**: **Maharashtra>Uttar Pradesh > Karnataka** • It can be grown on all varieties of soils ranging from sandy loam to clay loam given these soils should be well drained. • It needs manual labour from sowing to harvesting. • It is the main **source of sugar, Gur (jaggery), khandsari and molasses.**
Share Buyback	**In news:** Tech companies, which are sitting on a cash pile, usually prefer buybacks instead of bonus issues as the latter bloat the equity capital. • A share buyback, also known as share repurchase, is a corporate action to buy back its own outstanding shares from its existing shareholders usually at a premium to the prevailing market price. • It is seen as an **alternative, tax-efficient way to return money to shareholders.** • Shares bought back by the company will be extinguished, leading to a higher earnings per share.

- Reducing the number of shares means **earnings per share (EPS)** can grow more quickly as revenue and cash flow increase.

Few Disadvantages:

- May lead to drop in price, which means the company isn't healthy.
- Market may believe the company doesn't have growth opportunities.
- Can create challenges during economic downturn.

INTERNATIONAL RELATIONS

AUKUS alliance	**In News**: China withdrew a draft resolution against the AUKUS alliance at the general conference of the International Atomic Energy Agency (IAEA) in Vienna due to lack of majority support.

About AUKUS:

- It is a trilateral security pact between **Australia, the United Kingdom, and the United States,** announced in 2021 for the Indo-Pacific region.
- To transfer technology to build a fleet of at least eight nuclear-powered submarines armed with conventional weapons.
- The pact is also seen as a deterrence to China's aggression in the Pacific region.
- The pact also includes cooperation on advanced cyber, artificial intelligence and autonomy, quantum technologies, undersea capabilities, hypersonic and counter-hypersonic, electronic warfare, innovation and information sharing.
- It complements several pre-existing similar arrangements for the region like Five Eyes intelligence cooperation initiative, ASEAN and the Quad.

Significance of AUKUS:

- AUKUS aims to ensure that there will be freedom and openness in the Indo-Pacific region, including the South China Sea.
- Although no explicit mention was made of China in any of the AUKUS announcements, this group challenges the regional hegemonic ambitions of China.
- The operationalisation of this security partnership led to closer coordination among the nations concerned in terms of joint military presence, war games and more in the region.
- Given the inroads that China has made in recent decades with its Belt and Road Initiative in India's neighbourhood, fears over 'encirclement' of India by China may be partially mitigated by AUKUS.
- Further, India may indeed derive secondary benefits from having three advanced nations with arguably the most sophisticated military know-how in the world coming together.

Concerns about AUKUS:

- **China's opposition**: China argues that the initiative violated the Non-Proliferation Treaty. China also criticized IAEA's role in this regard. However, the AUKUS partners and the IAEA say the NPT allows marine nuclear propulsion provided necessary arrangements are made with the IAEA.
- **Australia's domestic challenges:** As per Australia's 1984 nuclear-free zone policy, nuclear-powered submarines would not be allowed into the former's territorial waters. Hence, there is a political opposition to it
- **Upset France**: Australia had struck a deal with France for $90 billion worth of conventional submarines, which stands cancelled now. This has upset political leadership in France.
- **Upset New Zealand:** Criticized for not involving New Zealand, an important strategic ally in the Pacific region, possibly because of the country's nuclear-free policy
- **Battleground:** The Indo-Pacific region will emerge as the new geopolitical battle ground posing greater security risk to others.

International Atomic Energy Agency (IAEA):

- Widely known as the world's "Atoms for Peace and Development" organization within the United Nations family, the IAEA is the international centre for cooperation in the nuclear field.
- The IAEA was created in 1957 in response to the deep fears and expectations generated by the discoveries and diverse uses of nuclear technology.

	• **It reports annually to the United Nation General Assembly.** • **Headquarter: Vienna, Austria.** **Objectives and Functions:** • The Agency works with its Member States and multiple partners worldwide to promote safe, secure and peaceful use of nuclear technologies. • IAEA seeks to promote the peaceful use of nuclear energy and to inhibit its use for any military purpose, including nuclear weapons. • When necessary, the IAEA also reports to the UN Security Council in regards to instances of members' non-compliance with safeguards and security obligations. • In 2005, it was awarded the Nobel Peace Prize for their work for a safe and peaceful world.
NOPEC bill	**Context: The No Oil Producing and Exporting Cartels (NOPEC) bill,** which passed a Senate committee recently, is intended to protect U.S. consumers and businesses from engineered oil spikes. **About NOPEC bill:** • The bipartisan NOPEC bill would tweak U.S. antitrust law to revoke the sovereign immunity that has protected OPEC+ members and their national oil companies from lawsuits. • If signed into law, the U.S. attorney general would gain the option to sue the oil cartel or its members, such as Saudi Arabia, in federal court. • It is unclear exactly how a federal court could enforce judicial antitrust decisions against a foreign nation. • Previous versions of the NOPEC bill have failed amid resistance by oil industry groups, including the top U.S. oil lobby group, the American Petroleum Institute (API). **Concerns about the bill:** • One industry concern is that NOPEC legislation could ultimately lead to overproduction by OPEC, bringing prices so low that U.S. energy companies have difficulty boosting output. • Saudi Arabia and other OPEC countries have some of the world's cheapest and easiest reserves to produce. • A wave of oil from OPEC producers, even at a time of concerns about Russian supply could chill U.S. drillers, some of which are already reluctant to boost output despite the cut. • Some analysts have said that NOPEC could lead to unintended blowback, including the possibility that other countries could take similar action on the United States for withholding agricultural output to support domestic farming, for example. • OPEC nations could also strike back in other ways. • In 2019, for example, Saudi Arabia threatened to sell its oil in currencies other than the dollar if Washington passed a version of the NOPEC bill. • Doing so would undermine the dollar's status as the world's main reserve currency, reduce Washington's clout in global trade, and weaken its ability to enforce sanctions on nation-states.
U.N. Peacekeeping Forces	**Context:** U.N. Peacekeeping chief in an interview says that Troop- and police-contributing countries need to be very much in the loop and involved in the process of making decisions on peacekeeping, and have been making a lot of efforts to improve the geographical diversity of nations providing the forces. *This map shows 70 years of peacekeeping operations spanning across four continents.*

About UN Peacekeeping forces:

- The first time UN Peacekeeping Forces were first deployed was in 1948 when the UN Security Council authorized the deployment of UN military observers to the Middle East.

Three basic principles of UNPKF:

Consent of the parties:

- UN peacekeeping operations are deployed with the consent of the main parties to the conflict. This requires a commitment by the parties to a political process.

Impartiality:

- United Nations peacekeepers should be impartial in their dealings with the parties to the conflict, but not neutral in the execution of their mandate.

Non-use of force except in self-defence and defense of the mandate:

- UN peacekeeping operations are not an enforcement tool. However, they may use force at the tactical level, with the authorization of the Security Council, if acting in self-defence and defense of the mandate.
- UNPKF brings together the General Assembly, the Security Council, the Secretariat, troop and police contributors and the host governments in a combined effort to maintain international peace and security.
- The Security Council can vote to extend, amend, or end mission mandates as it deems appropriate.
- Currently there are 12 UN peacekeeping operations deployed on three continents.
- UNITED NATIONS MILITARY OBSERVER GROUP IN INDIA AND PAKISTAN (UNMOGIP) is deployed in Jammu & Kashmir to supervise the ceasefire between India and Pakistan on 24 January of 1949.

The UN Peacekeeping force is supplemented by personnel from member nations on a volunteer basis.

Department of Peace Operations (DPO):

- DPO provides political and executive direction to UN peacekeeping operations around the world and maintains contact with the Security Council, troop and financial contributors, and parties to the conflict in the implementation of Security Council mandates.
- **Women, Peace, and Security is a key commitment of the Action for Peacekeeping initiative.**
- Through UN Security Council resolution 1325, ensuing resolutions, as well as the **Action for Peacekeeping (A4P) Declaration of Shared Commitments**, the UN has called for an expansion of the role and contribution of women in its operations, including of uniformed women peacekeepers.
- **A4P has been signed by 152 Member States,** a number of which have come forward to specifically champion implementation of A4P's WPS commitment: Bangladesh, Canada, Finland, Germany, Ireland, Italy, Norway, South Africa, and the United Kingdom.

Exercise IBSAMAR	**Context:** INS Tarkash reached Port Gqeberha (also known as Port Elizabeth), South Africa to participate in the seventh edition of IBSAMAR. **Key details of the Exercise:** • It is a **joint multinational maritime exercise among Indian, Brazilian and South African Navies.** • It was initiated in 2008 • Ex IBSAMAR highlights the maritime dimension of the IBSA Dialogue Forum and the robust South-South cooperation. • The Indian Navy is represented by the Teg class guided missile frigate, INS Tarkash, a Chetak helicopter and the personnel from the Marine Commando Force (MARCOS).

	• The **harbour phase of IBSAMAR VII** includes professional exchanges such as damage control and fire-fighting drills, VBSS/cross boarding lectures and interaction among special forces. • The **Joint Maritime Exercise** will strengthen maritime security, joint operational training, sharing of best practices and building interoperability to address common maritime threats. **The IBSA Dialogue Forum:** • The **IBSA Dialogue Forum (India, Brazil, South Africa)** is an international tripartite grouping for promoting international cooperation among these countries. • It represents three important poles for galvanizing South–South cooperation. • The forum provides the three countries with a platform to engage in discussions for cooperation in the field of agriculture, trade, culture, and defense among others.
The International Migration Outlook Report 2022	**Context:** Indians, who represent the second largest cohort of international students in some of the world's most developed economies, are strongly overrepresented in **STEM (science, technology, engineering and mathematics)** subjects, particularly in engineering, according to The International Migration Outlook Report 2022. **Findings of the report:** • The 2022 edition of International Migration Outlook analyses recent developments in migration movements and the labour market inclusion of immigrants in OECD countries. • During 2017/18, nearly half of the international students in the USA were studying STEM subjects, and this share was around 79 per cent for Indian students, substantially more than the Chinese (45 per cent). • Germany reported three large groups of international students primarily enrolled in engineering fields in 2021 out of which Indian students constituted a total of 66 per cent surpassing Chinese students who accounted for a total of 50 per cent. • In 2016-17, more than half of the Indian students in the Netherlands were admitted to engineering degree programs. • Factors that Indian students take into consideration before moving abroad for higher education. • lower fees and a prospective job market. • geographical proximity, • the language of instruction, • policies regarding access to the labor market even during the course of study. • Therefore, countries like Australia, Norway, Germany, and Switzerland see an influx of Indian students.
Oslo Accords	**Context:** Spanish fast-fashion giant Zara has been facing calls for boycott in Israel, after a franchise owner hosted a far-right politician for a campaign event. Many Arab Israelis took to Twitter, where

they posted videos of themselves setting the company's clothes on fire with the hashtag **#boycottZara.**

About Oslo Accords:

- The Oslo Accords are a series of agreements that launched the Oslo Process, aimed at achieving a comprehensive peace treaty between **Israel and the Palestine Liberation Organization (PLO).**
- The Oslo Process was unveiled with the **signing of the Declaration of Principles (DOP)** by the PLO Chairman and Israeli Prime Minister in 1993.
- It was the first peace agreement signed by Israelis and Palestinians.
- The agreement did not directly address the key "permanent status" issues of water, refugees, Jerusalem, settlements and borders, but set up a structure for them to be negotiated at a later stage of the process, once trust was built.
- It also led to the creation of the Palestinian Authority (PA) as part of the 1995 Oslo Interim Agreement.
- After the failure of the Camp David (II) Summit in 2000 and the subsequent outbreak of the Second Intifada, the Oslo Process collapsed.

HISTORY AND ART & CULTURE

50 iconic Indian heritage textiles by UNESCO	**In News:** UNESCO released a list of 50 exclusive and iconic heritage textile crafts of India.

In News: UNESCO released a list of 50 exclusive and iconic heritage textile crafts of India.

- **Handmade for the 21st Century**: Safeguarding Traditional Indian Textile lists the histories and legends behind the textiles, describes the complicated and secret processes behind their making, mentions the causes for their dwindling popularity, and provides strategies for their preservation.

Some of the iconic handcrafted textiles documented:

Khes from Panipat: These were woven in a double-cloth weave with cotton yarn in a chickened design.

- The Khes was thick enough to be used more popularly as a bedding material, but also additionally as a shawl or a wrap.

Chamba Rumal from Himachal Pradesh

- An embroidered handicraft that was once promoted under the patronage of the former rulers of the Chamba kingdom.
- It is a common item of present during marriages with detailed patterns in bright colour schemes.
- This product has been registered for protection under the Geographical indication of the Trade Related Intellectual Property Rights (TRIPS) agreement

Thigma or wool tie and dye from Ladakh

- A resist tie-dye technique on wool – Thigma is similar to the technique of Bandhani.
- Crafted mainly in Nubra Valley, Ladakh the term Thigma is derived from the word "thitoo" or dot.
- The cloth is pinched, without any tools and the part to be resisted is tied tightly with thread.

Awadh Jamdani from Varanasi

- A cotton brocade characterized by floral patterns, jamdani is a light and translucent fabric.

Bandha tie and dye from Sambalpur in Odisha: A resist dyeing technique and a kind of ikat.

- Geographically tagged
- It is made through a process of tie-dying the warp and weft threads to create the design on the loom prior to weaving.
- Every colour used in the fabric reflects a symbolic concept of the Jagannath cult. These colours are said to denote the past, present, and future, to the Vedas and the Gods Garad-Koirial from West Bengal

Ilkal and Lambadi or Banjara embroidery from Karnataka

- The Lambani embroidery is an amalgam of pattern darning, mirror work, cross stitch, and overlaid and quilting stitches with borders of "Kangura" patchwork appliqué, done on loosely woven dark blue or red handloom base fabric.

Sikalnayakanpet Kalamkari from Thanjavur

- Thanjavur kalamkari features figurative drawings distinguished by black outlines and intricate borders.
- Owing to its figurative motifs, it is also known as chithira paddam (chithira refers to "picture" and one of the meanings of paddam is "trace").
- **Thanjavur kalamkari was first patronized by Sevappa Nayak, the first Nayaka ruler of Thanjavur.**

Toda embroidery and Sungadi from Tamil Nadu

- The **Toda Embroidery, also locally known as "Pukhoor",** is an art work among the Toda pastoral people of Nilgiris, in Tamil Nadu, made exclusively by their women.
- The embroidery, which has a fine finish, appears like a woven cloth but is made with the use of red and black threads with a white cotton cloth background.
- The embroidery is usually made on their cloaks called **"Pootkhuly"** which is draped by both women and men.

Himroo from Maharashtra

- Himroo is a fabric produced in Aurangabad from locally grown silk and cotton.
- Himroo is a replica of Kum-Khwab, which was made for the royal families in ancient times from strands of gold and silver.

Kunbi weaves from Goa: A type of dyed sari.

- It is a check red saree prominently dyed in red and its variants.

Mashru weaves and Patola from Gujarat

- Mashroo is a woven textile craft form with a purpose stemming from religion.
- '**Mashroo' meaning 'permitted'** in Arabic lends credibility to the textile since wearing pure silk was prohibited. The Mashroo method made it a fabric 'permitted by the sacred law of Islam'.

UNESCO's Intangible Cultural Heritage:

- Aim: Ensuring the better protection of important intangible cultural heritages worldwide and creating awareness of their significance.
- This list has been classified into five broad domains in which intangible cultural heritage is manifested:
  - Oral traditions and expressions, including language as a vehicle of the intangible cultural heritage
  - Performing arts
  - Social practices, rituals and festive events
  - Knowledge and practices concerning nature and the universe
  - Traditional craftsmanship

M K Gandhi

In news: Gandhi's Birth Anniversary was celebrated on October 2.

About Mahatma Gandhi:

- Mahatma Gandhi was born on October 2, 1869 as Mohandas Karamchand Gandhi to the dewan (chief minister) of Porbandar and Putlibai.
- He was an Indian lawyer, politician, social activist, and writer who led the national movement against British rule in India and South Africa.
- Rabindranath Tagore gave him the title **"Mahatma" and Subash Chandra Bose gave him the title "Father of the Nation".**
- In 1893, Gandhi went to South Africa for legal work and remained there for 21 years, fighting for Indian rights and defending indentured labour in low courts against racial discrimination.
- He founded Ashram settlement at Phoenix and Tolstoy farm towards leading a simple community life.
- During the Boer war and the Zulu rebellion he helped the Government at the hour of its need, by raising Indian Ambulance and Stretcher-bearer Corps which served close to the line of fire. Gandhi was awarded Kaiser-i-hind for this service.
- He founded the **Natal Indian congress 1894**. The British Indian committee in the Transvaal fought against restriction on Indian trade, movement and residence. During the **campaign against the 'Black' Registration Act,** Gandhi lit a grand bonfire of thousands of the registration certificates.

Contribution to National Movement:

	Champaran Movement (1917) in Bihar under the strategy of civil disobedience was led by Gandhi to make Britishers agree to the demand of farmers, who were forcefully made to grow Indigo. He signed an agreement in which Britishers granted control and compensations to the farmers, and cancelled the hikes in revenue and collection. **Kheda Movement (1918)** in Gujarat was led by Gandhi towards non-payment of taxes and involved social boycott of the revenue officials. **Ahmedabad Mill Strike (1918)** in Gujarat led by Gandhi against owners of mill on the issue of plague bonus and workers ended up getting a 35% wage increase. **Khilafat Movement (1919)**: Gandhi had a major influence on the Muslim population and helped in uniting the country at the time of crisis, when Britishers tried their best to divide the nation on religious grounds. Gandhi participated actively in the movement, and became a prominent spokesperson for the All-India Muslim Conference. **Non-cooperation Movement (1920)**: He convinced people that non-cooperation was the key to Independence. He also set the goal of Swaraj or self-governance. **Unity' Fast (1924)**: Gandhi imposed on himself a 21-day fast to end Hindu-Muslim tension. **Dandi March (1929) or Satyagraha campaign** against the salt tax was led by Gandhi where he marched 388 kilometers from Ahmedabad to Dandi in Gujarat to make salt. This led to the beginning of the civil disobedience movement that lasted till 1934. **Quit India Movement (1942)** was led by Gandhi in 1942 with the slogan of "Do or Die" against British rule and India's involvement in World War II.
Lal Bahadur Shastri	**In News:** Marking Lal Bahadur Shastri's birth anniversary, Prime Minister of India and President of India paid tributes to the former PM at Vijay Ghat. - Lal Bahadur Shastri was the 2nd Prime Minister of India from 1964 to 1966 and 6th Home Minister of India from 1961 to 1963. He was also the railways minister (1951–56). - He was born on 2 October 1904 and left his education to join the non-cooperation movement. - He worked for the betterment of the Harijans at Muzaffarpur and dropped his caste-derived surname of "Srivastava". - Shastri's thoughts were **influenced by Swami Vivekananda, Mahatma Gandhi and Annie Besant.** - He served as the president of **Servants of the People Society (Lok Sevak Mandal)**, founded by Lala Lajpat Rai and held prominent positions in the Indian National Congress. - He promoted the **White Revolution** by supporting the Amul milk co-operative of Anand, Gujarat and creating the National Dairy Development Board. - He also promoted the **Green Revolution in India in 1965.** This led to an increase in food grain production, especially in the states of Punjab, Haryana and Uttar Pradesh. - He won great popularity for his firmness on the outbreak of hostilities with neighboring Pakistan (1965) over the disputed Kashmir region. - He died of a heart attack after signing a "no-war" agreement with Pres. Ayyub Khan of Pakistan was succeeded as prime minister by Indira Gandhi.
International Day of Non-Violence	**In News:** India's Permanent Mission to the United Nations and UNESCO Mahatma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP), organized a panel discussion to commemorate the International Day of Non-Violence. **About:** **Iranian Nobel Laureate Shirin Ebadi**, in January 2004, first proposed the idea of dedicating a day to non-violence, around the world. - On June 15, 2007, the United Nations General Assembly (UNGA) passed a resolution to commemorate October 2 as the International Day of Non-Violence, with the core

	objective to **"disseminate the message of non-violence, tolerance, respect for diversity, human rights and fundamental freedoms through education and public awareness."** • A dialogue with the hologram was envisioned in 2019, and was curated by Birad Rajaram Yagnik, director of the Mahatma Gandhi Digital Museum in Hyderabad. This dialogue focused on raising awareness on the future of education and SDG 4 (to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all). **About the hologram:** • A hologram refers to a **"three-dimensional image formed by the interference of light beams from a laser or other coherent light source."** • The holography, aimed at bringing written works of Gandhi into **"a life-like scenario",** covered the leader's writings on Satyagraha, non-violence (Ahimsa), kindness, critical inquiry and education. • **Reprography refers to the reproduction and duplication of documents, written materials, drawings, designs, etc., by any process making use of light rays or photographic means, including offset printing, microfilming, photography.** **Meaning of non-violence:** • **Non-violence," according to Gandhi, "is mightier than the mightiest weapon of destruction devised by the ingenuity of man".** • The United Nations defines the term as a rejection of the **"use of physical violence in order to achieve social or political change."**
Shyamji Krishna Varma	**In news:** The Prime Minister has paid tributes to Shyamji Krishna Varma on his Jayanti. **About Shyamji Krishna Varma:** • Born in 1857 in modern-day Gujarat, Shyamji Krishna Varma completed his education in India, before moving on to teach Sanskrit at the Oxford University. • In 1905 he founded the "India House" which acted as one of the most prominent centres for revolutionary Indian nationalism outside India. • He also founded the monthly journal **"The Indian Sociologist"** which became an outlet for nationalist ideas and through the Indian Home Rule Society, he criticized the British rule in India. • On 18 February 1905, Shyamji inaugurated a new organization called **"The Indian Home Rule Society"** with the object of securing Home Rule for India. • **Varma became the first President of Bombay Arya Samaj.** • He was an **admirer of Dayanand Saraswati,** and **he inspired Veer Savarkar who was a member of India House in London.** • A memorial called Kranti Teertha dedicated to him was inaugurated in 2010 near Mandvi, Kutch, Gujarat.
Chola Dynasty	**Context:** A recently released film Ponniyin Selvan has focused on a fictional account of the 10th-century Chola dynasty. Cholas are known for their progressiveness, the architectural marvels and temples, the social setup of the time, and how cities were named after women.
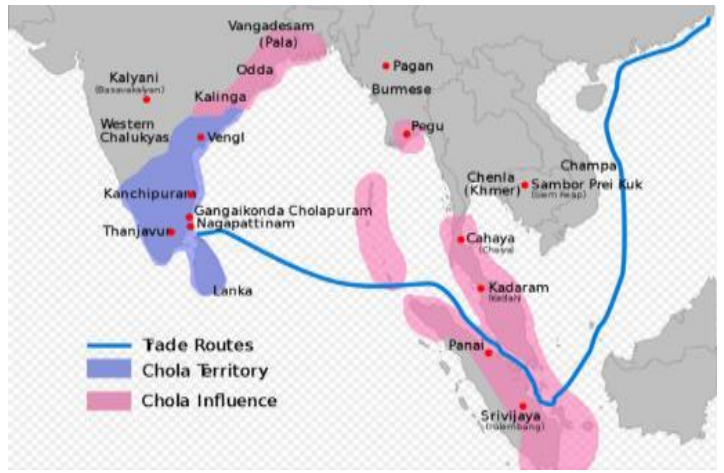
The era of the Cholas:

Region of power:

- The Chola kingdom stretched across present-day Tamil Nadu, Kerala, and parts of Andhra Pradesh and Karnataka.
- It is one of the longest-ruling dynasties in world history.

Geographical extent:

- The heartland of the Cholas was the fertile valley of the Kaveri River.
- They unified peninsular India, south of the Tungabhadra, and held it as one state for three centuries.
- The Chola territories stretched from the Maldives in the south to the banks of the Godavari River in Andhra Pradesh as the northern limit.

Capital and important centres:

- Their early capital was at Thanjavur and later on at Gangaikonda Cholapuram.
- Kanchipuram and Madurai were considered to be regional capitals in which occasional courts were held.

Foundation of the dynasty:

- The dynasty was founded by king Vijaylaya, described as a "feudatory" of the Pallavas.

Contemporaries of Cholas:

- As **one of the Three Crowned Kings of Tamilakam,** along with the Chera and Pandya, the dynasty continued to govern over varying territories until the 13th century CE.
- During the period of the Cholas (around the 9th to 12th century AD), other powerful dynasties of the region would also come and go, such as
- The **Rashtrakutas of the Deccan** who defeated the Cholas and the **Chalukyas of the Andhra Pradesh** region whom the Cholas frequently battled.

Society under the Cholas:

Agriculture & canals:

- There was tremendous agrarian expansion during the rule of the imperial Chola Dynasty all over Tamil Nadu and particularly in the Kaveri Basin.
- Most of the canals of the Kaveri River belong to this period.

Trade:

- While the extent of this domination is disputed, the Cholas had strong ties with merchant groups and this allowed them to undertake impressive naval expeditions.

A strong army and navy:

- One of the biggest achievements of the Chola dynasty was its naval power, allowing them to go as far as Malaysia and the Sumatra islands of Indonesia in their conquests.
- The domination was such that the Bay of Bengal was converted into a "Chola Lake" for some time.
- The dynasty became a military, economic and cultural powerhouse in South Asia and South-East Asia.
- Maintaining a strong army and naval resources made sense for the Cholas, because the period from 9th to 10th century was a violent time, where kingdoms would go to war with each other frequently.

Art & Culture:

Example of the many frescoes found in the pillared coloister that surround the courtyard of the Big Temple in Thanjavur, India.

Temple architecture:

- The Cholas built their temples in the traditional way of the Pallava dynasty, who were themselves **influenced by the Amaravati school of architecture.**
- The maturity and grandeur to which the Chola architecture had evolved found expression in the **two magnificent temples of Thanjavur and Gangaikonda Cholapuram.**

Brihadeeswara temple:

- The grand Brihadeeswara temple of Thanjavur, built by the Cholas, was the largest building in India in that period.
- This temple carries on its walls the engraved evidence of the elaborate administrative and financial procedures concerning the day-to-day administration of the temple.

Airavateswara temple:

- The **Airavateswara temple at Darasuram near Thanjavur built during the reign of Rajaraja II** is a magnificent structure typical of the stage of architectural development reached in the 12th century CE.

Sculptures:

- The Chola period is also remarkable for its sculptures and bronzes.
- Artworks and sculptures were commissioned by Chola kings and queens, including the famous bronze Nataraja idols.
- Chola period bronzes were created using the **lost wax technique.**
- Earlier, the Rashtrakutas had built the Kailasanatha temple in Maharashtra's Aurangabad — the largest monolith structure (carved from a single rock) of its time.

Blots in the Chola history:

- The Chola rulers sacked and plundered Chalukyan cities including Kalyani and massacred the people, including Brahmans and children.
- They destroyed Anuradhapura, the ancient capital of the rulers of Sri Lanka.

Begum Samru	**Context:** The Basilica of Our Lady of Graces, one of India's minor basilicas situated in Sardhana in Uttar Pradesh, was constructed in 1822 by Begum Samru, a woman of humble origins that came to be popularly known as the only Catholic queen of India. **About Begum Samru:** - Begum Samru (1750's – 1836) was a Muslim who converted to Catholicism. - She was a **nautch-girl (dancing girl)** who became a warrior and an aristocrat. - She was a shrewd leader who was able to find a favourable position in the ever-dynamic political terrain of 18th century northern India. - While she had first supported the waning Mughal empire, from the 1790's the Begum began to provide service to the rising Marathas, before joining the British to ensure that she could maintain her landholding rights if they emerged victorious. **The Basilica of Our Lady of Graces:** - It is **one of the 23 minor basilicas of India, and the only one in the north,** after the church was bestowed the status by Pope John XXIII in 1961. - The architect was an **Italian engineer, Antonio Reghellini.** - Completed in 1822, it is commonly believed that the church was built as a replica of St Peter's Basilica in Rome. - The structure consists of a blend of architectural styles, of Indian and Islamic features added to a European cross-plan church. - The church's domes lie next to large steeples reminiscent of Islamic minarets, while the central altar contains pietra dura or parchinkari designs that are found in the Taj Mahal and Red Fort.

Modhera Sun Temple	**Context:** Prime Minister of India recently witnessed the 3D light and sound show explaining the importance of the centuries-old Sun temple built during the Chalukya dynasty.

About Sun Temple at Modhera:

- It was built in 1026-27 CE during the reign of Bhima I of the Solanki dynasty and is a protected monument maintained by the Archaeological Survey of India.
- The temple complex is divided into three components:
    o Gudhamandapa, the shrine hall,
    o Sabhamandapa, the assembly hall and
    o Kunda, the reservoir.
- The temple is suspected to have been built to commemorate the **defense of Modhera by Bhima I against Mahmud of Ghazni.**
- The temple complex is built in **Maru-Gurjara style also known as Solanki style.**
- The exclusively carved temple complex and the magnificently sculpted kund are jewels in the art of masonry of the **Solanki period apparently which was also known as the Golden Age of Gujarat**.

Modheshwari Mata Temple:

- The temple is located near the ruins of the famous Sun Temple, where another original place of worship is situated below the step-well.
- This temple is very famous amongst the **Modh clan of Gujarat as Goddess Modheshwari is considered as the deity of the Modh clan.**
- The Goddess Modheshwari is believed to be a form of Goddess Parvati and is known for having 18 arms with each arm carrying various weapons to protect the clan from danger.

Other Important Sun Temples in India:

- Sun Temple at Konark, Odisha
- Martand Sun temple, Kashmir
- Katarmal Sun Temple, Uttarakhand
- Dakshinarkaa temple Gaya, Bihar
- Bhramanya temple, Unao, Madhya Pradesh
- Surya Prahaar temple, Assam
- Suryanar Kovil Temple at Kumbakonam in Tamil Nadu
- Suryanarayana temple at Arasavalli, Andhra Pradesh

Culture track	**In News**: Hampi, Khajuraho on list for G20 culture track.

- As part of India's G20 Presidency between December 2022 and November 2023, the Government is planning to host five key meetings focusing on the "culture track" at Khajuraho, Bhubaneswar, Hampi and Agra.
- These cities have been chosen mainly for well-known monuments and **UNESCO World Heritage Sites such as Taj Mahal and Agra Fort (UP), the Hindu and Jain temples of Khajuraho (Madhya Pradesh), the Konark Sun Temple around 65 km from Bhubaneswar (Odisha), and the sites at Hampi (Karnataka).**

UNESCO World Heritage Site:

- A World Heritage Site is a place that is listed by UNESCO for its special cultural or physical significance.
- The list of World Heritage Sites is maintained by the international '**World Heritage Programme', administered by the UNESCO World Heritage Committee.**
- There are **40 UNESCO World Heritage Sites in India.**

- **Dholavira and Ramappa Temple** are the latest additions to the list under the 'Cultural' category. There are two more categories — Natural and Mixed.

Agra Fort (declared in 1983):

- 16th-century Mughal monument
- Fortress of red sandstone
- It comprises the **Jahangir Palace and the Khas Mahal, built by Shah Jahan**; **audience halls**, such as the **Diwan-i-Khas**.

Taj Mahal:

- The **Taj Mahal (Agra) is a mausoleum of white marble** built by the Mughal emperor, **Shahjahan in memory of his wife Mumtaz Mahal**. It stands on the banks of the river Yamuna.
- The Taj Mahal was declared a centrally protected monument of national importance in December 1920.
- Considered as one of the **Seven Wonders of the World,** it was inscribed on the list of World Heritage Sites in 1983.

Group of Monuments at Hampi (1986)

- This site was the last capital of the Vijayanagar Kingdom.
- These Dravidian temples and palaces were built by rulers of Vijayanagara between the 14th and 16th centuries.
- In 1565, the city was captured by **Deccan Muslim Confederacy** and pillaged for a period of 6 months, before being abandoned.

Khajuraho Group of Monuments (1986)

- These temples were built during the **Chandela dynasty**, which reached its pinnacle between 950 and 1050.
- Only 20 temples remain, belonging to two different religions namely-**Hinduism and Jainism**, including the famous Temple of Kendriya decorated with intricately and beautifully carved sculptures.

Konark Sun Temple in Odisha (1984)

- Built in the 13th century, the Konark temple was conceived as a gigantic chariot of the Sun God, with 12 pairs of exquisitely ornamented wheels pulled by seven horses.
- It was built **by King Narasimhadeva I, the great ruler of the Ganga dynasty**.
- The temple is a perfect blend of Kalinga architecture, heritage, exotic beach and salient natural beauty.

| **National Maritime Heritage Complex** | **In news:** Prime Minister reviewed the construction of the National Maritime Heritage Complex (NMHC) site at Gujarat's Lothal. |

- The project began in 2022.

About Lothal:

- Lothal was one of the southernmost sites of the Indus Valley civilization, located in the Bhāl region of what is now the state of Gujarat.
- The meaning of **Lothal (a combination of Loth and (s) thal)** in Gujarati is **"the mound of the dead".**
- It is believed to have been built in 2,200 BC.

- Lothal was not only a major trading centre of the Indus Valley Civilisation, but it was also a symbol of India's maritime power and prosperity. Its trade of beads, gems and ornaments reached West Asia and Africa.
- **Archaeologist SR Rao led the team which discovered Lothal.**
- Lothal had the **world's earliest known dockyard**, connecting the city to an **ancient course of the Sabarmati River.**
- A metropolis with an upper and a lower town had in on its northern side a basin with vertical wall, inlet and outlet channels which has been identified as a tidal dockyard.
- The **National Institute of Oceanography** in **Goa** discovered marine microfossils and salt, gypsum crystals at the site, indicating that sea water once filled the structure.

Significance:
- Lothal was nominated as a UNESCO World Heritage Site, and its application is **pending on the tentative list of UNESCO.**
- Lothal is the only port-town of the Indus Valley Civilisation.
- The river channel, now dried, would have brought in considerable volume of water during high tide, which would have filled the basin and facilitated sailing of boats upstream.
- Its heritage value is comparable to other ancient port-towns around the world – including **Xel Ha (Peru), Ostia (Port of Rome) and Carthage (Port of Tunis) in Italy, Hepu in China, Canopus in Egypt, Gabel (Byblos of the Phoenicians), Jaffa in Israel, Ur in Mesopotamia, Hoi An in Vietnam, Balakot (Pakistan), Khirasa (in Gujarat's Kutch) and Kuntasi (in Rajkot).**

Bronze idols	**In News**: The Idol Wing-CID has traced two Chola-era bronze idols that were stolen about 50 years ago from the **Vishwanatha Swamy Temple at Alathur in Tiruvarur district and smuggled to the United States.** - Three antique metal idols — Vishnu, Sridevi and Bhudevi belonging to the Vishwanatha Swamy Temple — had been burgled. - The Idol Wing traced the idols of Yoganarasimha and Ganesha, Somaskandar idol and the Dancing Sambandar idol. **Indian Bronze Sculptures:** • The process of making alloy of metals by mixing **copper, zinc and tin is called bronze.** • The '**Dancing Girl' from Mohenjodaro is the earliest bronze sculpture dated to 2500 BCE**. • At Daimabad (Maharashtra) dating to 1500 BCE, bronze 'Chariot' has been discovered. - They are cast through **cire-perdue or 'lost-wax' process**. - First a wax model of the image is **made by hand of pure beeswax**. - It is then pressed through a pichki or pharni — which squeezes the wax into noodle-like shape. - These wax wires are then wound around to the shape of the entire image. The image is now covered with a thick coating of paste, made of equal parts of clay, sand and cow-dung. - Into an opening on one side, a clay pot is fixed. In this molten metal is poured.

	• While the molten metal is poured in the clay pot, the clay-plastered model is exposed to firing. As the wax inside melts, the metal flows down the channel and takes on the shape of the wax image.
	• The image is later chiselled with files to smoothen it and give it a finish.
	• Sometimes an alloy of five metals — **gold, silver, copper, brass and lead — is used to cast bronze images.**
Samburu warriors rock art	**In News:** Linnaeus University in Sweden and the University of Western Australia initiated a community-led project together with the Samburu to learn about their rock art tradition. • The Samburu people in **northern Kenya's Marsabit county are pastoralists.** • They migrate from place to place in search of pasture and water for their cattle, goats, sheep and camels. • As part of their lifestyle, at the age of 15, Samburu boys leave their villages and go through initiation rituals when they live in rock shelters, which mark the passing from childhood to warriorhood and learn about their protective duties. • During this time the young warriors — **called lmurran — express themselves by painting images on the rocks.** • **Samburu rock art tradition commemorates real-life events** related to the warrior life-world. **About Samburu art:** • The images are made using **red, white, yellow and black paint.** • The white colour was animal fat, which turns light when it dries. To make black paint they used charcoal. • As a binder, all pigments were mixed with fat from slaughtered animals. • Today, commercial paint is also used along with more traditional \ • The images become an **inter-generational visual culture that reflects and recreates a warrior identity and lifestyle.** • The artists always have specific people, animals and objects in mind when making their drawings. This is not clearly expressed in the drawings as they lack identifying details. • Studying the images doesn't reveal the artist's intention. Many of the artworks reflect first hand experiences of the warriors. A bull figure, for example, depicts a bull they slaughtered and ate.
Bhoota Kola	**Context:** Several complaints were filed in Karnataka over statements on a cultural practice called Bhoota kola depicted in the film Kantara. • Bhoota Kola is an annual ritual performance where local spirits or deities are worshiped. • It is believed that a person performing the ritual has temporarily become a god himself. • This performer is both feared and respected in the community and is believed to give answers to people's problems, on behalf of the god. • There are several **'Bhootas'** who are worshiped in the **Tulu-speaking belt of Dakshina Kannada, Uttara Kannada and Udupi districts.** • It is usually performed in small local communities and rural areas.

	- As per Tulu Adivasi tradition, **Bhoota Kola or Daiva Kola is a "non-Vedic" ritual where Bhootas or Daivas (guardians and ancestors)** are worshiped. - Idols representing 'bhoothas' are taken out in a procession to the beating of drums and bursting of firecrackers, - It is widely believed these spirits protect the village from unfortunate incidents. - The dancing and pooja ritual is accompanied by drums and music. - The performer carrying a sword and jingling bells imitates the 'devil'.
Saka Panja Sahib	**Context:** The gurdwara management bodies from both sides of the border — Amritsar-based **Shiromani Gurdwara Parbandhak Committee (SGPC) and Pakistan Sikh Gurdwara Parbandhak Committee (PSGPC)** will jointly observe the centenary of Shaheedi Saka Panja Sahib (martyrdom massacre), at Hasan Abdal city of Attock district, Punjab province of Pakistan. **About Saka Panja Sahib:** - On October 30, 1922 two Sikhs died and several other Sikh protesters, including women, were injured at Hasan Abdal railway station after the railway authorities under the then-British government had refused to stop the train ferrying Sikh prisoners from Amritsar to Attock. - **The Sikhs from nearby Panja Sahib wanted to serve langar (community kitchen food)** to the Sikh prisoners but were told by the station master that the train would not stop at the station. - In protest, the Sikhs squatted on the railway tracks and as the train approached, the Sikhs, who were determined to halt the train, continued to stay put, demanding their right to serve langar to the Sikh prisoners. - The train finally came to a screeching halt, but only after crushing many of Sikh protesters — of whom Bhai Karam Singh and Bhai Partap Singh died after sustaining serious injuries. - Since then, both Sikhs are hailed as martyrs of Saka Panja Sahib who sacrificed their lives fighting for rights of Sikhs against the British. **About Gurdwara Panja Sahib:** - The Gurdwara Panja Sahib, in Hasan Abdal of Pakistan was built on the site believed to be visited by Sikhism's founder Guru Nanak Dev, along with his companion Bhai Mardana. - It is believed that a local saint Wali Qandhari was rude towards Nanak and refused to give water to Bhai Mardana who was extremely thirsty, from a natural fountain near his dera. - He also threw a boulder towards Nanak, but Nanak stopped it with his panja (hand) and a spring of water appeared there miraculously. - The boulder with Nanak's handprint is still there. - Later Maharaja Ranjit Singh and his general Hari Singh Nalwa got the gurdwara building constructed to commemorate Nanak's visit.
Mangarh Dham	**Context:** The Prime Minister of India will pay tribute to the unsung heroes of the Bhil tribal community, during his visit to the Mangarh Dham in Rajasthan's Banswara district. **About Mangarh Dham:** - Mangarh Dham is known for the massacre of tribals that took place **six years before Jallianwalla Bagh** and is sometimes referred to as the **"Adivasi Jallianwala".** - British forces **killed hundreds of Bhil tribals** on November 17, 1913, in the hills of Mangarh on the border of Rajasthan and Gujarat. - It is located in the **district on the Gujarat-Rajasthan border, a region with a large tribal population.** - Social reformer Govind Guru led the gathering of tribals and forest dwellers in 1913 in Mangarh against the British Raj. **About Bhils Tribal group:**

	• The word Bhil is derived from "Veel", which means "bow" in the Dravidian language. • The Bhil tribe is called "**Dhanush Purush of India**" because they are highly adept at learning Dhanush. • Bhils are a group of tribal Indians scattered throughout India from Gujarat in the west to Tripura in the Far East. • As of 2013, they were the largest tribal group in India with the majority living in the states of Gujarat, Madhya Pradesh, Rajasthan and Chhattisgarh. • Bhils have a rich and unique culture. The Bhilala subdivision is known for its Pithora painting. • **Ghoomar is a traditional folk dance of the Bhil tribe and symbol of femininity.**
Chhath Puja 2022	**About:** • **Chhath Puja is also known as Pratihar, Dala Chhath, Chhathi and Surya Shashthi.** • It is an ancient Hindu Vedic festival, dedicated to the solar deity Surya and Shashthi Devi. • It is primarily observed in the states of Bihar, Jharkhand and Uttar Pradesh and even in Nepal for thanking the gods for bestowing life on earth. • **The worshiping of the Sun God spans four days.** • First day of Chhath is known as **Nahay Khay.** The holy dip in a water body, especially in the river Ganga, is taken on this day. **Women who observe Chhath take only a single meal on this day.** • Second day of Chhath is known as **Kharna where dry fasting, without water, is observed from sunrise to sunset**. The fast is broken just after sunset after making a food offering to the Sun God. • Third day fasting **begins after having Prasad on the second day**. • **Parana is done on the next day after sunrise.** • **The festival does not involve idolatry**. Devotees believe that the main sources of the sun's powers are his wives, Usha and Pratyusha. • **The festival finds a mention in both epics, Ramayana and Mahabharata. In Ramayana, it is said that Sita performed Surya Shashthi or Chhath Puja on the day Ramrajya was established, whereas in Mahabharata, the puja was performed by Kunti (mother of the Pandavas) after they escaped from Lakshagrih, on the banks on Ganga.**

GEOGRAPHY

Nord Stream pipeline	**In News**: Sweden discovered the fourth leak in the two damaged offshore pipelines that comprise the crucial Nord Stream pipelines (Nord Stream 1 and Nord Stream 2). Two other leaks were found near Denmark earlier this week, Reuters reported.

About Nord stream:
- It is a pair of 2 offshore natural gas pipelines that runs across the Baltic Sea from Russia to Germany.
- Nord Stream 1 was completed in 2011 and runs from Vyborg in Russia to Lubmin near Greifswald, Germany.
- Nord Stream 2 runs from Ust-Luga in Leningrad to Lubmin Germany and was completed in September 2021. It has the capacity to handle 55 billion cubic meters of gas per year.
- The twin pipelines together can transport a combined total of 110 billion cubic meters of gas a year to Europe for at least 50 years.
- The Nord Stream crosses the Exclusive Economic Zones (EEZs) of several countries including Russia, Finland, Sweden, Denmark and Germany, and the territorial waters of Russia, Denmark, and Germany. In Germany, the pipeline connects to the OPAL (Baltic Sea Pipeline) and NEL (North European Pipeline) which further connects to the European grid.

Significance:
- Russia has the largest natural gas reserves in the world and around 40% of its budget comes from sales of gas and oil.
- Nord Stream 2 eliminates the risks related with sending gas through transit countries, cuts operating costs by doing away with transit fees and gives direct access to its most important European customer, Germany.
- It increases Europe's dependence on Russia (around 40% of its gas comes from Russia) while giving it a reliable customer. Germany is Russia's biggest European gas consumer, and most of it comes through the Nord Stream.

Cotton production in India	**Context:** October 7 is celebrated each year as World Cotton Day. Year 2022 marks the third-anniversary celebration of the international event with the theme Weaving a better future for Cotton.

- No less than 6 million small-to-medium-sized Indian cotton farmers and farm workers participate in the global cotton value chain.

Voluntary Sustainability Standards (VSS):
- The global textile supply chain is undergoing a paradigm shift as it pursues environmental and social upgradation to meet the sustainability requirements imposed by global textile and home furnishing retailers.

- This is being accomplished by using **Voluntary Sustainability Standards (VSS)**, which encapsulate certification schemes, labelling programmes, and private standards.
- The major VSS that are dominant in the sustainable cotton value chain today include **Better Cotton Initiative (BCI), Organic Cotton, Fairtrade Cotton, and Cotton Made in Africa.**

Dual benefits for India adopting VSS:

- On the one hand, it will help it remain globally competitive in the cotton supply chain and strengthen its position in the export market, while on the other, it will help meet India's SDG commitments.
- The total cotton area under VSS has reached 1.5 million hectares, contributing to 24 percent of the global VSS cotton area.
- With approximately 0.2 million hectares of area for production, it is the largest producer of organic cotton, accounting for 50 percent of global organic cotton production, and the second-largest producer of 'Better Cotton', accounting for 16.5 percent of total Better Cotton production covering an area of 1.5 million hectares.
- This clearly indicates that VSS cotton growth story in India has already demonstrated its contribution towards the achievement of SDG targets for Zero Hunger (Goal 2), Clean Water and Sanitation (Goal 6), Responsible Consumption and Production (Goal 12), Life on Land (Goal 15), and Climate Action (Goal 16).
- VSS cotton delivers real, measurable outcomes according to priority indicators such as changes in the extent of water bodies, improving groundwater withdrawal against availability, and rationalizing nitrogen fertilizer as outlined by NITI Aayog which maps India's SDG goals.

Cotton production in India:

- **India is the largest producer of cotton in the world** and **the third largest exporter. It is also the largest consumer of cotton in the world.**
- Top Cotton Producing States in India are Gujarat, Maharashtra. Telangana, Andhra Pradesh.
- India is the country to grow **all four species of cultivated cotton G.arboreum and Herbaceum (Asian cotton), G.barbadense (Egyptian cotton) and G. hirsutum (American Upland cotton).**
- **Hirsutum represents 94% of the hybrid cotton production in India** and all the current Bt cotton hybrids are G. hirsutum.
- Now India's Cotton would be known as '**Kasturi Cotton'** in the world cotton Trade.
- The pest-resistant **Genetically Modified (GM) Bt cotton hybrids** have captured the Indian market (covering over 95% of the area under cotton) since their introduction in 2002.

About Cotton Crop:

- It is **a Kharif Crop** that comes from the natural fibres of cotton plants, which are native to tropical and subtropical regions.
- The top five cotton producing countries are **China, India, the United States of America, Brazil and Pakistan,** which together account for more than three-quarters of global production.
- **Cotton plants** have a large growing period which can **extend up to 200 days**. Growing cotton starts between **December and March**. These plants require a **relatively high temperature (21-30°C)** over a long growing season.
- The cotton is not a thirsty crop as it is a **xerophyte**, which can grow in dry, arid environments.

| India's coal mines | **Context:** According to analysis by Global Energy Monitor (GEM), a firm that tracks utilization of the fuel-source internationally – on average India's coal mines use only two thirds of the capacity with some large ones using only 1 percent. |

About Coal in India:

- **India is the second largest producer and consumer of coal after China.**
- **Jharkhand is the largest coal-producing state in India.**
- The top coal-producing states include Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, Telangana and Maharashtra.
- Coal accounts for approximately 55% of the country's energy needs compared to other energy sources.

COAL MINES OF INDIA

Types of Coal:

Anthracite:

- Anthracite is the best quality of coal which carries 80 to 95 percent carbon content.
- It ignites slowly with a blue flame and has the highest calorific value.
- It is found in small quantities in Jammu and Kashmir.

Bituminous:

- Bituminous carries 60 to 80 percent of carbon content and a low level of moisture content.
- It is widely used and has high calorific value.
- It is found in Jharkhand, West Bengal, Odisha, Chhattisgarh and Madhya Pradesh.

Lignite:

- Lignite is often brown in colour. It carries 40 to 55 percent carbon content.
- It is an intermediate stage which happens during the alteration of woody matter into coal.
- It has high moisture content, so it gives smoke when burnt.
- It is found in Rajasthan, Lakhimpur (Assam), and Tamil Nadu.

Peat:

- Peat has less than 40 per cent carbon content.
- It is in the first stage of transformation from wood to coal.
- It has low calorific value and burns like wood.

About Global Energy Monitor:

- In 2007, responding to a call to action by climate scientist James Hansen, an informal group of journalists and environmental advocates began documenting 151 proposed coal plants in the United States which eventually became Global Energy Monitor.
- Global Energy Monitor was founded on principles of transparency and accountability.
- In 2014, GEM released the Global Coal Plant Tracker, an interactive database cataloguing thousands of coal-fired plants in all stages of development.
- GEM's team consists of researchers from around the world whose work enhances public understanding of the global energy system.
- Global Energy Monitor is a mission-driven Non-Profit organization. A majority of funding comes in the form of charitable donations from foundations and individuals.

Eclipses	**Context:** The partial solar eclipse or Surya Grahan on October 25 marks the last solar eclipse of the year. The eclipse will be visible from parts of Europe, Northern Africa and large parts of western and central Asia. Most of India should be able to view the solar eclipse, apart from some parts in the Northeast.

About Eclipses:

- An eclipse happens when a planet or a moon gets in the way of the sun's light.
- When the light of the Sun or the Moon is blocked by another body, the sun or Moon is said to be in eclipse.
- Here on Earth, we can experience two kinds of eclipses: solar eclipses and lunar eclipses.

Solar Eclipse:

- Also known as the eclipse of the sun, it occurs when the moon comes in between the sun and the earth. As a result, the moon blocks the light of the sun from reaching the earth's surface and casts a shadow on it.
- This occurs on a new moon phase.
- We can observe up to 5 solar eclipses per year.
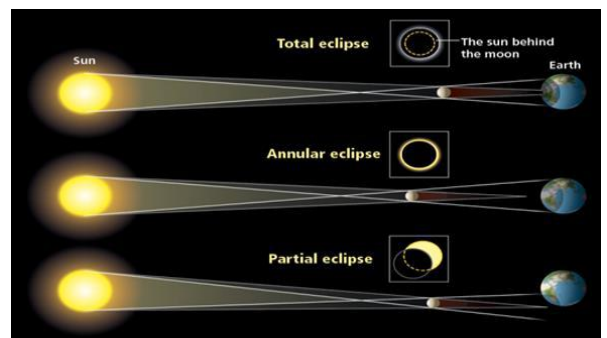
Type of Solar Eclipses:

- Eclipses may be classified into 4 types i.e., **Annular, Total, Partial and Hybrid**.
- The type of eclipse we experience depends on the type of shadow that is involved.
  - Both the Moon and Earth cast 3 shadows: umbra, penumbra, and an antumbra.
  - The umbra is a shadow's dark core: It means If you are standing within the umbra, you will not be able to see any part of the light source as the object blocks all direct light rays.

  - The penumbra is a half-shadow that occurs when a light source is only partly covered by an object
  - Antumbra – the lighter part of the shadow that begins where the umbra ends.
- **Total Eclipse:** This occurs when the Sun is completely obscured from the rich. Instead, the Sun's intense light is replaced by the dark silhouette of the Moon that is outlined by the Sun's corona (the super-heated plasma extending out from the Sun.
- **Annular Eclipse:** Occurs when the Sun and Moon are exactly in line but Moon appears smaller than the Sun. During one annular eclipse, the Sun appears as a bright ring around the Moon.
- **Partial Eclipse:** Occurs when the Sun and Moon are not completely aligned and the Sun is partially obscured.
- **Hybrid Eclipse:** Hybrid Eclipse is a combination of total and annular eclipse that takes place when a total eclipse changes to an annular eclipse or vice-versa along different sections of the eclipse's path.
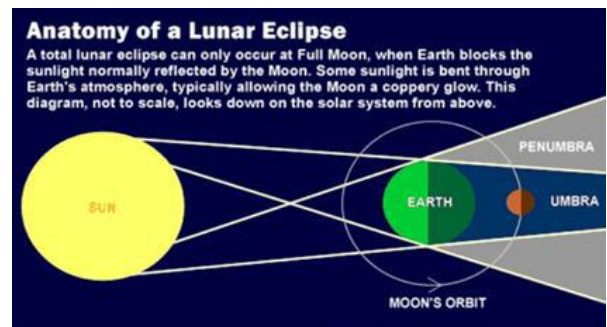
Lunar Eclipse:

- A lunar eclipse occurs when the Moon moves into the Earth's shadow.
- This can occur only when the Sun, Earth, and Moon are exactly or very closely aligned with Earth between the other two, which can happen only on the night of a full moon when the moon is near either lunar node.

There are 3 kinds of lunar eclipses:

- A total lunar eclipse occurs when Earth's umbra – the central, dark part of its shadow – obscures all of the Moon's surface.
- A partial lunar eclipse can be observed when only part of the Moon's surface is obscured by Earth's umbra.
- A penumbral lunar eclipse happens when the Moon travels through the faint penumbral portion of Earth's shadow.
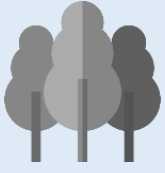
ENVIRONMENT

Uttar Pradesh plans its 4th tiger reserve in Bundelkhand	**Context:** The Uttar Pradesh (UP) cabinet recently approved the notification of the state's fourth tiger reserve in the Ranipur Wildlife Sanctuary (RWS) in Chitrakoot district. **About Ranipur Wildlife Sanctuary:** • Ranipur Wildlife Sanctuary, was founded in 1977. • This will be the fourth tiger reserve in the state to be developed, after Dudhwa, Pilibhit, and Amangarh. • RWS has no tigers of its own. But it is an important corridor for the movement of tigers. • The Ranipur Tiger Reserve has tropical dry deciduous forests and is home to fauna such as tigers, leopards, sloth bears, spotted deer, sambhar, chinkara and a number of birds and reptiles. • It will also be the first in the state's portion of the Bundelkhand region, which it shares with neighboring Madhya Pradesh. • There are 53 Tiger Reserves in India spread across India. • There were 2,967 tigers in India according to the National Tiger Conservation Authority estimation in 2018. **About National Tiger Conservation Authority:** • The **National Tiger Conservation Authority (NTCA)** is a statutory body under the **Ministry of Environment, Forests and Climate Change** constituted under enabling provisions of the Wildlife (Protection) Act, 1972, as amended in 2006, for strengthening tiger conservation. • The authority consists of the Minister in charge of the Ministry of Environment and Forests (as Chairperson), the Minister of State in the Ministry of Environment and Forests (as Vice-Chairperson), three members of Parliament, Secretary, Ministry of Environment and Forests and other members. • The '**Project Tiger**' is a **Centrally Sponsored Scheme (CSS) of the Ministry of Environment, Forests and Climate Change**, providing funding support to tiger range States for in-situ conservation of tigers in designated tiger reserves. **Map showing locations of Tiger Reserves in India:**
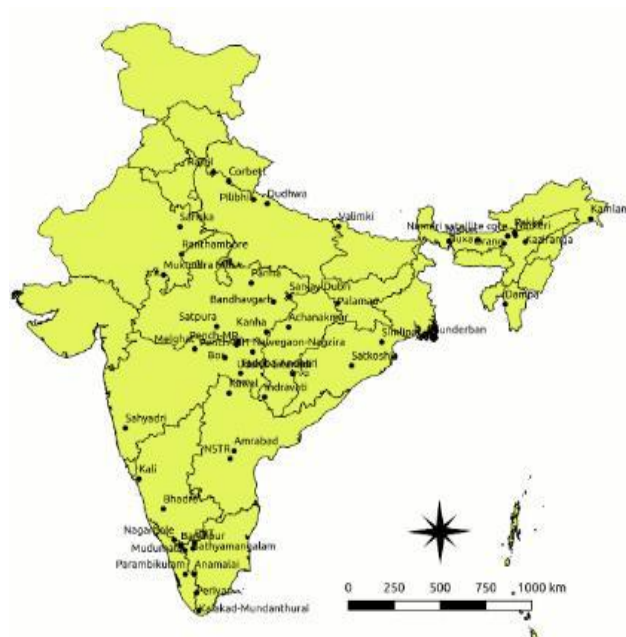
Green Accounting	**Context:** Ecologists and environmental economists scorn how superficially countries maintain their financial and national accounts.

Context: Ecologists and environmental economists scorn how superficially countries maintain their financial and national accounts.

- Amounts spent on building human skills, providing education, nutrition, and safeguarding health, land, air, and water quality or forests are classified as consumption expenditure in the national accounts, except for the associated construction and equipment purchased.

What is Green Accounting?

- Green accounting is a type of accounting that attempts to factor environmental costs into the financial results of operations.
- It has been argued that gross domestic product ignores the environment and therefore policymakers need a revised model that incorporates green accounting.
- The major purpose of green accounting is to help businesses understand and manage the potential quid pro quo between traditional economic goals and environmental goals.

Sustainability checks on the output generated:

- National accounts measure output by assessing income generation.
- Environmental economic accounts measure output as the change in natural capital (as distinct from physical capital- buildings, roads, machinery- all of which degrade natural capital).
- The flaw in the national accounts' approach of focusing on the output generated from capital is that it does not have a "sustainability" check.
- Environmental economists instead deduct the value of natural capital degraded in the process of generating income from the annual output, to assess whether economic growth is negative or positive.
- Negative growth is unsustainable because it borrows from the future to enjoy income today—a Ponzi scheme that cannot be played endlessly—akin to a country accumulating debt without building the capacity to repay it.

The flawed logic of substitutability and an infinite supply of natural resources:

- The logic of not accounting for the stock of natural resources in the **United Nations Statistical Commissions' (UNSC)** approved system of national accounts, followed worldwide, is simply that natural resources were, till very recently, presumed to be inexhaustible and in specific cases even substitutable.
- For instance, Wood can be replaced by limestone-based cement and iron for building houses. Coal is replaceable with petroleum oil, natural gas, biofuels, or newer forms of renewable energy for our energy services.
- Ecologists and environmental economists reject the assumption of infinite substitutability of natural resources as based on less than adequate knowledge of how nature works.
- They view the stock of natural resources as the outcome of innumerable complementary processes between specific resources, linking them together organically.
- Extracting a part of the whole could disturb the equilibrium and send a stable ecosystem over the "tipping point"—a phrase the world is now familiar with since the impact of cumulative carbon emissions on global warming and climate has become the subject of close scientific scrutiny.

System of Environmental-Economic Accounts (SEEA):

- Recognising the need to make economic accounting environment-sensitive, the **UNSC formulated the System of Environmental-Economic Accounts (SEEA)** in 2012.
- The SEEA (central framework) applies the accounting concepts, structures, rules, and principles of the System of National Accounts (SNA) to environmental information.

- It allows for the integration of environmental information (often measured in physical terms) with economic information (often measured in monetary terms) in a single framework.
- India – A graduated approach to green accounting:
- In India, the **Central Statistical Organisation (CSO)** leads in embedding environmental economic valuations into natural capital stocks and services.
- Following the 1992 Earth Summit, CSO produced a Framework for the Development of Environmental Statistics (FDES).
- A Compendium of Environmental Statistics was released in 1997 and updated periodically.
- The Ministry of Statistics and Plan Implementation commissioned a set of studies between 2000 to 2006 assessing and valuing land, forests, air, water, and subsoil resources.
- An expert group chaired by Dr. Patho Dasgupta released a report **"Green National Accounts in India"** in 2013, which proposed a framework, aligned with the SEEA framework.
- The CSO released physical accounts for four resources—land, water, minor minerals, and forests in 2018.
- EnviStats India 2019 added a quality index for two resources—soil and water and valued two services—cropland ecosystem services and natural resource-based tourism services.
- The task of making government financial accounting systems compatible with environmental economic accounting is being led by the **Government Accounting Standards Advisory Board (GASAB)** under the Comptroller and Auditor General, which published a Concept Paper on "Natural Resource Accounting in India" in June 2020.

Biodiversity Mainstreaming	**In News:** In a report released at the 8th World Forest Week held in Rome, on the side-lines of the 26th session of **Committee on Forestry (COFO)**, Mainstreaming biodiversity in 'production forests' has been cited as paramount. • The report was produced through a partnership between **FAO and the non-profit Centre for International Forestry Research (CIFOR)**, the lead centre of the CGIAR Research Program on Forests, Trees and Agroforestry. • In 2019, FAO adopted the Strategy on Mainstreaming Biodiversity across Agricultural Sectors. • Mainstreaming biodiversity means embedding biodiversity considerations into policies, strategies and practices of key public and private actors to promote the conservation and sustainable use of natural resources. • Mainstreaming biodiversity in forestry involves prioritizing forest policies, plans, programmes, projects and investments that have a positive impact on biodiversity at the ecosystem, species and genetic levels. • Biodiversity mainstreaming in the forest sector requires integrated multi-stakeholder approaches that cross-sectoral boundaries • **COFO is FAO's forestry statutory body.** • CGIAR is a global partnership that unites international organizations engaged in research about food security. **Significance:** • Forests are home to most of the world's terrestrial biodiversity. • Forests cover 31 per cent of the world's land surface & store an estimated 296 gigatonnes of carbon.

- The world's forests provide habitats for about 80 percent of amphibian species, 75 per cent of bird species and 68 per cent of mammal species. In addition, about 60 percent of all vascular plants occur in tropical forests.
- The role of forests in maintaining biodiversity is explicitly recognised by the United Nations Strategic Plan for Forests 2017–2030.

Recommendations of the report:

- Halting and reversing deforestation.
- Combating illegal and unregulated forest activities.
- Recognising the forest tenure of Indigenous Peoples and local communities.
- Preventing the conversion of natural forests into monospecific forest plantations.
- Ensuring the sustainable management of harvested species.
- Managing and controlling invasive and overabundant species.
- Leveraging global momentum on restoration to enhance biodiversity conservation.
- Adopting a multisectoral perspective.
- Providing economic incentives.
- Facilitating market-based instruments.
- Investing in knowledge and capacity development.
- In the Democratic Republic of the Congo, the involvement of Indigenous Peoples, local communities and the private sector in biodiversity management should be a priority and laws, policies and national strategies for biodiversity conservation should consider forests other than protected areas.

Human-Animal conflict	**In News:** Tiger T-104 was put down by the forest department of Bihar in the Valmiki Tiger Reserve according to protocol laid down by National Tiger Conservation Authority (NTCA) for man-eater tigers, on the orders of the Chief Wildlife Warden (CWW) of Bihar.

- The tiger in question was a three-year-old male, who had killed 10 people in the district.
- Four years ago, Avni or T1, the man-eating tigress of Yavatmal district in Maharashtra, had been similarly eliminated after she mauled 13 people to death.
- Tiger is listed under Schedule 1 of the Wild Life (Protection) Act, 1972 (WLPA).

Valmiki Tiger Reserve (VTR):

- It is the 18th tiger reserve of India, situated in the North West corner of the State of Bihar, in West Champaran district of the state.
- In the north, the protected areas are bordered by Nepal while the Indian state Uttar Pradesh bounds the Wildlife Sanctuary from western side.
- VTR comprises the Valmiki National Park and Valmiki Wildlife Sanctuary.
- The pristine forest and wilderness of VTR is an excellent example of Himalayan Terai landscape.
- VTR is one of the eleven Level 1 Tiger Conservation Units (TCU) in the Indian sub-continent, where long term survival of Tigers (Panthera Tigris) is possible.
- The Reserve has also been designated as an Important Bird Area (IBA) by the Indian Bird Conservation Network.
- **Fauna:** Tigers, sloth bear, leopard, Indian gaur, hyena, wild dogs, blue bull, leopard cat, wildcat, fishing cat, Himalayan pan. The dolphin & gharial are present in Gandak river.
- **Flora:** Bhabar Dun Sal Forest, Dry Siwalik Sal Forest, West Gangetic Moist Mixed Deciduous Forest.

Wildlife Protection Act (WPA) 1972:

- In India, wildlife conservation and protection are maintained under the Wildlife (Protection) Act, 1972.
- The Act is a product of the times when environmental jurisprudence was rapidly developing in India with due credit to judicial activism.

- The current Act is comprehensive and protects all kinds of animals – amphibians to birds, mammals, and reptiles and specified plants that cannot be destroyed and damaged without the approval of the government.
- Powers to the State Governments: to protect and preserve animals and birds as per Section 3 including prohibition on the capturing, killing, selling, buying, possessing of the animals including their plumage (feathers) and to grant licenses.
- **The Central Government is empowered to appoint the Director of Wildlife Preservation.**
- The State Government is required to **appoint the Chief Wildlife Warden(CWW), Wildlife Wardens, and Honorary Wildlife Wardens**.
- **Constitution of the National Board for Wildlife** with the PM as its chairperson.
- **6 schedules include protection to both animals and plants including Vermin (specified in Schedule five)**
- **Recognition of Protected Areas (PAs) such as Wildlife Sanctuaries and National Parks.**

Sodium Chromate

Context: A section of environmentalists have flagged irregularities in the draft Environmental Impact Assessment report for a proposed chemical plant in Telangana's Nalgonda district.

- More than 96% of chromite resources are located in Odisha, mostly in Jajpur, Kendujhar and Dhenkanal districts. Minor deposits are scattered over Manipur, Nagaland, Karnataka, Jharkhand, Maharashtra, Tamil Nadu, Telangana and Andhra Pradesh.

Key details about Sodium Chromate and dichromate:

Sodium Chromate:
- Sodium chromate is the inorganic compound with the formula Na_2CrO_4.
- It exists as a yellow hygroscopic solid, which can form tetra-, hexa-, and decahydrates.
- It is an intermediate in the extraction of chromium from its ores.

- Sodium chromate is
- It is obtained on a vast scale by roasting chromium ores in air in the presence of sodium carbonate
- The compound is also corrosive and exposure may produce severe eye damage or blindness.
- Human exposure further encompasses impaired fertility, heritable genetic damage and harm to unborn children.

Sodium dichromate:
- Sodium chromate converts to sodium dichromate when treated with acids.
- Sodium dichromate is a hazardous chemical.
- It is corrosive to the eyes, skin and respiratory tract.
- Exposure to the substance may affect the kidney and liver.
- Even a brief exposure to the substance can damage tissues.
- Repeated or prolonged inhalation may cause nasal ulceration. This may result in perforation of the nasal septum.
- The substance is very toxic to aquatic organisms.
- It may cause long-term effects on the marine environment.

Application of Sodium Chromate:
- Production of chromium from its ores.
- Used as a corrosion inhibitor in the petroleum industry.
- A dyeing auxiliary in the textile industry.
- A diagnostic pharmaceutical in determining red blood cell volume.

	• In organic chemistry, sodium chromate is used as an oxidant, converting primary alcohols to carboxylic acids and secondary alcohols to ketones. • Sodium chromate is a strong oxidizer.
Lead Poisoning in India	**Context:** A central government report has found that India bears the world's highest health and economic burden due to lead poisoning. **Key findings of the report:** • The report was prepared jointly by government think tank **Niti Aayog and the Council of Scientific & Industrial Research (CSIR).** • Bihar, Uttar Pradesh, Madhya Pradesh, Jharkhand, Chhattisgarh and Andhra Pradesh had the highest average blood lead levels (BLL) among Indian states. • Some 23 states have an average BLL that goes beyond five micrograms per decilitre (µg / dl) — the standard used to gauge poisoning. • The statistics are worrying on a national level with the average for the country being 4.9 µg / dl for children less than two years old. • The UNICEF report also noted that lead poisoning shaved off an estimated five per cent of Indian Gross Domestic Product (GDP) due to lower economic productivity and reduced lifetime earnings. • It also caused 230,000 premature deaths in India. **Details about Lead:** • Lead is a naturally occurring toxic metal found in the Earth's crust. • Lead in the body is distributed to the brain, liver, kidney and bones. It is stored in the teeth and bones, where it accumulates over time. • Human exposure is usually assessed through the measurement of lead in blood. • Lead in bone is released into blood during pregnancy and becomes a source of exposure to the developing foetus. • There is no level of exposure to lead that is known to be without harmful effects. • Lead exposure is preventable. **About Lead Poisoning:** • Lead poisoning or chronic intoxication is caused by the absorption of Lead in the system and is characterized especially by fatigue, abdominal pain, nausea, Diarrhea, loss of appetite, anaemia, a dark line along the gums, and muscle paralysis or weakness of limbs. • Children younger than 6 years are especially vulnerable to lead poisoning, which can severely affect mental and physical development. At very high levels, lead poisoning can be fatal. • Lead exposure also causes anaemia, hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. • More than three quarters of global lead consumption is for the manufacture of lead-acid batteries for motor vehicles. **Sources of lead poisoning:** battery recycling, lead mining, smelting, welding, soldering and automobile repatriating adulterated spices, cosmetics and traditional medicines. **Indian Government Initiatives:** • **The Ministry of Environment, Forest and Climate Change (MOEFCC)** has passed a notification as **"Regulation on Lead contents in Household and Decorative Paints Rules, 2016"** and has prohibited manufacture, trade, import as well as export of household and decorative paints containing lead or lead compounds in excess of 90 Parts Per Million (PPM).

Living Planet Report 2022	**In News:** Nature NGO WWF has published the latest edition of its Living Planet Report. • The last edition, published two years ago, revealed that the population sizes of animals (excluding insects) had decreased by an average of 68% between 1970 and 2020. **About Living Planet Report:** • The Living Planet Report 2022 is a comprehensive study of trends in global biodiversity and the health of the planet. • It is an annual flagship World Wide Fund for Nature (WWF) publication. • It is the world's leading, science-based analysis, on the health of our planet and the impact of human activity. • It links climate change and biodiversity loss for 1st time. Biodiversity loss and climate crisis should be dealt with as a single issue. **Findings:** • WWF identified six key threats to biodiversity — agriculture, hunting, logging, pollution, invasive species and climate change — to highlight 'threat hotspots' for terrestrial vertebrates. • Wildlife populations of mammals, birds, amphibians, reptiles and fish across the globe decline by 69% in the last 50 years. • Latin America and the Caribbean region recorded the highest decline i.e., 94 percent. • Africa recorded a 66 per cent fall in its wildlife populations from 1970-2018 • Asia Pacific recorded a decline of 55 per cent. • Freshwater species populations globally reduced by 83 per cent. • The vertebrate wildlife populations are plummeting at a particularly staggering rate in tropical regions of the world. • Habitat loss and barriers to migration routes were responsible for about half of the threats to monitored migratory fish species. • Mangroves are lost to aquaculture, agriculture and coastal development at a rate of 0.13 percent per year. • Many mangroves are also degraded by overexploitation and pollution, alongside natural stressors such as storms and coastal erosion. **India Findings:** • Around 137 square kilometers of the Sundarbans mangrove forest in India and Bangladesh has been eroded since 1985, reducing land and ecosystem services for many of the 10 million people who live there. • Climate change in India will impact key areas, such as water resources, agriculture, natural ecosystems, health and the food chain
Carbon Dating	**In News:** A court in Varanasi rejected a plea asking for a scientific investigation into the structure found inside the Gyanvapi Mosque that the Hindu side has claimed is a Shivling. • If Carbon Dating or Ground Penetrating Radar is permitted and if any damage is caused to the 'Shiva Linga' then it would be a violation of the Supreme Court order to protect it and it might also hurt the religious sentiments of the general public. **What is carbon dating?** 1. **Of Living things:** A widely-used method to establish the age of organic materials, things that were once living. Living things have carbon in them in various forms. The dating method is based on the fact that Carbon-14 (C-14), an isotope of carbon with an atomic mass of 14, is radioactive, and decays at a well-known rate. This is how it works: • The most abundant isotope of carbon in the atmosphere is C-12. A very small amount of C-14 is also present. The ratio of C-12 to C-14 in the atmosphere is almost static, and is known.

- Plants get their carbon through photosynthesis; animals get it mainly through food. Because plants and animals get their carbon from the atmosphere, they too acquire C-12 and C-14 in roughly the same proportion as is available in the atmosphere.
- When they die, their interactions with the atmosphere stops. While C-12 is stable, the radioactive C-14 reduces to one-half of itself in about 5,730 years — known as its 'half-life'.
- The changing ratio of C-12 to C-14 in the remains of a plant or animal after it dies can be measured, and can be used to deduce the approximate time when the organism died.

Of Non-living things: Carbon dating not used: Though extremely effective, carbon dating cannot be applied in all circumstances. It cannot be used to determine the age of non-living things like rocks, for example. Also, the age of things that are more than 40,000-50,000 years old cannot be arrived at through carbon dating. This is because after 8-10 cycles of half-lives, the amount of C-14 becomes almost very small and is almost undetectable.

Usage of radiometric dating methods

- Many of these involve elements with half-lives of billions of years, which enable scientists to reliably estimate the age of very old objects. Two commonly employed methods for dating rocks are potassium-argon dating and uranium-thorium-lead dating.
- The radioactive isotope of potassium decays into argon, and their ratios can give a clue about the age of rocks.
- Uranium and thorium have several radioactive isotopes, and all of them decay into the stable lead atom. The ratios of these elements present in the material can be measured and used to make estimates about age.
- Useful in studying buried objects or changes in topology: Cosmogenic nuclide dating, or CRN, and is regularly applied to study the age of ice cores in polar regions.
- In some situations, carbon dating can be used indirectly as well. For example, a way in which the age of ice cores in glaciers and polar regions is determined by studying carbon dioxide molecules trapped inside large ice sheets. The trapped molecules have no interaction with the outside atmosphere, and are found in the same state as when they were trapped. Determining their age gives a rough estimate of the time when the ice sheets were formed.
- How long a rock has been at a particular place can also be determined similarly — organic materials like dead plants or insects trapped underneath can give an indication of when that rock reached that place.

Wildlife Diplomacy

In News: The Indian government is considering a proposal from Colombo to export 6 gaurs, or Indian Bisons, to Sri Lanka to revive the population of gavaras that have been extinct in the island since the end of the 17th century.

- It would be the first such agreement between India and Sri Lanka, and part of a global trend of "wildlife or zoological diplomacy".

About Indian Gaur:

- The Indian gaur, a reclusive beast that lives in the wild, is the largest wild bovine that is a protected species and included in Schedule I of the Wild Life Protection Act, 1972
- **IUCN Red List status: Vulnerable**
- There are about 13,000 to 30,000 gaurs in the world with approximately 85% of the population present in India.
- It is also found in Burma and Thailand.
- The domesticated form of the gaur is called **gayal (Bos frontalis) or Mithun.**
- The first-ever population estimation exercise of the Indian gaur carried out in the Nilgiris Forest Division in February 2020 estimated around 2,000 Indian gaurs to be inhabiting the division.

	• This came after instances of people being attacked or injured by the bison primarily in and around plantations came to light. • Sri Lankan gaur, called the gavara in Sinhala, was once widespread and archaeological remains in ancient caves in the island included the remains of the animal.
Vulture Conservation	**Context:** Recently the Tamil Nadu Government formed a State-level Committee to set up an institutional framework for the effective conservation of vultures. • Alarmed at the 96% decline in India's vulture population between 1993 and 2003, the Central government put into place two action plans to protect the species at the national level: the first in 2006 and the second, ongoing plan for 2020-2025. • One of the important action points in this nationwide plan is the formation of State-level committees to save the critically endangered population of vultures. **Tamil Nadu is home to four types of Vulture species:** **The Oriental white-backed vulture:** • It is the most common vulture species in the continent of Africa. • When it was first assessed in 1988 it was classified as a Least concern species owing to a large range and population. • It was reassessed from a Least Concern to Near Threatened species in the 2007 IUCN Red List. • In 2012 it was added to the list of Endangered species. • In 2015, it was further listed to Critically Endangered because the decline had reached a magnitude that puts the vulture at an extreme risk of extinction. **The long-billed vulture** • The Indian vulture/long billed vulture is native to India, Pakistan and Nepal. • It has been listed as Critically Endangered on the IUCN Red List since 2002. • Indian vultures died of kidney failure caused by diclofenac poisoning. It breeds mainly on hilly crags in central and peninsular India. • The Indian vulture and the white-romped vulture have suffered a 99%–97% population decrease in Bangladesh, Pakistan and India. • Diclofenac is a non-steroidal anti-inflammatory drug (NSAID) and when given to working animals it can reduce joint pain and so keep them working for longer. • The drug is believed to be swallowed by vultures with the flesh of dead cattle who were given diclofenac in their last days of life. **The red-headed vulture** • The red-headed vulture also known as the Asian king vulture, Indian black vulture or Pondicherry vulture is mainly found in the Indian subcontinent, with small populations in some parts of Southeast Asia. • It has no subspecies. • Today the range of the red-headed vulture is localized primarily to northern India.
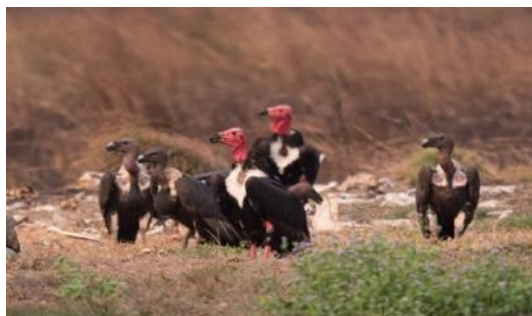
- It was listed as critically endangered in the 2007 IUCN Red List.

The Egyptian vulture

- The Egyptian vulture, also called the white scavenger vulture or pharaoh's chicken, is only member of the genus Neophron.
- It is widely distributed from the Iberian Peninsula and North Africa to India
- IUCN Red List Status: Endangered.

Conservation Efforts in India:

- Identification and removal of threats near the nesting and roosting sites, making food and water available to them is what needs to be done.
- Understanding their habitat use and their behavior.
- **Vulture Recovery Plan** – banning the veterinary use of diclofenac, finding its substitute and set up conservation breeding centres for vultures.
- **Action Plan for Vulture Conservation 2020-2025**
- PIL filed in Delhi High Court about not banning nimesulide, aceclofenac and ketoprofen which are toxic to the vultures.
- The Centre has formed a committee made up of members from the BNHS and Indian Veterinary Research Institute to formulate a release policy for vultures being bred at the centres.

'Viral Spillover Risk'	**In news:** A research article titled, **'Viral Spillover risk increases with climate change in High Arctic Lake sediments',** was published in the biological research journal of the UK's The Royal Society.

What is viral Spillover?

- Viruses need to infect a host's cell in order to replicate.
- These virus/host relationships seem relatively stable within super kingdoms, the major groupings of organisms.
- However, below this rank, viruses may infect a new host from a reservoir host (in which it usually resides) by being able to transmit sustainably in a novel host – a process defined as 'viral Spillover'.
- Climate change leads to shifts in species ranges and distributions, new associations can emerge, bringing in vectors that can mediate viral spill overs.
- The High Arctic zone (regions of Canada within the Arctic Circle such as the Northern islands) could become fertile ground for emerging pandemics.

About the study:

- Researchers collected sediment and soil samples from Lake Hazen in Canada – the largest High-Arctic Lake by volume in the world, and the region's largest freshwater ecosystem.
- Then they undertook DNA and RNA sequencing to reconstruct the lake area's virus composition.
- They estimated the spillover risk and found that the chances of a virus moving to a new host increase with runoff from glacier melt caused due to climate change.
- As temperatures increase, the melting of glaciers increases as well, and there is a greater possibility for previously ice-trapped viruses and bacteria to find new hosts.

Sandalwood Spike Disease (SSD)	**Context:** Recently, Sandalwood Spike Disease started infecting natural habitats in Karnataka and Kerala. India's sandalwood trees, particularly of Karnataka, are facing a serious threat with the return of the destructive Sandalwood Spike Disease (SSD).

- Presently, there is no option but to cut down and remove the infected tree to prevent the spread of the disease.

About Sandalwood Spike Disease:

- It is an infectious disease which is caused by
- Phytoplasmas are bacterial parasites of plant tissues which are transmitted by insect vectors and involved in plant-to-plant transmission.
- The disease is characterized by a huge reduction in leaf size which is also accompanied by stiffening and reduction of internode length.
- At the advanced stage of the disease, the entire shoot gives the appearance of a spike of the inflorescence.
- There is no cure as of now for the infection.
- Emergence of the disease- The disease was first reported in Kodagu in 1899.
- More than a million sandalwood trees were removed in the Kodagu and Mysore region between 1903 and 1916 which prompted the Maharaja of Mysore to announce a reward in 1907 of ₹10,000 for anyone finding a remedy.
- The growing stock had been reduced to 25% of its initial level between 1980 and 2000 in Karnataka.
- Following this, the International Union of Conservation of Nature declared Sandalwood as "Vulnerable" in 1998.
- SSD has been one of the major causes of the decline in sandalwood production in the country for over a century.
- About 1% to 5% of sandalwood trees are lost every year due to the disease. Scientists warn that it could wipe out the entire natural population if measures are not taken to prevent its spread.

Reasons for Spread:

- The present rapid spread of the infection is largely due to restrictions on green felling in forests, which has allowed vectors to spread the disease to healthy trees.
- Green felling (silviculture felling) is the felling of green trees of one or more types.

About Sandalwood:

- India has been the traditional leader of **sandalwood oil production for perfumery and pharmaceuticals.** As early as 1792, Tippu Sultan had declared it a 'Royal Tree' of Mysore.
- Red Saunder/ Red Sandalwood- Found in **southern Eastern Ghats Mountain range of South India.**
- This tree is valued for the rich red colour of its wood. The wood is not aromatic.
- The International Union for Conservation of Nature (IUCN) has put it under the category of near threatened from earlier endangered species in the Red List.
- It is listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- The tree is not to be confused with the aromatic Santalum sandalwood trees that grow natively in South India.
- Red sandalwood has been used for making the bridge and also the neck of the Japanese musical instrument Shamisen and in furniture in China for its porch appearance.

Blue Flag certification

In News: Two beaches in Lakshadweep, have been accorded the 'Blue Flag' tag.

- India now has 12 "blue beaches".

About:

- The Blue Flag is an exclusive eco-label or certification that is given to coastal locations around the world as a badge of environmental honour.
- The Blue Flag programme started in 1987, initially in Europe and the certification is awarded annually.

- It is one of the world's most recognised voluntary awards for beaches, marinas, and sustainable boating tourism operators.
- **The Blue Flag programme is run by the Copenhagen, Denmark-headquartered Foundation for Environmental Education (FEE), a non-profit which, through its work, contributes to the Sustainable Development Goals (SDGs) of the United Nations**.
- The certification is given by an international jury comprising members of the **United Nations Environment Programme (UNEP), United Nations World Tourism Organisation (UNWTO), and International Union for the Conservation of Nature (IUCN), besides FEE.**

Beaches in India:
- The two new beaches to have been awarded the eco-label are Minicoy Thundi beach and Kadmat beach, both in Lakshadweep.
- The other 10 Indian beaches on the list are Shivrajpur in Gujarat's Devbhumi Dwarka district; Ghogla beach in Diu; Kasarkod (Uttara Kannada) and Padubidri (Udupi) in Karnataka; Kappad (Kozhikode) in Kerala; Eden beach in Puducherry; Kovalam (Chennai) in Tamil Nadu; Rushikonda (Visakhapatnam) in Andhra Pradesh; Golden beach in Puri, Odisha; and Radhanagar Swarajdeep in Andaman and Nicobar.
- Kovalam and Eden got the Blue Flag last year. The other eight beaches received the certification in 2020, and were re-certified last year.

SOCIETY & SOCIAL ISSUES

Atma Nirbhar in Defence production	**Context:** According to a recent study released by the Stockholm International Peace Research Institute (SIPRI, India ranks fourth among 12 Indo-Pacific nations in self-reliant arms production capabilities.

- The 12 countries in the study were selected because they have the highest military spending in the region- **Australia, China, India, Indonesia, Japan, South Korea, Malaysia, Pakistan, Singapore, Taiwan, Thailand and Vietnam.**
- China tops the list, Japan is second, South Korea is in third place, and Pakistan is at number 8.
- India is ranked as the second largest importer of arms for its armed forces in 2016-20.

Indian Companies & suppliers:

- Hindustan Aeronautics Ltd, Indian Ordnance Factories, Bharat Electronics, Mazagaon Docks and Cochin Shipyard are among the major Indian arms servicing companies.
- Ashok Leyland, one of the largest suppliers of trucks to the Indian Army, is the only company ranked in the top 50 in the Indo-Pacific.

Atma Nirbhar in defense production:

Make-I Category:

- Under the Defence Acquisition Procedure 2020, 'Make' Category aims to achieve self-reliance by involving greater participation of Indian industry.
- Projects involving design and development of equipment, systems, major platforms or upgrades thereof by the industry can be taken up under this category.

Financial Support:

- The Ministry of Defence will provide financial support up to 70% of the total cost of prototype development.

Make-II Category:

- It is funded by industry with assured procurement. The following platform has been listed – Anti-jamming Systems for Multiple Platforms.

Special Purpose Vehicle (SPV) Model:

- Under this, private industry will be encouraged to take up the design and development of military platforms and equipment in collaboration with the Defence Research and Development Organisation (DRDO) and other organizations.
- Following two platforms have been identified under this category.
    - Long Range Unmanned Aerial Vehicles (UAVs) [High Altitude Long Endurance (HALE)].
    - Indian Multi Role Helicopter (IMRH).

iDEX:

- Projects of Start-ups, MSMEs etc. involving high-end innovation would be pursued under the iDEX category and the following platform has been selected under this category –
- Low Orbit Pseudo Satellites.
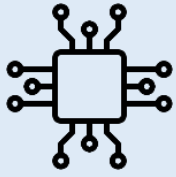
SCIENCE & TECHNOLOGY

Medicinal Fungi	**Context:** Recently, an analytical study of medicinal fungi carried out by researchers from the Institute of Mathematical Sciences, Chennai (IMSc), shows that some chemicals they secrete may find use as novel drugs.
	About Medicinal Fungi:
	• They used a database, **MeFSAT (Medicinal Fungi Secondary Metabolites and Therapeutics),** which compiles information on 184 medicinal fungi, including mushrooms.
	• Medicinal fungi belong to **two taxonomic divisions namely, Basidiomycota and Ascomycota.**
	• **Mushrooms belong to the Basidiomycota division.**
	• An example is **Agaricus bisporus, the button mushroom, which can be consumed.**
	• **Fungi belonging to the Ascomycota** division are generally not mushrooms.
	• Among these are **Isaria cicadae and Shiraia bambusicola** which are used in traditional Chinese medicine.
	Significance of the research :
	• Secondary metabolites are chemical compounds that fungi produce when they are stressed.
	• These are not strictly essential and hence the name 'secondary'.
	• They enhance the fungus' ability to survive.
	• The work has been published in the preprint **server BioRXiv.**
	• Cordycepin, a secondary metabolite produced by Cordyceps species of fungus, is known to have antitumor properties.
Light Combat Helicopter	**Context:** Recently, indigenous **Light Combat Helicopter (LCH)('Prachand'),** capable of destroying enemy air defense, conducting counterinsurgency strikes and much more, was formally inducted into the Indian Air Force (IAF) at the Jodhpur air base.
	• According to its makers, the LCH is the only attack helicopter in the world which can land and take off at an altitude of 5,000 meters with a considerable load of weapons and fuel, meeting the specific requirements laid out by the Indian Armed Forces.
	Features of the LCH:
	• LCH has the maximum take-off weight of 5.8 tonnes, maximum speed of 268 kilometers per hour, range of 550 kilometers, endurance of over three hours and service ceiling — the maximum density altitude to which it can fly — of 6.5 kilometers.
	• The helicopter uses radar-absorbing material to lower radar signature and has a significantly crash-proof structure and landing gear. A pressurized cabin offers protection from Nuclear, biological and chemical (NBC) contingencies.
	• The helicopter is equipped with a countermeasure dispensing system that protects it from enemy radars or infrared seekers of the enemy missiles. As far as weapons systems are concerned, a 20 mm turret gun, 70 mm rockets and air-to-air missile systems are onboard.
	• LCH is powered by two French-origin Shakti engines manufactured by the HAL.
	• With these features, the LCH has the capabilities of combat roles such as destruction of enemy air defense, counter insurgency warfare, combat search and rescue, anti-tank, and counter surface force operations.

VyomMitra	**Context:** Vyom mitra, the humanoid designed and developed by the Indian Space Research Organisation (ISRO) to fly aboard unmanned test missions ahead of the Gaganyaan human space-flight mission, is undergoing pre-flight ground tests at the ISRO Inertial Systems Unit (IISU).

About the Half-humanoid:

• Vyommitra is a female-looking spacefaring humanoid robot being developed by the Indian Space Research Organisation to function on-board the Gaganyaan, a crewed orbital spacecraft.

• A humanoid is basically a robot with the appearance of a human being.

• **ISRO's Vyom Mitra (vyoma = space, mitra = friend)** is also being called a half-humanoid since she will only have a head, two hands and a torso, and will not have lower limbs. Like any robot, a humanoid's functions are determined by the computer systems to which it is connected.

Why is ISRO developing a humanoid?

• ISRO plans to send a human into space for the first time by 2022.

• It is racing against time to develop a crew module and rocket systems that will ensure the safe travel and return of the Indian astronaut.

• Other countries that have successfully launched humans into space did so after having used animals for conducting tests of their rockets and crew recovery systems.

• ISRO will use the humanoid to test the efficacy of its GSLV Mk III rocket to transport a human to space and back.

• The humanoid is under development at a robotics laboratory at the Vikram Sarabhai Space Centre.

• Once flown into space, ISRO's half-humanoid will be able to test systems in the crew module meant for the survival and safe travel of the first Indian astronaut in 2022.

What are the tasks that Vyommitra will perform in space?

• A central character in the science-fiction film **Interstellar (2014),** which is about space and time travel, is an artificial-intelligence -and-robotics-powered computer system called TARS, which talks to the astronauts, assists them in mission functions, and even rescues them in times of crisis.

• The activities that Vyom mitra will be able to perform, once fully developed for the unmanned flight, will include:

  o procedures to use equipment on board the spacecraft's crew module such as safety mechanisms and switches,

  o receiving and acting on commands sent from ground stations

  o attaining launch and orbital postures,

  o responding to the environment,

  o generating warnings,

  o replacing carbon dioxide canisters,

  o operating switches,

  o monitoring of the crew module,

  o receiving voice commands,

  o responding via speech (bilingual).

Palaeogenomics	**Context:** The Nobel Prize for Physiology this year has been awarded to Svante Pääbo, Swedish geneticist, who pioneered the field of Palaeogenomics, or the study of ancient hominids by extracting their DNA. **What is the significance of Pääbo's work?**

- The study of ancient humans has historically been limited to analysing their bones and objects around them such as weapons, utensils, tools and dwellings.
- Pääbo pioneered the use of DNA, the genetic blueprint present in all life, to examine questions about the relatedness of various ancient human species.
- He proved that Neanderthals, a cousin of the human species that evolved 1,00,000 years before humans, interbred with people and a fraction of their genes — about 1-4% — live on in those of European and Asian ancestry.
- Later on, Pääbo's lab, after analysing a 40,000-year-old finger bone from a Siberian cave, proved that it belonged to a new species of hominin called Denisova.
- This was the first time that a new species had been discovered based on DNA analysis and this species too had lived and interbred with humans.

What has Pääbo's work shown?

- Pääbo's most important contribution is demonstrating that ancient DNA can be reliably extracted, analysed and compared with that of other humans and primates to examine what parts of our DNA make one distinctly human or Neanderthal.
- Comparative analyses with the human genome demonstrated that the most recent common ancestor of Neanderthals and Homo sapiens lived around 8,00,000 years ago.
- In 2008, a 40,000 year-old fragment from a finger-bone, sourced from a Siberian cave in a region called Denisova, yielded DNA that, analysis from Pääbo's lab revealed, was from an entirely new species of hominin called Denisova.
- This was the first time that a new species had been discovered based on DNA analysis.
- Further analysis showed that they too had interbred with humans and that 6% of human genomes in parts of Southeast Asia are of Denisovan ancestry.

What are the implications of Palaeogenomics?

- The study of ancient DNA provides an independent way to test theories of evolution and the relatedness of population groups. In 2018, an analysis of DNA extracted from skeletons at Haryana's Rakhigarhi — reported to be a prominent Indus Valley civilisation site — provoked an old debate about the indigenousness of the ancient Indian population.
- These fossils, about 4,500 years old, have better preserved DNA than those analysed in Pääbo's labs as they are about 10-times younger.
- The Rakhigarhi fossils showed that these Harappan denizens lacked ancestry from Central Asians or Iranian Farmers and stoked a debate on whether this proved or disproved 'Aryan migration.'
- Palaeogenomics also gives clues into disease as researchers have analysed dental fossils to glean insights on dental infections.

ASAT weapons	**In News:** India's anti-satellite (ASAT) test in March 2019 made it the fourth country (after the United States, Russia, and China) to have a demonstrated ASAT capability.

Indian Context:

- India for decades has had a policy against the Weaponization of space, however India had remained concerned about China's growing space power since its first successful ASAT test in January 2007.
- This pushed India to invest in its own capabilities to deter China.
- Therefore, even states that want to keep their space programmes focused on civilian applications will likely focus on national security considerations under duress.

Indian ASAT:

- Mission Shakti: On 27 March 2019, India tested an anti-satellite weapon (ASAT).
- The target of the test was a satellite present in a low Earth orbit, which was hit with a kinetic kill vehicle.

	• India's ASAT test hit a target satellite at an altitude of 300 kilometers. • The ASAT test utilized a modified anti-ballistic missile interceptor code-named Prithvi Defence Vehicle Mark-II which was developed under Project XSV-1. • The test made India the fourth country after the United States, Russia and China to have tested an ASAT weapon. • The test sparked concerns regarding the creation of space debris. **Others:** • U.S.: In 2008, US Navy fired RIM-161 Standard Missile 3 ABM weapon at a decaying satellite • Russia: In 2015, Russia successfully conducted an anti-satellite mission known as PL-19 Nudol. • China: In 2017, China destroyed a satellite called Fengyun-1C with a kinetic kill warhead
Map of Milky Way	**In news:** Researchers have used complex models of the Milky Way galaxy to map out the locations of neutron stars and black holes that were created by long-dead stars. • The researchers carefully recreated the full lifecycle of these ancient star corpses to construct the first detailed map of the **"galactic underworld".** **About:** • The compact remnants of dead stars show a fundamentally different distribution and structure to the visible galaxy. • **The Milky Way's 'galactic graveyard'** stretches three times the height of the galaxy itself, while one-third of the neutron stars and black holes have been flung out of the galaxy. **How are Black holes formed:** • Black holes and neutron stars are formed when stars which are more than eight times larger than our Sun exhaust their fuel supply and suddenly collapse. • When this happens, it triggers a reaction that blows apart the outer portion of the star in a supernova explosion. • Meanwhile, the core keeps compressing itself until it becomes either a neutron star or a black hole, depending on its starting mass. • Supernova explosions are asymmetric, and the remnants are ejected at high speed – up to millions of kilometers per hour – and, even worse, this happens in an unknown and random direction for every object. • Neutron stars have cores so dense that electrons and protons combine at the subatomic level to form neutrons. This squeezes its total mass into a sphere that is **"smaller than a city."**
Next Generation Launch Vehicle (NGLV)	**In news:** The Indian Space Research Organisation (ISRO) is developing a rocket named Next Generation Launch Vehicle (NGLV) to replace its ageing workhorse the Polar Satellite Launch Vehicle (PSLV). • ISRO developed a **'Bharat Krishi satellite'** to study the growth pattern of crops, identify irrigation deficiencies and provide information that will help in pest-control and verification of farm insurance claims besides many other applications. • ISRO is also exploring the possibility of increasing civilian use of the country's indigenous satellite navigation system NaVIC.

	About NGLV:
	• **NGLV will use 'semi-cryogenic' technology which is both efficient and cost-effective.** • The new rocket could also be **'reusable'.** A reusable rocket will have a smaller payload than an expendable one. If it is reusable, the payload will be around five tonnes and if it's expendable, it will go up 10 tonnes. • Participation of the industry would ensure that capability is created outside ISRO to build, operate and launch it on a commercial basis.
Indian Deep Tech and a case for a strategic fund	**Context: In order to become a developed country in 25 years, India will need to build world-class deep tech capabilities in certain sectors.** • The Government of India is making a concerted push for self-reliance in military technology, semiconductors and science-based businesses. • However, there is a market failure where typical venture capital will not invest in this asset class, and government money is not nearly enough or is not fast enough. • To solve this market inefficiency, India should focus on "India Strategic Fund". • Certain innovations in the existing **corporate social responsibility (CSR)** budgets and **high net worth (HNI)** tax breaks will incentivise capital flowing into strategic tech. **Importance of Self reliance** • Our way of life, economic and national security are underpinned to certain general purpose technologies (GPTs). • Today, four technology battlegrounds exist, i.e., semiconductors, 5G, revolutions in biology and autonomy. Each of these is vulnerable to military conflict, health emergencies and natural disasters. • They are areas where India is still at the base of the ladder. • Self-reliance is not just a 'feel good' slogan. It is a survival imperative. **Crucial role of funding** • In the United States, Israel and North Atlantic Treaty Organization countries, government is still the largest source of funds for Deep Tech — a cutting-edge, quantum jump in capability that creates an intellectual property moat. • This funding becomes the oxygen that small businesses survive on. • This has allowed start-ups to emerge as a bridge between bench top prototypes of academia and production-hungry large industry. In India, this bridge remains unbuilt. • This is because the Indian Venture capital ecosystem is not willing to invest in it or even to discuss it. • While the western rhetoric is now beginning to shift towards increasing the military utility of commercially available technology, India needs to be cognisant of the fact that strategic technology cannot become the burden of commercial industry alone. **India Strategic Fund – Redirecting CSR and tax incentives** • While there are schemes like Indian Semiconductor Mission and the Ministry of Defence's flagship iDEX and TDF schemes, depending solely on an already stretched pool of funding is not the solution to galvanize the ecosystem. There are two avenues to build a movement of patriotic capital. **CSR budgets:** • By some estimates, the annual CSR budget is ₹15,000 crore, of which a substantial portion goes unutilised. • CSR has traditionally been utilized for the social sector. However, this growing corpus should also be used for the development of strategic technology. • Large corporations can be incentivised to use some of this budget to serve the strategic needs of the nation.

	High Net Worth (HNI) • HNIs can also be offered tax incentives to make equity investment in the same critical technology startups • This would help mitigate the pinch felt with lower short-term returns. • The corpus of investment should be tax deductible and no more than a certain percentage of annual income.
Barium found in Exoplanets	**In news:** According to the study published in the journal Astronomy and Astrophysics, scientists have detected barium in the upper atmosphere of two giant exoplanets for the first time. • The **European Southern Observatory's Very Large Telescope** located in the Atacama Desert, northern Chile was used in the process. • The scientists confirmed the presence of hydrogen, lithium, sodium, magnesium, calcium, vanadium, chromium, manganese, nickel and iron, in addition to barium. • Additionally, the team found elements such as cobalt, strontium and titanium • Discovery of barium is surprising because heavy elements like barium are expected to quickly fall into the lower layers of the atmosphere, given these exoplanets have high gravity. • Barium, two and half times heavier than iron, is the heaviest-ever detected element. **About the Exoplanets:** • These exoplanets are two ultra-hot Jupiter's — WASP-76b and WASP-121b — which orbit their host stars WASP 76 and WASP 121. • The former is about 640 light-years away from the Earth and the latter around 900 light-years away. • Ultra-hot Jupiter's are a class of hot gaseous planets that matches the size of Jupiter. But they have short orbital periods, unlike Jupiter. • Both WASP-76b and WASP-121b complete one orbit in two days. • Surface temperatures in these bodies reach as high as 1,000 degrees Celsius. • These bodies have unique features owing to their high temperatures. For instance, WASP-76b experiences iron rain. **About Barium:** • Barium is a chemical element with the symbol Ba and atomic number 56. • The element is used in metallurgy, and its compounds are used in pyrotechnics, petroleum production, and radiology. • Soluble barium compounds are poisonous. In low doses, barium ions act as a muscle stimulant, and higher doses affect the nervous system, causing cardiac irregularities, tremors, weakness, anxiety, shortness of breath, and paralysis. • Because of its high chemical reactivity, barium is never found in nature as a free element. • Barium salts are used in fireworks to generate green lights.
Adderall drug	**In News:** The US Food and Drug and Drug Administration (FDA) announced a shortage of Adderall, medication used to treat attention-deficit hyperactivity disorder (ADHD). **About Adderall:** • Adderall is the brand name for the formulation that consists of a combination of dextroamphetamine and amphetamine. • It belongs to the class of drugs known as stimulants and increases the levels of dopamine and norepinephrine in the brain. • It is an FDA-approved drug used for the treatment of ADHD and narcolepsy, a sleep condition that causes daytime sleepiness. • For people diagnosed with ADHD, Adderall can help improve focus, concentration, impulse control and hyperactivity, because of its effects on the central nervous system.

- It can also have the same effects on those who do not have ADHD.
- Adderall is classified as a Schedule II drug in the US, which means that while it has positive medicinal effects, there is a large potential for abuse.
- Over the past decade, there have been many reports about the growing use and misuses of stimulants like Adderall among students and athletes, who might find enhanced cognition or sports performance.
- Tolerance, extreme psychological dependence, and severe social disability have occurred in many people.

About ADHD:
- ADHD is one the most common neurodevelopmental disorders of childhood, usually diagnosed at an early age and lasting into adulthood.
- Children with ADHD might have trouble paying attention or controlling impulsive behaviours, and can be overly active.
- Many adults remain undiagnosed, and symptoms can cause difficulty at work, home or relationships. The CDC states that symptoms can appear different at older ages, for example, hyperactivity can appear as extreme restlessness.
- There are three different types of ADHD:
  - Predominantly Inattentive Presentation
  - Predominantly Hyperactive-Impulsive Presentation
  - Combined Presentation
- The causes and risk factors for ADHD are unknown, but current research shows that genetics plays an important role.
- Other possible causes may include brain injury, exposure to environmental risks (e.g., lead) during pregnancy or at a young age, alcohol and tobacco use during pregnancy, premature delivery, low birth weight, etc.

Polio eradication

In news: Global leaders committed to donating $2.54 billion (or Rs 19 crore) for eradicating polio at the World Health Summit.
- Bill & Melinda Gates Foundation pledged $1.2 billion to the largest international public health initiative, Global Polio Eradication Initiative (GPEI).

About:
- Wild poliovirus is endemic in just two countries — Pakistan and Afghanistan.
- However, there has been new detections of polio this year in previously polio-free countries like the United States, Israel and the United Kingdom and southeast Africa.
- The funding will support vaccinating 370 million children annually over the next five years and continue disease surveillance across 50 countries.
- It also includes roll-out of the novel oral polio vaccine type 2 (nOPV2) to stop outbreaks of type 2 circulating vaccine-derived polioviruses (cVDPV) more sustainably.
- Additionally, outbreaks of cVDPV, variants of the poliovirus can emerge in places where not enough people have been immunized.

Significance:
- If fully funded, the strategy can save up to $33.1 billion in health cost savings this century compared to the price of controlling outbreaks.
- It would also be able to deliver additional health services and immunizations alongside polio vaccines to underserved communities.

About World Health Summit:
- World Health Summit is an international health conference held annually in Berlin, Germany.

- It was founded in 2009 and is traditionally held under the patronage of the German Chancellor, the French President, the President of the European Commission, and the Director-General of the World Health Organization (WHO).
- Aim: to bring together stakeholders from politics, science, the private sector, and civil society from around the world to set the agenda for a healthier future by inspiring innovative solutions for better health and well-being for all.

About Global Polio Eradication Initiative (GPEI):
- It is a public-private partnership led by national governments with six partners
- World Health Organization (WHO)
- Rotary International
- the US Centres for Disease Control and Prevention (CDC)
- the United Nations Children's Fund (UNICEF)
- Bill & Melinda Gates Foundation
- Gavi, the vaccine alliance.
- Its goal is to eradicate polio worldwide.

Green Crackers

In News: According to the National Green Tribunal (NGT), green crackers are permitted only in cities and towns where air quality is moderate or poor.

About:
- Green crackers are developed by the Council of Scientific and Industrial Research (CSIR).
- Both green crackers and traditional crackers cause pollution.
- However, green crackers cause 30 per cent less air pollution as compared to traditional ones.
- Green crackers reduce emissions substantially and absorb dust and don't contain hazardous elements like barium nitrate.
- Toxic metals in traditional crackers are replaced with less hazardous compounds.
- There is reduction in sound as well in green crackers.

Identification of green crackers:
- Green crackers fall only in these three categories- SWAS, SAFAL and STAR.
- SWAS is "safe water release" and has a small water pocket/droplet which get released when burst, in the form of vapour, thereby suppressing the dust released and does not comprise potassium nitrate and sulphur.
- STAR is the safe thermite cracker, which does not comprise potassium nitrate and sulphur, emits reduced particulate matter disposal and reduced sound intensity.
- SAFAL is safe minimal aluminium which has minimum usage of aluminium, and used magnesium instead. It ensures reduction in sound in comparison to traditional crackers.

Toxic metals released by traditional crackers:
- White colour emitted through crackers is aluminium, magnesium and titanium, orange colour is carbon or iron.
- Yellow agents are sodium compounds
- Blue and red are copper compounds and strontium carbonates
- Green agent is barium mono chloride salts or barium nitrate or barium chlorate.

Concerns:
- Lead in crackers impact the nervous system
- Copper triggers respiratory tract irritation
- Sodium causes skin issues
- Magnesium leads to mental fume fever
- Cadmium causes anaemia and damages the kidney
- Nitrate is the most harmful that causes mental impairment. The presence of nitrite causes irritation in mucous membrane, eyes and skin.

	• The most vulnerable population though are infants, children, pregnant women, elderly and people with underlying medical conditions.
HAWK air defense equipment	**In news:** The United States is considering retrieving older HAWK air defense equipment from storage to send to Ukraine which is facing a heavy barrage of Russian drone-fired and cruise missiles. • The US sent the shoulder-fired anti-aircraft Stingers to Ukraine and they demonstrated great success in stopping Russian air assaults. • The US has provided almost $17 billion worth of security assistance to Ukraine since the launch of Russia's invasion. **HAWK missile system:** • The Stinger missile system is a smaller, shorter-range air defence system. • The HAWK interceptor missiles would be an upgrade to the Stinger missile system. • HAWK, short for 'Homing All the Way Killer', entered service with the US Army in 1959, during the Vietnam war. • It underwent upgrades over the decades that followed, including a major one in 1971 that produced the so-called I-HAWK (or improved HAWK), with a kill probability of 85%. • The HAWK system was the predecessor to the PATRIOT missile defence system that Raytheon built in the 1990s. US forces largely stopped using HAWK from the early years of the new century. • The Biden administration would use the Presidential Drawdown Authority (PDA) to transfer the HAWK equipment. • PDA allows for the speedy delivery of defence articles and services from Department of Defence stocks to foreign countries and international organizations to respond to unforeseen emergencies. • Military assistance under PDA does not require Congressional approval, and could begin arriving within days or even hours of approval.
Dirty Bomb	**In news:** Russian Defence Minister Sergei Shoigu called up Defence Ministers of India and China to convey Moscow's concern about a purported Ukrainian plan to use a "dirty bomb" designed to spread radioactive material. **Nuclear Bombs:** • A nuclear bomb is an explosive device that derives its destructive force from nuclear reactions, either fission (fission bomb) or a combination of fission and fusion reactions (thermonuclear bomb), producing a nuclear explosion. • Both bomb types release large quantities of energy from relatively small amounts of matter. • They are weapons of mass destruction as they can devastate an entire city by blast, fire, and radiation. • In 1942, under the Manhattan Project, the first nuclear bombs were dropped on Japan in Hiroshima and Nagasaki by U.S. during the Second World War. • The Nuclear Proliferation Treaty (NPT) aims to prevent the spread of nuclear weapons and weapons technology, to foster the peaceful uses of nuclear energy, and to further the goal of disarmament. • The Treaty establishes a safeguards system under the responsibility of the IAEA, which also plays a central role under the Treaty in areas of technology transfer for peaceful purposes. • The UN Treaty on the Prohibition of nuclear weapons (TPNW) • prohibits activities like not to develop, test, produce, acquire, possess, stockpile, use or threaten to use nuclear weapons.

	• Not to deploy nuclear weapons on national territory.

World Health Organization(WHO) releases first-ever list of health-threatening fungi	**Context:** WHO recently published a report highlighting the first-ever list of fungal "priority pathogens" – a catalogue of the 19 fungi that represent the greatest threat to public health.
	Highlights of the report:
	• Fungal pathogens are a major threat to public health as they are becoming increasingly common and resistant to treatment with only four classes of antifungal medicines currently available, and few candidates in the clinical pipeline.
	    ○ Most fungal pathogens lack rapid and sensitive diagnostics and those that exist are not widely available or affordable globally.
	• The WHO fungal priority pathogens list (FPPL) is the first global effort to systematically prioritize fungal pathogens, considering the unmet research and development (R&D) needs and the perceived public health importance.
	• The list's publication is opportune as fungi are becoming an increasingly common threat to public health. Global warming and increasing international travel and trade are fuelling this rise.
	    ○ The COVID-19 pandemic saw an increase in mucormycosis or black fungus infections among those hospitalized.
	• Black Fungus, White Fungus, Yellow Fungus, and Green Fungus have been attributed to COVID-19 and led to prolonged morbidity and mortality in COVID-19 patients.
	Types of fungal infections:
	• **Green Fungus:** Green Fungus or Aspergillosis is the latest addition to COVID-triggered fungal infection that has been reported in Indore.
	Symptoms: High fever, Chest pain, Cough, Nose bleeding, Shortness of breath, Weightless, Weakness or Fatigue.
	Who is at risk of getting infected with Green Fungus?
	• People with a history of allergy.
	• People with frail immunity
	• People suffering from lung disease
	Yellow Fungus:
	• Yellow Fungus, another COVID-triggered fungal infection has been reported in Ghaziabad.
	• Symptoms: Cough, Fever, Diarrhea, Dark spots on lungs, Reduced oxygen level.
	• Note: The symptoms of the White Fungus are similar to that of the COVID-19 infection.
	Who is at risk of getting infected with White Fungus?
	• People with comorbidities such as diabetes.
	• People who are on steroids for long.
	• COVID-19 patients who are on oxygen support.
	White Fungus:
	• White Fungus or Aspergillosis was detected in four patients at Patna Medical College and Hospital (PMCH) in Bihar.
	
	Symptoms: Cough, Fever, Diarrhea, Dark spots on lungs and Reduced oxygen level.
	Risk of getting infected with White Fungus:
	• People with comorbidities such as diabetes.
	• People who are on steroids for long.

	• COVID-19 patients who are on oxygen support.
	• Black Fungus: Increased cases of Black Fungus or Mucormycosis have been observed in COVID-19 patients in the national capital.
	The symptoms of Black Fungus infection are:
	• For Brain Mucormycosis: One-sided facial swelling, Headache, Nasal or sinus congestion, Black lesions on nasal bridge or upper inside of the mouth, Fever.
	• For Pulmonary Mucormycosis: Fever, Cough, Chest pain, Shortness of breath
	• For Gastrointestinal Mucormycosis: Abdominal pain, Nausea and vomiting, Gastrointestinal bleeding.
	• Risks of getting infected with Black Fungus: Diabetes, Cancer, Organ transplant, Stem cell transplant, Neutropenia, Long-term corticosteroid use, Hemochromatosis (excess of iron), Skin injury due to surgery, burns, or wounds etc.
SLBM launch by INS Arihant	**In News: T**he Ministry of Defence (MoD) announced that the indigenous Strategic Strike Nuclear Submarine INS Arihant had successfully launched a nuclear capable Submarine Launched Ballistic Missile (SLBM) in the Bay of Bengal with "very high accuracy".
	About INS Arihant:
	• It is India's first indigenous nuclear powered ballistic missile capable submarine.
	• Launched in 2009 and commissioned in 2016, it is built under the secretive Advanced Technology Vessel (ATV) project.
	• INS Arihant and its class of submarines are classified as 'SSBN', which is the hull classification symbol for nuclear powered ballistic missile carrying submarines.
	• INS Arihant can carry a dozen K-15 missiles on board.
	• While the Navy operates the vessel, the operations of the SLBMs from the SSBN are under the purview of India's Strategic Forces Command, which is part of India's Nuclear Command Authority.
	• In November 2019, after INS Arihant completed its first deterrence patrol, the government announced the establishment of India's "survivable nuclear triad" — the capability of launching nuclear strikes from land, air and sea platforms.
	• The second submarine in the Arihant class is SSBN Arighat which was launched in 2017.
	• In addition, India operates 15 conventional diesel electric submarines (classified as SSK), and some more are on the way.
	About SLBM:
	• The Submarine Launched Ballistic Missiles (SLBMs), sometimes called the 'K' family of missiles, have been indigenously developed by Defence Research and Development Organisation (DRDO).
	• The family is codenamed after Dr APJ Abdul Kalam, the centre figure in India's missile and space programmes who also served as the 11th President of India.
	• Because these missiles are to be launched from submarines, they are lighter, more compact and stealthier than their land-based counterparts, the Agni series of missiles which are medium and intercontinental range nuclear capable ballistic assets.
	• Part of the K family is the SLBM K-15, which is also called B-05 or Sagarika. It has a range of 750 km.
	• India has also developed and successfully tested K-4 missiles from the family, which have a range of 3,500 km.
	• The tests conducted were a key step towards ultimately deploying K-4s on the INS Arihant.

	• It is also reported that more members of K-family — reportedly carrying the code names K-5 and K-6, with a range of 5,000 km and 6,000 km respectively — are under development.

Salmonella and Salmonellosis	**Context:** The rapid and unselective use of traditional antibiotics gives rise to the emergence of drug resistant phenotype in typhoidal and non-typhoidal Salmonella serovars, which has increased the difficulties in curing Salmonella-induced food-borne illnesses (majorly typhoid or paratyphoid fever, gastroenteritis, and Diarrhea) worldwide.
	About Salmonella Typhimurium:
	
	• It is often associated with animals and animal products that are eaten.
	• Salmonella Typhimurium can be transferred to humans through raw or undercooked infected food including meat and eggs.
	• Salmonella Typhimurium causes gastroenteritis (inflammation of the gut).
	• Salmonella typhimurium ST313, an invasive non-typhoidal Salmonella serovar, causes bloodstream infection in the malnourished and immunocompromised population of sub-Saharan Africa.
	• Recent studies have reported the emergence of multi-drug resistant (MDR) phenotype in Salmonella typhimurium DT104, which causes infection in humans and cattle.
	• The continuous adaptation of this bacteria to the available antibiotics creates a risk of developing antimicrobial resistance in the future.
	About Salmonellosis:
	• Salmonellosis is an infection with a bacteria called Salmonella.
	• Salmonella live in the intestinal tracts of animals, including birds.
	• Salmonella are usually transmitted to humans by eating foods contaminated with animal faces.
	• Contaminated foods are often of animal origin, such as poultry, pork, beef, poultry, milk, or eggs, but all foods, including vegetables may become contaminated.
	• Thorough cooking kills Salmonella.
	• Commonly infected foods include:
	   o Raw meat, poultry and seafood
	   o Raw or undercooked eggs
	   o Unpasteurized dairy products
	   o Fruits and vegetables

MISCELLANEOUS

World's first CNG terminal	**Location:** At Bhavnagar, Gujarat
	A three-year-old project
	• Expected to infuse Rs 4,000 crore in developing the existing port infrastructure at
	• Special lock-gate system at Bhavnagar port
	    o The consortium will repair and redevelop the tidal lock gate system, which will be the fourth largest such system in the world.
	    o Traditionally, because of the higher tidal range of approximately 10 meters, Bhavnagar creek attracts a significant amount of sediment in the form of silt.
	    o This lock gate system has been set up so that a minimal amount of sediment enters the port basin during high tide, thus bringing down the cost of dredging inside the port substantially.
	Why is the Bhavnagar port important?
	• The Bhavnagar port is in close vicinity to the Dholer Special Investment Region (SIR) and is expected to serve the industries that set up bases in the region. It is already connected to the northern hinterland through a railway line that extends to the existing berths at the port.

Nobel Prize in Medicine 2022	**In News:** Nobel Prize for Physiology or Medicine 2022 has gone to Svante Paabo, a Swedish scientist based in Germany who is credited with developing new and innovative methodologies to extract 'clean' DNA from human fossils and for sequencing the Neanderthal genome. • Also discovered the existence of an unknown sub-species of the human family, now called Denisovans, who lived around the same time as the Neanderthals. • While it is possible to extract DNA samples from fossil remains, it can be extremely difficult, mainly because of the complications in collecting their DNA. • Similar but different techniques have been employed at the Rakhigarhi excavation project site in Haryana to find out about ancient populations in the Indian region. **Significance of the discovery:** • Earlier, scientists were studying the genomes of current human beings and extrapolating the information into the past through a method called deduction. This exercise is indirect and involves uncertainties. The new discovery has eliminated deductions, and relies on
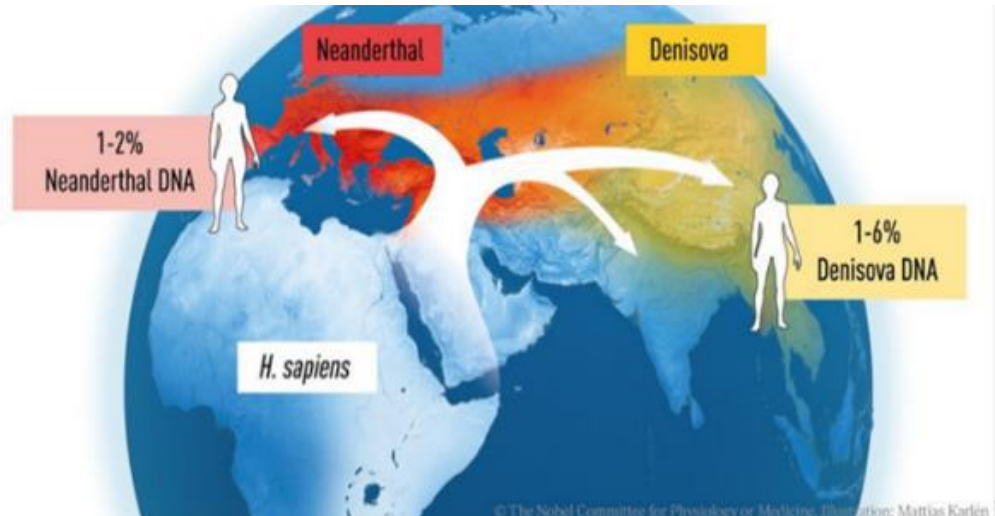
direct observation. For example, a particular skull bone, called petrous, preserves DNA better than the rest of the body.

- We now understand that archaic gene sequences from our extinct relatives influence the physiology of present-day humans. One such example is the Denisovan version of the gene EPAS1, which confers an advantage for survival at high altitude and is common among present-day Tibetans
- We now better understand human evolution and migration such as our understanding of how our immune system reacts to infections. In the 2020 paper, published in Nature, Paabo showed that one particular gene from the Neanderthals aggravated the risk of severe diseases among Covid patients.
- Establishment of an entirely new scientific discipline, paleo genomics.

Miscellaneous:

- Neanderthals are modern human's cousin species that went extinct about 30,000 years ago.
- Neanderthals and Denisovans co-existed for about 20,000 years, during which they not only interacted with each other, but also inter-bred.
- 'Neanderthal Man' is a book by Svante Paabo.
- 2021 recipients of Nobel Prize were David Julius and Ardem Patapoutian for their discoveries into how the human body perceives temperature and touch

About Nobel Prize:

- Nobel Prizes are a group of five separate prizes awarded to "those who have conferred the greatest benefit to humankind.
- Named after Alfred Nobel, a Swedish chemist, engineer, and industrialist most famously known for the invention of dynamite.
- Nobel Prizes were first awarded in 1901.
- The prizes carry a cash award of 10 million Swedish kronor (nearly $900,000).
- The money comes from a bequest left by the prime's creator, Alfred Nobel, who died in 1895.

Nobel Prize Chemistry 2022

In News: This year's Nobel Prize in Chemistry has gone to Carolyn Bertozzi and Barry Sharpless of the United States and Morten Meldal of Denmark who have made a strong case for adopting an alternative approach to producing new complex molecules, which minimizes waste and increases overall efficiency.

Nobel Prize for Chemistry 2022
"For the development of click chemistry and bioorthogonal chemistry"

Carolyn R. Bertozzi	Morten Meldal	Barry Sharpless*
American Born in 1966	Danish Born in 1954	American Born in 1941
Professor at Stanford University (USA)	Professor at University of Copenhagen (DEN)	Professor at Scripps Research, La Jolla (USA)

- Click chemistry: a robust method for building molecules, in widespread use including in the development of pharmaceuticals and for mapping DNA
- Bioorthogonal reactions: occur without disturbing the normal chemistry of the cell and used to improve targeting of cancer drugs, which are now being tested in clinical trials

Source: nobelprize.org   *2001 Nobel Chemistry laureate   AFP

About:

- Sharpless is the originator of the concept of 'Click Chemistry'.
- He found the first chemical reaction that satisfied the criteria for 'Click' reactions using a nitrogen-containing cyclic compound and discovered that use of copper as a catalyst eliminated the by-products.
- Carolyn Bertozzi in 2004 developed a few 'click' reactions that work inside living organisms.
- The name "Click", has been taken from the click sound that airline seat belts make when they are fastened.

- While trying to produce any particular compound or a complex molecule, one must look for starting molecules that easily react with each other or fit into each other, or 'click' with each other.
- The reacting molecules should be in a made-for-each-other kind of situation for this particular reaction.
- This makes the resultant chemical reaction more efficient.

Significance:
- Mimicking nature is expected to bring in effectiveness and sustainability in man-made processes and products as well.
- Vast potential in the pharmaceutical industry – The industry uses a lot of naturally occurring but industrially synthesized molecules. Every kilogram of a drug produced results in the generation of nearly 25-100 kg of chemical waste, making it inefficient.
- Bertozzi's methods have shown the promise of treating advanced cancer. Cancer drugs based on her approach are now undergoing clinical trials.

Nobel Peace Prize 2022	**In news:** The Nobel Peace Prize for 2022 has been awarded to Ales Bialiatski, Memorial group of Russia and Centre for Civil Liberties of Ukraine who stand against Russia and has made a statement towards Russia's war in Ukraine. **About Ales Bialiatski:** • He is a Belarus civil rights activist who promotes democracy and peaceful development in his country. • He has been held without trial in jail since 2021 and despite tremendous hardship, has not yielded in his fight for human rights. • He founded the Belarus human rights group Viasna (Spring) in 1995 to defend and expose violations of human rights and to build a just and free society. • He is a vocal critic of Putin's ally, President Alexander Lukashenko of Belarus. • Belarus's support to Russia – offered country's territory to Russian troops for launching attacks into Ukraine and its soldiers are said to have fought alongside Russian troops. **About Memorial group of Russia:** • It is the largest human rights organization in Russia and was shut down by Putin. • Its objective was to record atrocities committed during the communist regime, especially under Joseph Stalin. • It is based on the notion that confronting past crimes is essential in preventing new ones. It is the most authoritative source of information on political prisoners in Russian detention facilities, and also leads efforts to combat militarism. • It documents victims of the Stalinist era, and compiled information on political oppression and human rights violations in Russia. It highlighted war abuses and crimes by Russia in Chechen wars. • The organization was stamped as a "foreign agent" early on, and in December 2021, the Supreme Court ruled that it must be liquidated and the documentation centre shut permanently. **About Centre for Civil Liberties, Ukraine:** • Centre for Civil Liberties is a Ukrainian rights organization that is documenting alleged war crimes by Russia in Ukraine. • Founded in Kyiv in 2007 with the aim of advancing human rights and democracy in Ukraine, it has taken a stand to strengthen Ukrainian civil society and pressure the authorities to make Ukraine a full-fledged democracy. • It has actively advocated that Ukraine become affiliated with the International Criminal Court.

- Since Russia's invasion in February 2022, the Centre has engaged in efforts to identify and document Russian war crimes against the Ukrainian civilian population in collaboration with international partners

Significance:

- The Peace Prize winners represent civil society in their home countries.
- They have for many years promoted the right to criticize power and protect the fundamental rights of citizens.
- They have made an outstanding effort to document war crimes, human rights abuses and the abuse of power
- Together they demonstrate the significance of civil society for peace and democracy.
- This year's winners have revitalized and honoured Alfred Nobel's vision of peace and fraternity between nations — a vision most needed in the world today.

Methodology of Nobel Peace Prize:

- The Nobel Peace Prize has often mirrored current geopolitical choices of the West.
- The winner of the Peace Nobel is chosen by a committee of five persons selected by Norway's Parliament.
- The names of nominators and nominees cannot be divulged for 50 years.
- Among eligible nominators are members of national assemblies and national governments of sovereign states as well as current heads of state, and members of The International Court of Justice and The Permanent Court of Arbitration in The Hague.

Nobel Prize in Economics 2022	**In news:** The Economics Prize for 2022 has gone to Ben Bernanke, Douglas Diamond and Philip Dybvig for their research related to how banks function. - The foundations of this research were laid by them in the early 1980s. - Modern banking research clarifies the importance & vulnerabilities of banks, role of banks in the economy especially during a financial crisis. - Their analyses have been of great practical importance in regulating financial markets and dealing with financial crises. - The laureates' insights have played an important role in ensuring crises such as covid pandemic did not develop into new depressions with devastating consequences for society. **Ben S Bernanke:** - Bernanke demonstrated how failing banks played a decisive role in the global depression of the 1930s. The collapse of the banking system explains why the downturn was not only deep, but also long-lasting. - It added the importance of well-functioning bank regulation. - **Conflict:** savers want instant access to their money in case of unexpected outlays, while businesses and homeowners need to know they will not be forced to repay their loans prematurely. - This creates the fundamental problem of volatility in banks and vulnerability to shocks such as in case of bank runs. **Douglas W Diamond and Philip H Dybvi:** - The model captures the central mechanisms of banking, as well as its weaknesses. - They argue that banks emerge as natural intermediaries that help ease liquidity. - They discuss how banks need to be more careful about assessing the loans they give out, or how bailing out banks in crisis might turn out to be and how the financial markets should be regulated to fulfil their function – channelling savings to productive investments without causing recurring crises – is a question that researchers and politicians continue to wrestle with.

	• This reduces the risk of financial crises developing into long-term depressions with severe consequences for society, which is of the greatest benefit to us all.
Telecom Technology Development Fund scheme (TTDF)	**In news:** The scheme is launched by Universal Service Obligation Fund (USOF). **About:** • The scheme is aligned with the Prime Minister's clarion call of adding Jan Anusandhan in the new phase of Amrit Kaal. • The scheme entails grants to Indian entities to encourage and induct indigenous technologies tailor-made to meet domestic needs. **Objectives:** • Fund R&D in rural-specific communication technology applications • Form synergies among academia, start-ups, research institutes, and the industry to build and develop the telecom ecosystem. • Promote technology ownership and indigenous manufacturing • Create a culture of technology co-innovation, reduce imports, boost export opportunities • Creation of Intellectual Property. • Development of standards to meet countrywide requirements and create the ecosystem for research, design, prototyping, use cases, pilots, and proof of concept testing, among others. **About USOF:** • Universal Service Obligation Fund (USOF) is an attached office of the Department of Telecommunications (DoT), Ministry of Communications. • It was formed under the Indian Telegraph (Amendment) Act, 2003 giving it a statutory • It is headed by the Administrator, USO Fund who is appointed by the Central Government, for the administration of the fund.
Odisha's Millet Mission	**In News:** The state launched the Odisha Millet Mission (OMM), which aims to bring millets back to its fields and food plates by encouraging farmers to grow the crops that traditionally formed a substantial part of the diet and crop system in tribal areas. **About Odisha Millet Mission (OMM):** • To improve nutritional security and promote sustainable agricultural practices • OMM also sells millet products, such as cookies, savoury snacks, vermicelli and processed millets, under a brand called "Millet Shakti" through food trucks, cafés, kiosks and other outlets. **Green Revolution(GR):** • The Green Revolution within India commenced in 1968, during which agriculture in India was converted into a modern industrial system • Mainly led by agricultural scientist M. S. Swaminathan in India, this period was part of the larger Green Revolution endeavour initiated by Norman E Borlaug. **Features of GR:** • Introduction of new and high yielding variety of seeds including high disease resistance varieties so that production will enhance. • Increased use of fertilizers, pesticides and weedicides in order to reduce agricultural losses. • Use of latest agricultural machinery like tractor, seed drills, threshers and harvester. • Provision of irrigation facilities.
Sri Darbar Sahib (Golden Temple)	**In news:** Vice-President Jagdeep Dhankhar visited Sri Darbar Sahib in Amritsar. **The Golden Temple:** • Sri Harmandir Sahib is also known as Sri Darbar Sahib or Golden Temple.

- The Golden Temple was founded in 1574 by the fourth Sikh Guru, Guru Ram Das and was completed in 1604.
- Guru Arjan Sahib, the Fifth Nanak, conceived the idea of creating a central place of worship for the Sikhs and he himself designed the architecture of Sri Harmandir Sahib.
- The temple is built on the lower level and unlike Hindu Temples having only one gate for the entrance and exit, it is open from all four sides.
- It opens on to the causeway or bridge that leads to the main building. The bridge is connected with the 13 feet wide 'Pardakshna' (circumambulatory path).
- The ceiling of the temple is made with gold and precious stones.
- On the top of this room stands the low fluted '**Gumbaz' (dome)** having lotus petal motif in relief at the base inverted lotus at the top which supports the **"Kalash" having a beautiful "Chhatri"** at the end.
- The Temple organizes the largest 'langar sewa' (or community kitchen) in the world.

Operation Bluestar:

- Operation Blue Star was the codename of a military operation which was carried out by Indian security forces in 1984 in order to remove Damdami Taksal leader Jarnail Singh Bhindranwale and his followers from the buildings of the Golden Temple, Amritsar.
- The decision to launch the operation rested with the **Prime Minister of India, then Indira Gandhi.**
- **Operation Blue Star** was planned on the **martyrdom day of Guru Arjan Dev, the founder of the Harmandir Sahib.**

MAINS

POLITY & GOVERNANCE

Strengthening the CSR framework

Context: Ever since the establishment of the Corporate Social Responsibility (CSR) regime in India under Section 135 of the Companies Act 2013, CSR spending in India has risen from ₹10,065 crore in 2014-15 to ₹24,865 crore in 2020-21.

- But there is no data to verify whether this increase is commensurate with the increase in profits of Indian and foreign (having a registered arm in India) companies.

What is Corporate Social Responsibility?

- CSR is a concept that suggests that it is the responsibility of the corporations operating within society to contribute towards economic, social and environmental development that creates a positive impact on society at large.
- CSR in India is based on the Gandhian concept of Trusteeship.
- Trusteeship Philosophy is a socio-economic philosophy propounded by Mahatma Gandhi. It provides a means by which the wealthy people would be the trustees of trusts that looked after the welfare of the people in general.

Evolution of CSR in India:

- Companies Act, 2013 is a landmark legislation that made India the first country to mandate and quantify CSR expenditure. The inclusion of CSR is an attempt by the government to engage the businesses with inclusive growth, welfare and national development.
- CSR also promotes responsible and sustainable business philosophy at a broad level and encourages companies to come up with innovative ideas and robust management systems.
- Section 135(1) of the Act prescribes thresholds to identify companies which are required to constitute a CSR Committee – those, in the immediately preceding financial year of which:
  - ○ Net worth is Rs 500 Crore or more or
  - ○ Turnover is Rs 1000 Crore or more or
  - ○ Net profit amounts to Rs 5 Crore or more
- As per the Companies (Amendment) Act, 2019,CSR is applicable to companies before completion of 3 financial years.
- Companies are required to spend, in every financial year, at least 2% of their average net profits generated during the 3 immediately preceding financial years.
- For companies that have not completed 3 financial years, average net profits generated in the preceding financial years shall be factored in.
- The CSR activities in India should not be undertaken in the normal course of business and must be with respect to any of the 17 activities of CSR mentioned in Schedule VII of the act.

Evaluation of the working of CSR law in India:

- If a company spends an amount in excess of the minimum 2%, as stipulated, the excess amount is liable to be set off against spending in the succeeding three financial years.
- The latter proviso in the Act weakens the former provision since the requirement of 2% is only a minimum requirement. Ideally, companies should be encouraged to spend more than this.
- Besides, many private companies have registered their own foundations/trusts to which they transfer the statutory CSR budgets for utilization. It is unclear if this is allowed under the Companies Act/CSR rules.

Geographical bias of CSR:

- Section 135(5) of the Act says that the company should give preference to local areas/areas around it where it operates. However, this creates regional disparity.
  - For example, a report by Ashoka University's Centre for Social Impact and Philanthropy says that more than half of India's CSR companies are concentrated in 4 states Maharashtra, Tamil Nadu, Karnataka, and Gujarat while populous Uttar Pradesh and Madhya Pradesh receive little.
- An analysis of CSR spending (2014-18) reveals that while most CSR spending is in education, health and sanitation, only 9% was spent on the environment even as extractive industries such as mining function in an environmentally detrimental manner in several States.

Monitoring of CSR:

- Under the existing regulation, monitoring is by a board-led, disclosure-based regime, with companies reporting their CSR spends annually to the Corporate Affairs Ministry (MCA) through filing of an annual report. It is not known if there is a review of these reports and companies taken to task.
- The Standing Committee on Finance had also observed that the information regarding CSR spending by companies is insufficient and difficult to access.

Recommendations by the high-level committee on CSR (2018):
These should be incorporated in the current CSR framework to improve the existing monitoring and evaluation regime, including measures on:

- Strengthening the reporting mechanisms with enhanced disclosures concerning selection of projects, locations, implementing agencies etc.
- Bringing CSR within the purview of statutory financial audit with details of CSR expenditure included in the financial statement of a company
- Mandatory independent third-party impact assessment audits.
- CSR non-spend, underspend, and overspend should be qualified by the auditor in the audit report as a qualification to accounts, and not just as a note to accounts.

Way forward:

- There is a need to curate a national-level platform centralised by the MCA where all States could list their potential CSR-admissible projects so that companies can assess where their CSR funds would be most impactful across India with preferential treatment to areas where they operate.
- Invest India's 'Corporate Social Responsibility Projects Repository' on the India Investment Grid (IIG) can serve as a guide for such efforts.
  - This model would be very useful for supporting deserving projects in the aspirational districts and projects identified by MPs under the Government's Sansad Adarsh Gram Yojana.
- Companies need to prioritise environmental restoration in the area where they operate, earmarking at least 25% for environment regeneration.
- All CSR projects should be selected and implemented with the active involvement of communities, district administration and public representatives.
- The MCA and the line departments need to exercise greater direct monitoring and supervision over CSR spend by companies through the line ministries (for public sector undertakings) and other industry associations (for non-public units) instead of merely hosting all information on the Ministry's website.

The revamped CSR framework in India incorporating above recommendations would usher in a true trusteeship model.

Contract Farming Law

Context: The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, 2020 is an important legislative landmark in the context of Indian agricultural policy.

- The dramatic repeal of the three controversial farm laws in November 2021 provided a unique opportunity for policymakers to critically examine the calls for reforming India's agricultural marketing regulatory framework from a stakeholder point of view.
- A study critically examines the various provisions contained in the act to assess its potential in mitigating the key concerns of adopting the CF practice in India.

About contract farming:

- Contract farming can be defined as agricultural production carried out according to an agreement between a buyer and farmers, which establishes conditions for the production and marketing of a farm product or products.
- Typically, the farmer agrees to provide agreed quantities of a specific agricultural product. These should meet the quality standards of the purchaser and be supplied at the time determined by the purchaser.

Regulatory structure on contract farming in India:

- Initially, contract farming was regulated under the Indian Contract Act, 1872.
- The Model APMC (Agricultural Produce Market Committee) Act, 2003 provides specific provisions for contract farming, like compulsory registration of contract farming sponsors and dispute settlement.
- However, due to resistance from commission agents, States were lukewarm towards promoting Contract farming.
- In 2004, the MS Swaminathan-headed National Commission on Farmers (NCF) recommended the design and implementation of a comprehensive code of conduct on contract farming.
- The National Policy for Farmers 2007, based on the recommendations of NCF, also encouraged Contract farming practices and promised to prepare a code of conduct for contract farming.
- In February 2018, the Ministry of Agriculture came out with a draft Model Contract Farming Act, 2018. The draft Model Act seeks to create a regulatory and policy framework for contract farming. Based on this draft Model Act, legislatures of states can enact a law on contract farming
- Currently, contract farming requires registration with the Agricultural Produce Marketing Committee (APMC) in a few states. This means that contractual agreements are recorded with the APMCs which can also resolve disputes arising out of these contracts.

Benefits of Contract farming:

- Contract farming is looking towards the benefits both for the farm-producers as well as to the agro-processing firms. The key advantages are the
- Crop diversification; Higher crop yield; Reduction in price uncertainty; Better price and assured market for farmers; Increase in profit and income of farmers; Supply of quality farm inputs Including farm credit technology and scientific know-how to farmers; Reduction in transportation costs; Growth of food processing industry; Integration of farmers into the industry and global market.

Disadvantages of Contract farming:

- Neglect of small and marginal (S&M) farmers by firms,
- Dominant role by firms in price fixation,
- Delay in making payments to farmers,
- Non-purchase of contracted produce on quality and other grounds,
- Manipulation of grading standards,
- Breaking away from contracts by either party,
- Difficulty of legal enforcement of contracts,
- Lower long-term commitment among corporates for rural development.

Challenges:

- Contract farming arrangements are often criticized for being biased in favour of firms or large farmers, while exploiting the poor bargaining power of small farmers.

- Problems faced by growers like undue quality cut on produce by firms, delayed deliveries at the factory, delayed payments, low price and pest attack on the contract crop which raised the cost of production.
- Contracting agreements are often verbal or informal in nature, and even written contracts often do not provide the legal protection in India that may be observed in other countries.
- Lack of enforceability of contractual provisions can result in breach of contracts by either party.
- Single Buyer – Multiple Sellers (Monopsony).
- Adverse gender effects – Women have less access to contract farming than men.

Stakeholders views on contract farming:

- In the CF system, firms largely ignore smallholders to achieve economies of scale and reduce transaction costs.
- Therefore, the CF Act has opened the avenue for collective engagement among farmers with a provision to engage aggregators, including FPOs (Farmer Producer Organisations), in CF.
- A predominant section of the stakeholders surveyed, including three-fourths of the farmers, believed that the collectivisation of farmers through FPOs would help smallholders adopt CF.
- Three-fourths of the stakeholders supported the inclusion of these quality-related provisions in the CF legislation.
- However, farmers suggested arranging quality inspection in their presence and a scheme for educating them on quality standards.
- There are fears that the firms will exploit farmers in many ways, such as denying a say in price fixation, grabbing farmers' land, and treating farmers as bonded labourers.
- The CF Act stipulates that farmers can opt for a contract for one crop season or a mutually agreeable period. This provides freedom for farmers to change their choice of firms.
- Over half of the respondents, including farmers, agreed that a shorter contract period would enable farmers to escape exploitation by the firms.
- The CF Act stipulates that the prices may be determined in advance and indicated in the contract. If prices fluctuate, the agreement must include a guaranteed and reference/benchmark price.
- Compulsory registration would encourage written agreements and the entry of only serious players.
- Another suggestion supported by three-fourths of the stakeholders was the levy of a small facilitation fee on the firms and establishing a dedicated official agency to oversee and facilitate the working of the CF Act.
- The agency was expected to handhold the farmers through training and capacity-building programmes using the fee proceeds and bridge the trust deficit between farmers and firms.

Way Forward:

- The contract farming seeks to provide alternative marketing channels and better price realization to farmers.
- It has been observed that if the market price rises higher than the contracted price, the farmers are tempted to sell the produce to someone else for a higher price.
- On the other hand, if market prices were to fall below the contracted rate, the buyer often fails to honour the commitment.
- It is also necessary to remember that for growers agriculture is a livelihood issue and for processors and aggregators it is business.

Hence the Government should play the role of a facilitator to promote as well as to develop a healthy system of farmer-corporate relationship for mutual benefit and development of the agriculture sector in India.

Online gaming market in India

Context: An inter-ministerial task force, set up by the Ministry of Electronics and Information Technology (MeitY) to propose legislation to regulate online gaming under the purview of the Prevention of Money Laundering Act, 2002.

The online gaming market in India:

- e-Sports: These are video games that were played privately or on consoles in video game stores in the 1990s, but are currently played online in a structured manner between professional players, either individually or in teams.
- Fantasy sports: These are games in which the player selects a team of real sports players from several teams and earns points based on how well the players perform in real life. For example,
- Online casual games:
  o These could be skill-based, where the outcome is heavily impacted by mental or physical skill or chance-based, where the outcome is heavily influenced by some randomized activity, such as rolling a die.
  o A game of chance may be considered as gambling if players bet money or anything of monetary value.

Size of online gaming market in India:

- The Indian mobile gaming industry's revenue is predicted to exceed $1.5 billion in 2022 and reach $5 billion by 2025.
- Between 2017 and 2020, the industry in India increased at a compound annual growth rate (CAGR) of 38%, compared to 8% in China and 10% in the US.
- According to a FICCI report, transaction-based games revenue increased by 26% in India, while the number of paying players increased from 80 million in 2020 to 95 million in 2021 (by 17%).

Need for a central law to regulate online gaming:

- **Lack of regulatory oversight:**
  o Online gaming exists in a regulatory grey area and there is no comprehensive legislation with respect to its legality or its boundaries.
- Also, there is currently no regulatory framework to govern various aspects of online gaming companies such as –
  o Having a grievance redressal mechanism, Protection of data and intellectual property rights, and prohibiting misleading advertisements.
  o Online gaming is a state subject (Under Entry 34, List II 'Gambling' and 'Betting'):
- However, state governments have stated that it is extremely difficult for them to implement some restrictions, such as geo-blocking specific apps or websites within their state's borders.
- Societal concerns: A number of reported incidences of persons losing big amounts of money on online games, resulting to suicides in various parts of the country.

Recommendations of the task force:

- **Nodal ministry to regulate online gaming:**
  o The task force has suggested that MeitY may act as the nodal ministry to regulate online gaming, except for the e-sports category on which the Department of Sports can take the lead.
  o The Consumer Affairs Ministry can regulate the sector for unfair trade practices.
- **A central-level law for online gaming:**
  o This should apply to both real money and free games of skill, such as e-sports, online fantasy sports contests, card games, etc.
  o Casual games with no real money element in the form of stakes may be exempt from such rules unless they have a large number of users in India.
- **Creating a regulatory body for the online gaming industry:**
  o This body will establish what constitutes a game of skill or chance, and will certify various gaming forms, as well as pursue compliance and enforcement.
- **Establishing a three-tier dispute resolution mechanism:**
  o This will be similar to that prescribed under the Information Technology (IT) Rules, 2021 for online streaming services.
  o Bringing online gaming platforms under the scope of the Prevention of Money Laundering Act, 2002:
  o These platforms will also be treated as 'reporting entities' under the Act of 2002, and will be required to report suspicious transactions to the Financial Intelligence Unit-India.

- o This means that any online gaming platform (domestic or foreign) offering real money online games to Indian users will need to be a legal entity incorporated under Indian law.
- **Betting apps can be included under the proposed Digital India Law:**
  - o Many offshore betting and gambling websites which are illegal in India have become popular among Indian users, as they allow users to transact in Indian rupees through internet banking, UPI, and popular wallets.
  - o Despite being based outside India, some of these websites are widely advertised in Indian media.
- On the aspect of prohibiting games of chance (gambling websites or apps), the proposed Digital India Act (which would replace the IT Act) can include it in the list of prohibited user harms that will not be permitted.

Address Stigma and Discrimination in Mental Health

Context: The Lancet recently released a new report calling for radical action to end stigma and discrimination in mental health. The World Mental Health Day was also celebrated on October 10th.

About new Lancet Commission:

- It is a grouping of over 50 contributors across the world, including people, academics, policymakers with lived experience of mental health.

Highlights of the report:

- The report indicated that 90% of people living with mental health conditions feel negatively impacted by stigma and discrimination.
- Further, 80% said stigma and discrimination can be worse than the condition itself.
- Additionally, 90% of those surveyed felt that media could play a major role in reducing stigma.
- On 'stigma' associated with mental health:
- As per the commission, stigma can cause social exclusion and disempowerment of people with mental health conditions leading to discrimination and human rights violations, including problems in accessing healthcare, challenges in securing employment, and increased likelihood of health complications leading to early death.
- Women with a diagnosis of severe mental disorder and their family members do face more stigma which has ramifications for marriage and employment preventing social inclusion.

Report recommendations:

- Putting the involvement or participation of people with mental illness at the center of the matrix, the commission has urged governments, international organisations, schools, employers, healthcare, civil society and media to act immediately.
- For instance, it has been recommended that all countries take action to decriminalise suicide, therefore reducing the stigma around suicide and leading to fewer occurrences.

Determinants of Mental Health:

- Multiple social, psychological, and biological factors determine the level of mental health of a person at any point of time.
- For example, violence and persistent socio-economic pressures are recognized risks to mental health. The clearest evidence is associated with sexual violence.
- Poor mental health is also associated with: rapid social change, stressful work conditions, gender discrimination, social exclusion, unhealthy lifestyle, physical ill-health and human rights violations.
- There are specific psychological and personality factors that make people vulnerable to mental health problems. Biological risks include genetic factors.

Status of mental health in India:

- WHO estimates that about 7.5 percent of Indians suffer from some mental disorder and predicts that by the end of this year roughly 20 percent of India will suffer from mental illnesses.
- WHO states that there is a huge shortage of psychiatrists and psychologists in India.
- According to the numbers, 56 million Indians suffer from depression and another 38 million Indians suffer from anxiety disorders. India also accounts for 36.6 percent of suicides globally.
- A report published in The Lancet Psychiatry in February 2020 indicates that in 2017, there were 197.3 million people with mental disorders in India.

Various Government of India Initiatives:

Constitution and Legal Provisions:

- Article 21: The right to a dignified life extends to the right to seek Mental Health care.
- Article 47: Duty of the state to raise the level of nutrition and the standard of living and to improve public health.

National Mental Health Programme (NMHP) in 1982:

- To ensure the availability and accessibility of minimum mental healthcare for all in the foreseeable future, particularly to the most vulnerable and underprivileged sections of the population.

Mental Healthcare Act, 2017:

- It was passed in 2017, came into effect in May 2018 and replaced the Mental Health Act of 1987.
- To the joy of most Indian medical practitioners and advocates of mental health, the act decriminalised suicide attempts in India.
- It also included WHO guidelines in the categorisation of mental illnesses.
- The most significant provision in the act was "advanced directives", which allowed individuals with mental illnesses to decide the course of their treatment and also appoint someone to be their representative.
- It also restricted the use of electro-convulsive therapy (ECT), and banned its use on minors, finally introducing measures to tackle stigma in Indian society.

Rights of Persons with Disabilities Act, 2017:

- The Act acknowledges mental illness as a disability and seeks to enhance the Rights and Entitlements of the Disabled and provide an effective mechanism for ensuring their empowerment and inclusion in society

Mano Darpan Initiative:

- An initiative under Aatmanirbhar Bharat Abhiyan aims to provide psycho-social support to students for their mental health and well-being.

Kiran Helpline:

- The helpline is a giant step towards suicide prevention and can help with support and crisis management.
- The helpline aims to provide early screening, first-aid, psychological support, distress management, mental well-being, and psychological crisis management and will be managed by the Department of Empowerment of Persons with Disabilities (DEPwD).

SAATHI:

- It is a South-Asian Mental Health Outreach Program of ASHA International that aims to:
- Promote awareness about mental health and emotional wellbeing Improve access to care.

Way Forward:

- There is a need for more promotive programs & campaigns on mental health.
- The government should press more on allocating more funds in Mental Health Organisations.

Telecom industry in India

Context: With the launch of 5G services in the country at the Indian Mobile Congress 2022 on October 1, 2022 it is hoped the remarkable progress the telecom industry has made, especially in mobile services, will continue.

- It is indeed timely that the Department of Telecommunications (DoT) has released the draft Indian Telecommunications Bill 2022, replacing the age-old Indian Telegraph Act of 1885. However, though technology has evolved exponentially in the last decade, the draft Bill, disappointingly, lacks a vision for the future.

Brief details about telecom industry in India:

- The Telecom industry in India is the second largest in the world with a subscriber base of 1.17 billion as of July 2022.
- India has an overall tele-density of 85.11 %, with the tele-density of the rural market at 58.37% while that of the urban market is at 134.78%.
- By the end of December 2021, the total number of internet subscribers increased to 829.3 million (narrowband + broadband subscribers), out of which 37.25% of the internet subscribers belong to the rural areas.
- The number of broadband subscribers has increased to 807.42 million as of July 2022. The average monthly data consumption per wireless data subscriber has also increased by 22,605% to 14.97 GB in December 2021 from 61.66 MB in March 2014.
- The Telecom sector is the 3rd largest sector in terms of FDI inflows, contributing 6.44% of total FDI inflow, and contributes directly to 2.2 million employment and indirectly to 1.8 million jobs.
- 100% Foreign Direct Investment (FDI) has now been allowed in the Telecom sector under the automatic route.

Positive side of draft Indian Telecommunications Bill 2022:

- It is stated clearly that any revisions to the telecom policies, including licensing conditions and payment, will not have any retrospective effect. This provides certainty to the firms.
- Provisions related to verifiable identification of the calling party to be displayed to the receiver to limit the ubiquitous unsolicited commercial calls.
- The Bill recognises the optimal utilisation of radio spectrum for commercial mobile services and provides the way forward for spectrum trading, sharing, leasing and re-purposing in a technology-neutral manner.
- The opening up of the option for allocation to assign radio spectrum other than using auctions. This provides opportunities for the government to allocate spectrum using other methodologies such as administrative or beauty parades as applicable in specific use cases.
- The recognition of telecommunication facility providers and the associated Right of Way (ROW),{ the area around a pipeline or transmission line that is either government- or privately-owned for which you receive permission to work on} enable for the laying down of the passive infrastructure.
- The bill has also proposed that if a telecom entity in possession of spectrum goes through bankruptcy or insolvency, the assigned spectrum will revert to the control of the Centre.

Caveats in draft Indian Telecommunications Bill 2022:

Inclusion of Over the Top:

- Though the policy makers have attempted to re-define telecommunication services to include all forms of digital communication including Over the Top (OTT) communication and broadcasting services, the way in which this sector is addressed in the Bill severely lacks depth and vision.

Role of Telecom Regulatory Authority of India (TRAI):

- The total absence of any modification to the role of the Telecommunications Regulatory of Authority of India (TRAI), except for cosmetic changes to the TRAI Act 1997.
- The TRAI has done a remarkable job as the regulator of this dynamic technologically advanced sector for the past 25 years. The government must provide the much needed autonomy — both financially as well as administrative.
- The Regulator plays a very important role in shaping the digital communication landscape of the country. The only additional power that has been given to TRAI is the checking of predatory pricing in telecommunications which in fact is an antitrust action and should be in the Competition Commission of India's (SCCI) ambit and not TRAI.

Centre's overarching power:

- The Centre's overarching power to regulate all aspects of telecommunications in the interest of national security, without appropriate safeguards including the designation of authorities who can issue such orders. This is likely to send jitters to the service providers as well as consumers, so there is a need to clearly indicate the precautionary measures and processes to reduce possible misuse.

Sanctions and penalties:

- Granular level of details regarding sanctions and penalties in the Bill for deviating conduct of the service providers should be prescribed in the subsequent regulations and rules.

No provisions on cyber security:

- The draft Bill has no provisions on cyber security of either telecommunications or related infrastructure. This assumes more significance given the fact that India does not have a dedicated law on cyber security. Hence, it becomes even more essential to address issues concerning cyber security in telecommunications.

Way Forward:

- However, the Bill has only paid lip service to the fast evolving ecosystem. The Bill's scope should be expanded to address the newly emerging digital communications sector;
- The sector regulator's role also needs to be enhanced for appropriate coordination with other related regulators including the soon-to-be enacted Data Protection Authority, CCI and Consumer Protection Authority.
- The draft Bill represents an important step forward. But there is a need to address the various concerns of the stakeholders, both public and private, in the telecommunication ecosystem in order to enable the legislation to be more effective, relevant and topical.

Multi-State Cooperative Societies (Amendment) Bill, 2022

Context: Recently, the Union Cabinet approved the Multi-State Cooperative Societies (Amendment) Bill, 2022 after the announcement by the Union Cooperation Minister.

Provisions of the Amendment Bill 2022:

- **Incorporation of provisions of the 97th Constitutional Amendment Act 2011:**
  - Regarding constitutional status and protection to cooperatives and guarantees democratic and independent functioning of the cooperative societies.
- **Democratic governance:** The bill has provisions for setting up of cooperative election authority, cooperative information officer, cooperative ombudsman etc. to make governance of multi-state cooperative societies more democratic, transparent and accountable.
- **Reform electoral processes:** The cooperative election authority will ensure fair, free and timely elections and reduce electoral complaints and malpractices.
  - The Bill also provides for debarring offenders for three years, hence will bring in more electoral discipline.

- **Grievance redressal:** The cooperative ombudsman will set up a mechanism for grievance redressal of the cooperative societies members in a structured fashion.
- **Strengthen monitoring mechanisms:** The bill empowers the Central government to suspend the Board of a MSCS for fraud or embezzlement of funds or failure to conduct elections within a stipulated time.
    - It will also debar relatives of a sitting director to be recruited as an employee in the same cooperative.
- **Improved composition of the Board:** For promoting the professional management of the cooperatives, the bill has provisions-
    - To bring in co-opted directors with experience in the field of banking, management, cooperative management and finance.
    - The option of including the members having specialization in any field relating to the objects and activities undertaken by such multi-state cooperative society.
- **Enhance transparency and accountability:** The Bill proposes to appoint a Cooperative Information Officer who will enhance the transparency in functioning by providing the members timely access to information.
- To promote equity and facilitate inclusiveness, the bill includes provisions relating to representation of women and Scheduled Caste/Scheduled Tribe members on the board of multi-state cooperative societies.
- Improve ease of doing business: The amendment Bill proposes-
    - To reduce the period of registration, with a provision for the applicants to seek additional time of two months for rectification of mistakes.
    - For electronic submission and issuance of documents, thus providing for a comprehensive digital ecosystem.
- **Simpler registration:** Presently, India has nearly 800,000 cooperative societies of which around 1,600 are MSCS thus serve the interest of members in more than one state. For example, IFFCO, Kribhco and NAFED.
- **Increase financial discipline**: The bill provides for the Rehabilitation Fund for the revival of sick cooperatives and enables raising of funds in multi-state cooperative societies.
- **Regulation:** For cooperative banks, the banking functions will be governed by the Banking Regulation Act. However, all other operational issues will be regulated by the MSCS Act and its new amendments.

About Cooperative Societies in India:

- A co-operative society is a voluntary association of individuals having common needs who join hands for the achievement of common economic interest.
- Its aim is to serve the interest of the poorer sections of society through the principle of self-help and mutual help.

97th Constitutional Amendment Act 2011:

- It established the right to form cooperative societies as a fundamental right (Article 19).
- It included a new Directive Principle of State Policy on the Promotion of Cooperative Societies (Article 43-B).
- It added a new Part IX-B to the Constitution titled "The Co-operative Societies" (Articles 243-ZH to 243-ZT).
- It authorizes the Parliament to establish relevant laws in the case of multi-state cooperative societies (MSCS) and state legislatures in the case of other cooperative societies.
- Of the 1600 odd MSCS, the majority are in Maharashtra (570), followed by UP (150) and New Delhi (133).
- Credit cooperatives constitute the bulk of the MSCS (610), followed by agriculture-oriented MSCS (244).
- There are around 100 multi-state cooperative diaries and 70 multi-state cooperative banks.

About new Ministry of Cooperation:

- The Union Ministry of Cooperation was formed in 2021, its mandate was looked after by the Ministry of Agriculture before.
- Objectives of creation of the new ministry:
- To realize the vision of "Sahakar se Samriddhi" (prosperity through cooperation).
- To streamline processes for ''Ease of doing business'' for co-operatives and enable development of Multi-State Co-operatives (MSCS).

- To provide a separate administrative, legal and policy framework for strengthening the cooperative movements in the country.
- To deepen the cooperative as a true people-based movement reaching up to the grassroot level.

Way Forward:

- The Bill is expected to be introduced during the winter session of Parliament. The bill if passed will enhance transparency, accountability and improve ease of doing business for the cooperatives.
- The Union Cooperation Minister had also announced bringing in a new national cooperative policy for holistic management and success of cooperatives movement in India.

We Need True Social Enterprises

Context: Corporations with large financial resources and access to cutting-edge technologies can be a big force for change. However, only a few corporations are good corporate citizens who show care for society and the environment through consistent actions and "CSR".

- The business corporations are given the protection of limited liability in order to produce returns for their investors but these corporations considered people and the planet as only the resources for profits, and citizens as merely the customers or workers.
- They try to maximize their profit by the exploitation of consumers and workers, and the relentless extraction of resources of 'commons' that are at least cost to them.
- In this corporate culture, government regulations on wages and employment, and to protect natural resources, are considered impediments to 'ease of doing business'.
- Corporations are not fully responsible citizens of society.
- They "give back" only small portions of their profits as CSR and philanthropy i.e., only small fractions of the resources they take, or borrow, from society and nature for producing trillions of dollars of revenues are invested for the common welfare.

About Social Enterprise:

- It is a structure that combines the notion of a business with the principles of a philanthropic non-profit organization.
- The entire investment is focused on the social and environmental mission, which aids in the success of economic efforts.
- As change agents who use novel ideas to produce major change, social entrepreneurs are often referred to as social innovators.

Features of a social enterprise:

- Have a clear public or community mission (social, environmental, cultural or economic) that is part of the governing documents.
- Generate the majority of its income through business activities.
- Reinvest the majority of its profits into achieving the public / community mission.

Earth for All: A Survival Guide for Humanity- Systemic solutions for improving people, the planet, and profit:

- This guide produced collaboratively by economists, ecologists, and social scientists provides systemic solutions for improving people, the planet, and profit.
- Following the Club of Rome, it provides for a 'whole system' model which includes feedback loops between the economy, the natural environment, and social systems incorporating empirical data from diverse sources, and thus, this model of an economy is not a closed system.

- The model projects outcomes if the present pattern of solutions continues and compares them with an alternative approach to accelerate systemic change.
- It has given the concept of 'Too Little Too Late' and 'Big Leap' approaches followed by the economies around the world.

Too Little Too Late Approach:

- The present path is called "Too Little Too Late" wherein the businesses are making the world miserable for the next generation for present gains and thus it will ultimately lead to environmental and societal collapse later this century
- The approach includes lots of "do-gooding" and "green washing" with insufficient systemic change.
- It preserves the present inequitable distribution of wealth and power.
- The model forecasts that by 2050, on its present trajectory, India will be the most unequal society in the world).

Big Leap Approach:

- Big Leap evolves a more equitable distribution of economic wealth and social power and it avoids the need for disruptive political revolutions.
- It can prevent catastrophe and does not require new technology breakthroughs.

Solutions for reconnecting corporations as citizens of society:

Citizens Fund:

- It is an innovative solution proposed in Earth for All where the citizens and the Corporations using the "commons" for private purposes must pay all other citizens rent for using their shared resources.
- Although the Governments use taxes levied on corporations for the welfare schemes of citizens but on account of inefficiency in spending this money by the government, citizens resist tax increases.
- Contrary to this, payments into the Citizens Fund will not go into the government's account and thus, these will be paid as dividends directly and equally to all citizens to use as they will.
- This is like Universal Basic Income (UBI) which is expected to be paid out of government revenues.
- Since wealthy citizens and corporations are reluctant to pay more taxes, UBI becomes unviable whereas payments into the Citizens Fund will be made only by those who use common resources which is easier to justify morally.

Different forms for implementing the concept of Citizens Fund:

- One variation is to pay the "rent" for using community resources to self-governing community organisations, rather than to individual citizens.
- That way, the funds can be used for community purposes and can go back into the nurturing of common resources. For instance, the funds can go to village panchayats.

Changes in the forms and accounting practices of corporations:

- Corporations must become better citizens by becoming accountable to all stakeholders for the impacts of their operations and products.
- Presently, they are legally required to account only to their shareholders and those who provide finance whereas corporate accounting to society for the use of society's resources is voluntary.
- Legally mandated changes are required for businesses to account for use of the commons.

Need for a social enterprise:

- The concept of "social enterprise" is gaining some traction and they are known as 'social 'as their products are "greener".

- The "for profit" corporations also limit profit levels in their charters. However, the governance of these corporations remains largely controlled by investors.
- The purpose of a societal enterprise is to be a trustee of the commons and to serve the community.
- A truly "societal enterprise" will be governed by all its principal stakeholders and the design of its governance must ensure this.
- It must be accountable to all stakeholders in order to fulfil its duties as a responsible citizen.

Way Forward:

- Social enterprises act as influential drivers for the sustainability transition.
- However, other individuals and businesses should also consider playing their part and become recognized as contributors to a better world.
- The reach of many social enterprises is often limited by their lack of resources.
- Thus, the Corporations should therefore look for more opportunities for collaboration and partnerships and dedicating funds to strengthen influencing capacity.

National Credit Framework

Context: Recently, the Government of India unveiled the draft National Credit Framework (NCrF) to enable the integration of academic and vocational domains.

About National Credit Framework:

- National Credit Framework is a next generation, multidimensional instrument under National Education Policy (NEP).
- **Aim**: To formulate a unified credit accumulation and transfer for general and vocational studies, and from school to higher education.
- **Formulated under:** UGC (Establishment and Operation of Academic Bank Of Credits in Higher Education) Regulations, notified in July 2021.
- **Credits for School Students:** While the National Institute of Open Schooling (NIOS) follows a credit system, currently there is no established credit mechanism for regular school education in the country.
- **Integration of All Frameworks**: Besides, frameworks for higher education and skill education are currently not integrated, and the proposal is to integrate all frameworks, including the one at school level, under one umbrella.
- NCrF will seamlessly integrate the credits earned through school education, higher education and vocational and skill education by encompassing the National Higher Education Qualification Framework (NHEQF), National Skills Qualification Framework (NSQF) and National School Education Qualification Framework (NSEQF).
- **Aadhaar-enabled Student Registration:** There are plans to conduct an "Aadhaar-enabled student registration" drive where student registration will take place.
- **Academic Bank of Credits (ABC):** After student registration, an Academic Bank of Credits (ABC) account will be opened, where credits can be deposited. The deposit of degree and credits will take place in those accounts.
- **Knowledge Locker**: There will be a knowledge locker along the lines of Digilocker.

Proposed Credit Regime under NCrF:

- At the school level: The draft NCrF proposes that the credit regime be divided into five levels:
- from pre-school to class II;
  - classes III to V;
  - classes VI to VIII;
  - classes IX to X; and
  - classes XI and XII – A student who clears class XII will be at credit level 4.
  - Under the draft framework, the credit points will be carried over to the graduation level, and further.
  - A student will have to earn at least 40 credits for completing each year of school, besides clearing the exams.
  - The annual "notional learning" duration to earn at least 40 credits has been fixed at 1,200 hours — these will be not just time spent in classrooms but also a range of extracurricular activities and sports.

- o It may include yoga, other physical activities, performing arts, music, social work, NCC, vocational education, as well as on-the-job training, internships or apprenticeships, among others.
  - At the higher education level:
    - o The credit levels will range between 4.5 and 6 at four-year courses at undergraduate level, followed by the post-graduation level (between level 6 and 7).
    - o The framework has provisions of credit levels going up to 8 for those who obtain doctorate degrees.

Need for NCrF:

- To open numerous options for further progression of students.
- To ensure inter-mingling of school and higher education with vocational education and experiential learning.
- To prepare the educational system for gradual implementation of National Education Policy provisions such as the four-year undergraduate programmes, which comes with features such as multiple entry and exit.
- To enable students who have dropped out of mainstream education to re-enter the education ecosystem.

Proposed Benefits for Various Stakeholder:

For Students

- Ensuring Flexibility in the duration of study/ courses through provisions of multiple entries and exit/work options
- Paving the path for creditisation of all learning hours, including academic, vocational and experiential learning.
- Provision for lifelong learning – anytime anywhere learning
- Establishing multidisciplinary and holistic education with flexible curricula
- Removing the hard distinction between the education stream and making study choices respectful, allowing for more than one award in the same period
- Removing the distinction between arts, science, social sciences, commerce, etc
- Giving student credits for every academic/ skill/ experience
- Enhancing the scope of core learning to include foundational and cognitive values.

Institutions:

- Unification of higher education institutions to promote multidisciplinary education, creating a diverse and rich students' knowledge base
- Promoting stronger collaboration between institutions
- Making credit mechanism simpler and uniform
- Increasing focus on research and innovation
- Promoting digital learning, blended learning, and open distance learning
- Leveraging the institutional infrastructure

Government:

- Assisting the government to increase the enrolment of students
- Helping to fulfil the national vision of complementing the demographic dividend
- Transforming India into the Skill Capital of the World
- Making vocational education and training/ skilling aspirational
- Highly educated and trained workforce for Aatmanirbhar Bharat

Industry:

- Allowing students to attain NSQF-approved foundational skills developed by industry and be more employable
- Provision of micro-credentials to allow integration of quick educational upgradation/ up-skilling
- Re-Skilling and up-skilling of existing employees/ engineers
- Making students more employable by enabling a more holistic design of the study

- Creating a multi/ cross-sectoral skilled pool of employable youth

Way Forward:

- India is adopting technology at an unprecedented pace. There is a need to bring reforms to incentivise knowledge, skills & experience.
- Credits for knowledge acquisition, hands-on training, and positive social outcomes will be a key step for achieving 100% literacy in the next 2-3 years.
- All institutions, schools, ITIs, AICTE-affiliated engineering colleges, centrally-funded HEIs, state universities and regulatory authorities/bodies should host the public consultation for NCrF on their website for seeking suggestions from citizens.
- It also supports educational acceleration for students with gifted learning abilities and Recognition of Prior Learning for the workforce that has acquired knowledge and skills informally through the traditional family inheritance, work experience or other methods.

Contract Farming Law

Context: The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, 2020 is an important legislative landmark in the context of Indian agricultural policy.

- The dramatic repeal of the three controversial farm laws in November 2021 provided a unique opportunity for policymakers to critically examine the calls for reforming India's agricultural marketing regulatory framework from a stakeholder point of view.
- A study critically examines the various provisions contained in the act to assess its potential in mitigating the key concerns of adopting the CF practice in India.

About contract farming:

- Contract farming can be defined as agricultural production carried out according to an agreement between a buyer and farmers, which establishes conditions for the production and marketing of a farm product or products.
- Typically, the farmer agrees to provide agreed quantities of a specific agricultural product. These should meet the quality standards of the purchaser and be supplied at the time determined by the purchaser.

Regulatory structure on contract farming in India:

- Initially, contract farming was regulated under the Indian Contract Act, 1872.
- The Model APMC (Agricultural Produce Market Committee) Act, 2003 provides specific provisions for contract farming, like compulsory registration of contract farming sponsors and dispute settlement.
- However, due to resistance from commission agents, States were lukewarm towards promoting Contract farming.
- In 2004, the MS Swaminathan-headed National Commission on Farmers (NCF) recommended the design and implementation of a comprehensive code of conduct on contract farming.
- The National Policy for Farmers 2007, based on the recommendations of NCF, also encouraged Contract farming practices and promised to prepare a code of conduct for contract farming.
- In February 2018, the Ministry of Agriculture came out with a draft Model Contract Farming Act, 2018. The draft Model Act seeks to create a regulatory and policy framework for contract farming. Based on this draft Model Act, legislatures of states can enact a law on contract farming
- Currently, contract farming requires registration with the Agricultural Produce Marketing Committee (APMC) in a few states. This means that contractual agreements are recorded with the APMCs which can also resolve disputes arising out of these contracts.

Benefits of Contract farming:

- Contract farming is looking towards the benefits both for the farm-producers as well as to the agro-processing firms. The key advantages are the

- Crop diversification; Higher crop yield; Reduction in price uncertainty; Better price and assured market for farmers; Increase in profit and income of farmers; Supply of quality farm inputs Including farm credit technology and scientific know-how to farmers; Reduction in transportation costs; Growth of food processing industry; Integration of farmers into the industry and global market.

Disadvantages of Contract farming:

- Neglect of small and marginal (S&M) farmers by firms,
- Dominant role by firms in price fixation,
- Delay in making payments to farmers,
- Non-purchase of contracted produce on quality and other grounds,
- Manipulation of grading standards,
- Breaking away from contracts by either party,
- Difficulty of legal enforcement of contracts,
- Lower long-term commitment among corporates for rural development.

Challenges:

- Contract farming arrangements are often criticized for being biased in favour of firms or large farmers, while exploiting the poor bargaining power of small farmers.
- Problems faced by growers like undue quality cut on produce by firms, delayed deliveries at the factory, delayed payments, low price and pest attack on the contract crop which raised the cost of production.
- Contracting agreements are often verbal or informal in nature, and even written contracts often do not provide the legal protection in India that may be observed in other countries.
- Lack of enforceability of contractual provisions can result in breach of contracts by either party.
- Single Buyer – Multiple Sellers (Monopsony).
- Adverse gender effects – Women have less access to contract farming than men.

Stakeholders views on contract farming:

- In the CF system, firms largely ignore smallholders to achieve economies of scale and reduce transaction costs.
- Therefore, the CF Act has opened the avenue for collective engagement among farmers with a provision to engage aggregators, including FPOs (Farmer Producer Organisations), in CF.
- A predominant section of the stakeholders surveyed, including three-fourths of the farmers, believed that the collectivisation of farmers through FPOs would help smallholders adopt CF.
- Three-fourths of the stakeholders supported the inclusion of these quality-related provisions in the CF legislation.
- However, farmers suggested arranging quality inspection in their presence and a scheme for educating them on quality standards.
- There are fears that the firms will exploit farmers in many ways, such as denying a say in price fixation, grabbing farmers' land, and treating farmers as bonded labourers.
- The CF Act stipulates that farmers can opt for a contract for one crop season or a mutually agreeable period. This provides freedom for farmers to change their choice of firms.
- Over half of the respondents, including farmers, agreed that a shorter contract period would enable farmers to escape exploitation by the firms.
- The CF Act stipulates that the prices may be determined in advance and indicated in the contract. If prices fluctuate, the agreement must include a guaranteed and reference/benchmark price.
- Compulsory registration would encourage written agreements and the entry of only serious players.
- Another suggestion supported by three-fourths of the stakeholders was the levy of a small facilitation fee on the firms and establishing a dedicated official agency to oversee and facilitate the working of the CF Act.
- The agency was expected to handhold the farmers through training and capacity-building programmes using the fee proceeds and bridge the trust deficit between farmers and firms.

Way Forward:

- The contract farming seeks to provide alternative marketing channels and better price realization to farmers.
- It has been observed that if the market price rises higher than the contracted price, the farmers are tempted to sell the produce to someone else for a higher price.
- On the other hand, if market prices were to fall below the contracted rate, the buyer often fails to honour the commitment.
- It is also necessary to remember that for growers agriculture is a livelihood issue and for processors and aggregators it is business.

Hence the Government should play the role of a facilitator to promote as well as to develop a healthy system of farmer-corporate relationship for mutual benefit and development of the agriculture sector in India.

ECONOMY

Organic Farming

Introduction: Considering the genetic altering impact on the human body and biodiversity loss, reduction in pesticide usage i.e., Chemical farming should have become an Indian government's priority long ago.

- With reference to Indian agriculture, we will discuss organic farming for sustainable and stable development over chemical farming in detail:

What is organic Farming?

- As per the United States Department of Agriculture (USDA) organic farming is a system which largely excludes the use of synthetic inputs (fertilizers, pesticides, etc.) and relies upon crop rotations, crop residues, animal manures, organic waste, and biological system of nutrient mobilization.
- Organic farming system in India is not new and has been followed from ancient times.
- Currently India ranks 33rd in terms of total land under organic cultivation and 88th in terms of the ratio of agricultural land under organic crops to total farming area.

What are the principles adopted in Organic Farming in India?

- Organic agriculture grows and develops with these principles. These can contribute to improving organic agriculture for the world.
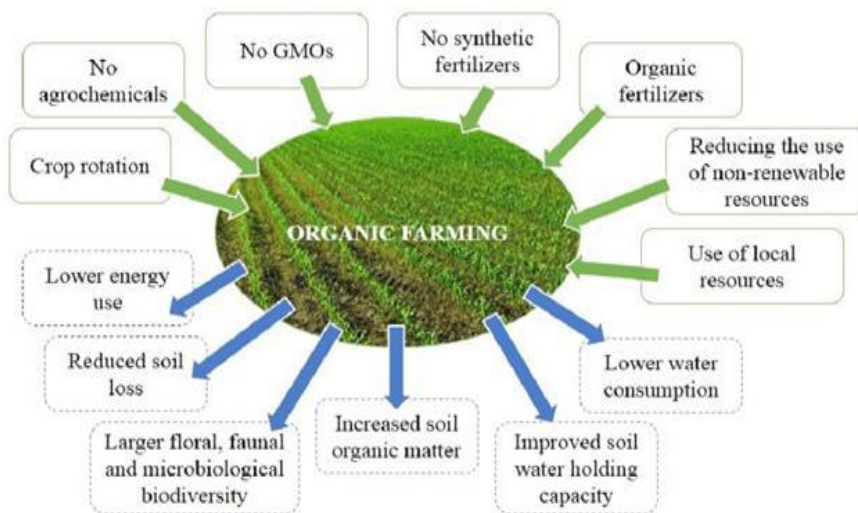
- There are four principles of organic farming are as follow:-
  o Principles of Health – The health of the ecosystem, people, and communities.
  o The Principles of Ecology – The right balance between ecosystem and environment or nature.
  o Principles of Fairness – Good human relationships and quality of life.
  o Principles of Care – The considerations about the environment and environment of the future.

Need of encouraging the use of organic farming in India:

- **Unsustainable conventional agriculture**: The ill effects of the conventional farming system are felt in India in terms of the unsustainability of agricultural production, environmental degradation, health and sanitation problems, etc. Organic agriculture is needed as an alternative method to the modern system.
- **Agricultural productivity:** The fertilizer and pesticide consumption has increased manifold but this trend has not been reflected in the crop productivity to that extent during the green revolution.
  o Organic farming has the potential of increased productivity in the long term due to better soil conditions and ecosystems.
- **Rising population**: With the increase in population there is a need to increase agriculture production further in a sustainable manner. The scientists have realized that the 'Green Revolution' with high input use has reached its peak and is now diminishing returns. Thus, a sustainable organic alternative is needed.

- **Employment Opportunities:** According to many studies, organic farming requires more labour input than the conventional farming system. India which has a very large amount of labour unemployment and underemployment can generate agricultural jobs through organic farming in rural areas.
- **Healthy food:** Several indirect benefits from organic farming are available to both the farmers and consumers.
  - While the consumers get healthy foods with better taste and nutritive values, the farmers are indirectly benefited from healthy soils and farm production environments.
- **Eco-tourism:** Eco-tourism is increasingly becoming popular and organic farms have turned into such favourite spots in many countries like Italy.
  - Organic farming adds to the beauty of the fields and provides protection to the ecosystem, flora, fauna with increased biodiversity and the resulting benefits to all human and living beings.

Challenges in Organic Farming in India:

- **Shortage of Biomass:** experts are not sure whether all the nutrients with the required quantities can be made available by the organic materials. Even if this problem can be surmounted, they are of the view that the available organic matter is not simply enough to meet the requirements
- **Disparity of Supply and Demand**: Non-perishable grains can be grown anywhere and transported to any location but this is not the case with fruits and vegetables.
- **Time**: organic farming requires greater interaction between a farmer and his crop for observation, timely intervention and weed control for instance.
- **High MRP:** It is almost obvious that due to the extreme care taken to go along with organic farming, the results would be kept at a high price.
- **Lack of special infrastructure:** Most large organic farms still operate in an industrialized agriculture style, including industrial transportation of the food from field to plate. Unfortunately, this involves the adoption of the same environmentally harmful practices as those of factory farms which are however hidden under the cover of being organic

Important Government Initiatives/Schemes:

- Paramparagat Krishi Vikas Yojana: promotes cluster based organic farming with PGS (Participatory Guarantee System) certification. Cluster formation, training, certification and marketing are supported under the scheme.
- Rashtriya Krishi Vikas Yojana: Assistance for promotion of organic farming on different components are also available with the approval of State Level Sanctioning Committee
- One District – One Product: The programme aims to encourage more visibility and sale of indigenous and specialized products/crafts of Uttar Pradesh, generating employment at the district level.
- National Mission on Oilseeds and Oil Palm: Financial assistance is being provided for different components including bio-fertilizers, supply of Rhizobium culture/Phosphate Solubilising Bacteria (PSB)/Zinc Solubilising Bacteria (ZSB)/ Azotobacter/Mycorrhiza and vermin-compost.
- The Organic Farming Action Programme: The objective is to promote and significantly develop organic farming by means of priority measures
- Food Safety and Standards Authority of India(FSSAI) is the food regulator in the country and is also responsible for regulating organic food in the domestic market and imports.
- Participatory Guarantee System (PGS): PGS is a process of certifying organic products, which ensures that their production takes place in accordance with laid-down quality standards.
- PGS Green is given to chemical free produce under transition to 'organic' which takes 3 years. It is mainly for domestic purposes.
- National Program for Organic Production (NPOP): NPOP grants organic farming certification through a process of third-party certification for export purposes.

Way Forward:

- Unsustainable agricultural practices have proved to be harmful for land, soil and farmers in general. A switch to organic farming can not only help to achieve sustainable agricultural production but would help farmers with a rise in income and production.
- An emphasis should be given to organic farming. Sikkim is being such a state to recognise it early and becoming a 100% organic state. Other states should work for the same.

Food Innovation Hubs

Context: Recently the World Economic Forum (WEF) is bringing together a network called 'Food Innovation Hubs'.

What are Food Innovation Hubs?

- Food Innovation Hubs are a multistakeholder, precompetitive and market-based partnership platform
- These platforms will leverage the role of technology and broader innovations in support of a transformation agenda.
- It will lead to more inclusive, efficient, sustainable, nutritious, and healthy food systems.
- The Food Innovation Hubs are founded by partners from governments, private sector, innovators, entrepreneurs, farmer organizations, civil society, international organizations and others.
- The Hubs are designed locally to address the needs of the local food system to
- Foster and cultivate food systems innovation
- Support delivery and adoption of innovations at scale
- Develop a community of practice to share learnings and build capacity

Promoting innovations:

- The first hub in India is being set up in Madhya Pradesh under a collaboration agreement between the WEF and Madhya Pradesh government.
- The hub which is based on agricultural development will promote innovations in alignment with tenets of the Atma Nirbharta.
- The Food Innovation Hub in India aspires to enable a mechanism that can strengthen local innovation ecosystems and address needs across the food value chains using technology and innovation.

Setting up and operating FIHs:

- Any hub is set up with close cooperation of local government and private sectors to meet its goals.
- There is no direct funding from the WEF for initiating projects under the hub.
- The hub enables the Public Private Partnership (PPPs) by roping in aggrotech companies and linking them with government agencies such as Krishi Vigyan Kendras etc.
- The innovation hubs depend on one another for knowledge exchange with a Global Coordinating Secretariat in Holland.
- It ensures that every hub is functioning as per global objectives, besides acting as a stimulant.

Proof of concept is essential:

- Any FIH will proceed only after the firms involved create a proof of concept with the government.
- Madhya Pradesh was chosen for initiating the hub's work as it was open to exploring opportunities transparently and collaboratively.
- Various aggrotech firms can be part of a project providing a variety of cutting-edge solutions
- Pledge financing through fintech modalities
- Using spectrometers to perform quality assaying
- Using remote sensing to providing advisories
- Facilitating efficient crop insurance.

- Besides aggrotech firms, not-for-profit companies are also involved to enhance the reach and credibility of digital innovations at the last mile.

What are the focus areas of the FIHs?

- The Food Innovation Hubs will focus on many facets of food processing and agriculture such as
  - New age digital agriculture
  - Innovations in regenerative farming
  - New age agro-ecological solutions.
- It will look at several modern and traditional models to address climate resilience.
- It looks at upcoming innovations in carbon offsets whose implementation is critical to providing financial incentives to the farmers to grow more sustainably.

Leveraging Carbon credits:

- The carbon credit market is becoming big globally and India can benefit with a well thought out execution plan.
- There are existing firms and new ones who run business operations that aim to pass on the benefits of protecting ecosystem services to farmers
- Other new age innovations include the usage of targeted soil and crop management through drones.
  - Spraying of bio-chemicals on fresh produce that may enhance shelf life and thus arrest food loss.
- These are conducive to the environment and support nutrition and health in the long term.
- The initiative aims to facilitate pilot projects to validate and test innovations, particularly by aggrotech companies, and support them in achieving scale and amplification in the future.

Way Forward:

- The FIHs can be financed through unconventional sources such as philanthropic funds.
- These funds are looking to unlock the PPPs by
  - Providing initial funding, particularly in achieving proof of concepts.
  - Philanthropic partners are an integral part of initiating and accelerating ecosystem transformation
- A growing set of global players from the private and public sector drive and support this exciting initiative.
- Once India's Food Innovation Hub builds a solid ground in the targeted places it will be a game changer for leveraging agriculture sector
- Therefore, its successful implementation presents opportunities which can be carried out in other states such as Odisha, Bihar and Meghalaya etc.

About World Economic Forum:

- The World Economic Forum (WEF) is a non-profit foundation.
- It was established in 1971 and is based in Geneva, Switzerland.
- It is recognized by the Swiss authorities as the international institution for public-private cooperation.

Mission:

- It is committed to improving the state of the world by engaging business, political, academic, and other leaders of society to shape global, regional, and industry agendas.
- **Some major reports published by WEF are:**
  - Global Gender Gap Report.
  - Global Risk Report.
  - Energy Transition Index.
  - Global Competitiveness Report.
  - Global IT Report
  - Global Travel and Tourism Report.

Pilot launch of e-rupee for specific use cases

Context: Recently, the Reserve Bank of India (RBI) indicated that it will soon commence limited pilot launches of e-rupee (e`), or Central Bank Digital Currency (CBDC) or digital rupee, for specific use cases.

About E-rupee:

- E-rupee is the same as a fiat currency and is exchangeable one-to-one with the fiat currency.
- Only its form is different.
- It can be accepted as a medium of payment, legal tender, and a safe store of value.
- The digital rupee would be exchangeable one-to-one as a liability on a central bank's balance sheet.

What are the types of e-rupees?

Based on the usage and the functions performed by the digital rupee and considering the different levels of accessibility, CBDC can be demarcated into two broad categories

- **General purpose (retail) (CBDC-R)**
    - Retail CBDC is an electronic version of cash primarily meant for retail transactions.
    - It will be potentially available for use by all — private sector, non-financial consumers, and businesses — and can provide access to safe money for payment and settlement as it is a direct liability of the central bank.
- **Wholesale (CBDC-W)**
    - Wholesale CBDC is designed for restricted access to select financial institutions.
    - It has the potential to transform the settlement systems for financial transactions undertaken by banks in the government securities (G-Sec) segment, inter-bank market and capital market more efficiently and securely in terms of operational costs, use of collateral and liquidity management.

Forms of CBDC:

- The central bank says e-rupee, or CBDC, can be structured as token-based or account-based.
- A token-based CBDC would be a bearer instrument like banknotes, meaning whosoever holds the tokens at a given point in time would be presumed to own them.
- In a token-based CBDC, the person receiving a token will verify that his ownership of the token is genuine.
- A token-based CBDC is viewed as a preferred mode for CBDC-R as it would be closer to physical cash.
- An account-based system would require maintenance of record of balances and transactions of all holders of the CBDC and indicate the ownership of the monetary balances.
- In this case, an intermediary will verify the identity of an account holder.
- This system can be considered for CBDC-W.

Model for issuance:

There are two models for issuance and management of CBDCs under the RBI's consideration:

- **Direct model (single tier model)**
    - In the direct model, the central bank will be responsible for managing all aspects of the digital rupee system such as issuance, account-keeping, and transaction verification.
- **Indirect model (two-tier model)**
    - An indirect model would be one where the central bank and other intermediaries (banks and any other service providers), each play their respective role.
- In this model, the central bank will issue CBDC to consumers indirectly through intermediaries and any claim by consumers will be managed by the intermediary.

What are the advantages of e-rupee?

- Reduction in operational costs involved in physical cash management
- Fostering financial inclusion
- Bringing resilience, efficiency, and innovation in the payments system
- It will add efficiency to the settlement system
- Boost innovation in cross-border payments space
- Provide the public with uses that any private virtual currencies can provide, without the associated risks.

Can e-rupee be transacted in offline mode?

- The offline functionality as an option will allow CBDC to be transacted without the internet and thus enable access in regions with poor or no internet connectivity.
- It will also create digital footprints of the unbanked population in the financial system, which will facilitate the easy availability of credit to them.
- In the offline mode, the risk of 'double-spending' will exist because it will be technically possible to use a CBDC unit more than once without updating the common ledger of CBDC.
- But it can be mitigated to a larger extent by technical solutions and appropriate business rules including monetary limits on offline transactions.

About Fiat Money:

- Fiat money is a government-issued currency that is not backed by a physical commodity, such as gold or silver, but rather by the government that issued it.
- The value of fiat money is derived from the relationship between supply and demand and the stability of the issuing government, rather than the worth of a commodity backing it.
- Most modern paper currencies are fiat currencies.

Multidimensional Poverty Index

In News: As many as 41.5 crore people excited poverty in India during the 15-year period between 2005-06 and 2019-21, out of which two-thirds exited in the first 10 years, and one-third in the next five years, according to the global Multidimensional Poverty Index (MPI).

- Improvement in MPI for India has significantly contributed to the decline in poverty in South Asia.

Dimensions of Poverty:

- **Absolute poverty** – income below a certain threshold necessary to meet basic necessities of life (food, shelter, clothing, rent)
- **Relative poverty** – Individuals receiving income a certain level (e.g. 50%) below the median income of the general population.
- **Persistent poverty** – This is defined as a household which is below the poverty threshold line for 2 out of the past 3 years.
- **Headcount Index** – It is a widely-used measure, which simply indicates the proportion of the poor to total population. It does not indicate how poor the poor are.
- **Poverty gap index** – It is the ratio by which the mean income of the poor falls below the poverty line.
- **The Sen index** – It is a composite poverty measure, which combines incidence and intensity of poverty risk with the distribution of income among those at risk of poverty.

Global Multidimensional Poverty Index:

- It is a report produced by the United Nations Development Programme (UNDP) and the Oxford Poverty and Human Development Initiative (OPHI)
- The global MPI constructs a deprivation profile of each household and person through 10 indicators spanning health, education and standard of living. All indicators are equally weighted within each dimension.

- The global MPI identifies people as multidimensionally poor if their deprivation score is 1/3 or higher.
- The MPI is calculated by multiplying the incidence of poverty and the average intensity of poverty.
- The MPI ranges from 0 to 1, and higher values imply higher poverty.
- By identifying who is poor, the nature of their poverty (their deprivation profile) and how poor they are (deprivation score), the global MPI complements the international $1.90 a day poverty rate, which was revised by the World Bank last month to $2.15 per day.
- India ranked 62 in the Global MPI 2020 which ranked 107 countries.

Findings of the report:

- The incidence of poverty fell from 55.1% in 2005/06 to 16.4% in 2019/21 in the country.
- Deprivations in all 10 MPI indicators saw significant reductions as a result of which the MPI value and incidence of poverty more than halved.
- Globally, of the total 610 crore people across 111 developing countries, 19.1% or 120 crore live in multidimensional poverty. Nearly half of them live in severe poverty.
- The report doesn't fully assess the effects of the COVID-19 pandemic on poverty in India as 71% of the data from the National Family Health Survey-5 (2019-2021) relied upon for MPI were collected before the pandemic.
- The report also notes that for India, the relative reduction from 2015/2016 to 2019/21 was faster: 11.9% a year compared with 8.1% from 2005/2006 to 2015/2016. This is unsurprising because relative poverty reduction is easier to achieve when starting levels of poverty are lower.
- Bihar, the poorest State in 2015/2016, saw the fastest reduction in MPI value in absolute terms. The incidence of poverty there fell from 77.4% in 2005/2006 to 52.4% in 2015/2016 to 34.7% in 2019/2021.
- Improvement in MPI for India has significantly contributed to the decline in poverty in South Asia.
- It is for the first time that India is not the region with the highest number of poor people, at 38.5 crore, compared with 57.9 crore in Sub-Saharan Africa.

Significance of MPI:

- Wide coverage across the length and breadth of the country and has international comparability.
- The MPI is, in principle, able to make statements about the extent of global multidimensional poverty in a way the World Bank's $1-a-day poverty line makes about global absolute income poverty.
- More reliable database than the one used for the income poverty measure, where the comparability of survey instruments across country and over time is much less certain.
- Since it is based on household survey information, it is much more actionable and a policy-relevant indicator for countries and agencies than the HDI.
- One can decompose the MPI by region, by particular groups, and by indicator, thereby allowing countries to directly see which groups suffer most and in which dimensions they are deprived.

Poverty Challenges in India:

- India has by far the largest number of poor people worldwide at 22.8 crore, followed by Nigeria at 9.6 crore.
- Two-thirds of these people live in a household in which at least one person is deprived of nutrition.
- There were also 9.7 crore poor children in India in 2019/2021- more than the total number of poor people, children and adults combined, in any other country covered by the global MPI.
- Of the 10 poorest States in 2015/2016, only one (West Bengal) was not among the 10 poorest in 2019/2021. The rest— Bihar, Jharkhand, Meghalaya, Madhya Pradesh, Uttar Pradesh, Assam, Odisha, Chhattisgarh and Rajasthan —remain among the 10 poorest.
- While poverty levels have not worsened, levels of under-nutrition are still very high. There is no marked acceleration in rate of improvement between NFHS-3 and NFHS-4 and NFHS-4 and NFHS-5. And the MPI mainly captures the pre-COVID situation because 71% of the NFHS-5 interviews were pre-COVID.

India's Multidimensional Poverty Index:

- Steered by the Government of India's Global Indices for Reforms and Growth (GIRG) initiative, the National Multidimensional Poverty Index (MPI) for India is aimed at leveraging the monitoring mechanism and methodology of the globally recognised MPI to rigorously benchmark national and subnational performance and drive programmatic actions and reforms.
- It is released by NITI Aayog
- Objectives:
  - Enhanced high-level view of poverty at the national level
  - Complements monetary poverty measures
  - Information to shape policy
  - Provides incentives for leaving no one behind and reaching the furthest behind first
  - To track poverty over time
  - To highlight "how" poor are the people in poverty
  - To show the percentage of people who are multidimensionally poor
  - To show the percentage of weighted deprivations the average multidimensionally poor person suffers from.

Way forward:

The ongoing task of ending poverty remains daunting.

The Sustainable Development Goal target 1.2 is for countries to reduce at least by half the proportion of men, women, and children of all ages living in poverty in all its dimensions by 2030.

New Foreign Trade Policy

In News: The Commerce Ministry has once again deferred the launch of its new foreign trade policy (FTP) as it felt the need to have wider consultation with industry.

- The current FTP (from 2015-20 but extended thereafter till March 2023) is a policy document that spells out the objectives and strategies to boost exports.

New foreign trade policy (FTP):

- The current trade policy was introduced in 2015 for a five-year term.
- During the COVID-19 pandemic, the government extended the Foreign Trade Policy 2015-20 for till 2022-23.
- The new policy will be a comprehensive and important document that interprets rules, regulations, and procedures in international trade transactions, which are critical in facilitating export-import operations and making the export sector more competitive.
- India's strategy is to cash in on a world seeking to become less dependent on China and to enable exporters (and importers) to plan their investments ahead.
- The new policy will aim to provide a leg-up to exports and address some of industry's key concerns, including a buffer against rising interest rates. It could include measures to help push up goods and services exports as well as rein in the runaway import bill.
- There is a need for new policy due to global growth slowdown and recession fears after the Ukraine-Russia war.
- The Indo-Pacific Economic Framework has led to assertions that the Government has 'no bandwidth' left for new free trade pact negotiations through more countries.

Significance:

- Enhance trade facilitation measures
- Provide a simpler duty exemption scheme
- Reintroduce a services export promotion scheme
- Increase India's share in global services exports
- Increase employment

- Boost domestic manufacturing
- Rope in India's economic clout across the globe
- Leverage India's potential in the services sector for greater export revenue

RoDTEP scheme & its issues:

- Remission of Duties and Taxes on Export Products (RoDTEP) scheme aims at neutralizing the taxes at the State and local levels not otherwise refunded under any other mechanism.
- RoDTEP is a refund of duties and taxes (electricity duties, petroleum taxes, stamp duty etc.) which are embedded in manufactured products for exports. These taxes and duties are also applicable on excluded sectors and therefore need to be refunded to all sectors.
- However, this does not include "cess and levies," which has emerged as a potent instrument in recent years, to collect funds for designated purposes.
- Not only this, the RoDTEP benefits are confined to limited sectors and a number of important sectors such as pharmaceuticals (chapter 30 of the FTP), chemicals (chapter 28 and 29) and steel (chapter 72 and 73) are out of its purview.
- Under the current policy, RoDTEP benefits are not available to advance authorisation holders and EOU's.
- Exemption granted under the advance authorization/EPCG scheme/EOU is primarily from customs duties and IGST and not from embedded taxes like electricity duty, diesel/petrol taxes etc.
- Suggestion: The RoDTEP benefits need to be extended to Advance Authorization holders and EOU's on priority basis.

Other challenges:

- **Pendencies:**
  - There is a long list of pending cases of redemption with respect to the Advance Authorization scheme due to pre-import conditions.
  - This needs to be sorted out immediately by withdrawing the pre-import condition retrospectively.
  - If this is not possible, examination of pre-import conditions should be limited to the actual violation based on actual import with respect to export and should not be based on the licensing period.

Suggestions:

- Government should consider the details of imports and against each authorisation on individual merits and help redeem such cases.
- To achieve the $1,000 billion exports target by 2030, it is important to resolve pending cases in a justified and time-bound manner.
- This will help exporters to focus on boosting exports rather than grappling with their existing cases.
- Manufacture and Other Operations in Customs Warehouse (MOOWR)
- Introduced in 2019 to facilitate duty free imports for exports under the Customs bonded warehouse.
- This scheme is akin to Export Oriented Units (EOU) of the FTP.
- Complicated methodology: Because the EOU scheme has dual monitoring, one by Development Commissioner and another by customs
- there are significant ambiguities on the scope of operations, depreciation provisions relating to capital goods etc., which need to be addressed for greater transparency
- Suggestions: it is better to bring about a simple methodology for conversion of existing units under EOU scheme into MOOWR scheme.
- Imports are subject to compliance with domestic laws as outlined in the FTP.
- It provides a generic guideline and actual regulations are multiple and not available at a single point.
- There is a need to provide greater clarity and explanation of laws, rules, orders, regulations and technical specifications stipulated in Para 2.03 of the existing FTP.

- Suggestions: A separate appendix in the Handbook of Procedures covering all compliances under various domestic laws is required.

Way forward:

- The new FTP focuses more on addressing operational issues of EXIM operations as they reduce not only the cost of doing operations but also improves firm level export competitiveness.
- To enable a mechanism for integrated tax neutralisation through a single window.
- Lowering down logistics costs to make products competitive.
- Digitisation and e-commerce must integrate government policies such as one district, one product and should complement each other.
- Free trade agreements between regional partners must be further explored for tapping trade opportunities with leading economies.

Minimum Support Prices

Context: Recently, the Cabinet Committee on Economic Affairs under the chairmanship of Prime Minister approved the increase in the Minimum Support Prices (MSP) for all mandated rabi crops for marketing season 2023-24.

Highlights of the meeting:

Increase in MSPs:

- Rs 110 per quintal (5.46 per cent) increase for the wheat crop.
- Other rabi crops — barley, gram, lentil (masur), rapeseed & mustard, and safflower — have increased in the range of 2.01 per cent to 9.09 per cent.

Maximum rise in MSP:

- In absolute terms, the highest increase in the MSP has been approved for lentils (masur) at Rs 500 per quintal.
- Followed by rapeseed and mustard (Rs 400 per quintal), safflower (Rs 209 per quintal), gram (Rs 105 per quintal), and barley (Rs 100 per quintal).

Increase in wheat MSP:

- The increase in the wheat MSP is higher in both absolute and percentage terms compared to last year.
- In absolute terms, a hike of Rs 110 per quintal in the MSP of wheat is the highest since 2017-18, when an equal hike was made — from Rs 1,625 to Rs 1,735.
- In line with Union Budget 2018-19:
- It was announced for fixing the MSP at a level of at least 1.5 times of the All-India weighted average cost of production, aiming at reasonably fair remuneration for the farmers.

Three kinds of Production cost:

- The CACP projects three kinds of production cost for every crop, both at state and all-India average levels.
- 'A2': Covers all paid-out costs directly incurred by the farmer in cash and kind on seeds, fertilisers, pesticides, hired labour, leased-in land, fuel, irrigation, etc.
- 'A2+FL': Includes A2 plus an imputed value of unpaid family labour.
- 'C2': It is a more comprehensive cost that factors in rentals and interest for owned land and fixed capital assets, on top of A2+FL.
- CACP considers both A2+FL and C2 costs while recommending MSP.

Significance of MSP:

- Better price for their crops: With the increase in the MSP, farmers will get a better price for their crops and procurement will also be done.
- Promotion to grow oilseeds: As farmers get a secured price for their crops, it will encourage more and more farmers to grow oilseeds as well as prompt them to shift away from grains.
- Crop Diversification: There are slightly higher increases in the MSP for pulses, oilseeds and coarse cereals which helps in achieving the motive of diversifying crops.
- Differential Remuneration and protection to farmers: It helps in diversifying the crops in land use pattern. It protects farmers from the unwarranted fluctuation in prices provoked by the international level price variations. Any sharp fall in the market price of a commodity can be handled as MSP acts as a shock absorber.
- Mend demand supply imbalance: Concerted efforts were made to realign the MSPs in favour of oilseeds, pulses and coarse cereals. It encouraged farmers to shift to larger areas under these crops and adopt best technologies and farm practices, to correct demand – supply imbalance.
- Focus on Nutri-Rich crops: The added focus on nutri-rich nutri-cereals is to incentivise its production in the areas where rice-wheat cannot be grown without long term adverse implications for groundwater table.
- Needs of consumers: MSP ensures that the country's agricultural output responds to the changing needs of its consumers. Ex: The government hiked the MSP of pulses to expand sowing of pulses.
- Food Crops: The MSP incentivises production of a specific food crop which is in short supply.
- Forward chain: The MSP leads to higher farm profits which encourage farmers to spend more on inputs, technology etc.
- Atma-Nirbhar Bharat: To boost pulses and oilseeds production and reduce the country's dependence on imports, the government increased the support price of tur by Rs 300 to Rs 6,300 per quintal for the 2021-22 crop year from Rs 6,000 per quintal last year.

Challenges associated with MSP:

- Protest by Farmers: Farm unions have been protesting for more than six months on Delhi's outskirts, demanding legislation to guarantee MSP for all farmers for all crops, and a repeal of three contentious farm reform laws.
- MSP and Inflation: When announcing the MSP, inflation should be considered. But often the price is not increased upto that mark. Example, this time MSP for Maize has not even considered inflation then how it will benefit farmers! Also, frequent increase in the MSPs can lead to inflation too.
- High Input costs: The input costs have been rising faster than sale prices, squeezing the meagre income of the small farmers and driving them into debt.
- Lack of Mechanism: There is no mechanism that guarantees that every farmer can get at least the MSP as the floor price in the market. So proper mechanisms need to be fixed for all times to come.
- Restriction in Exports: Even after producing surplus grains, every year a huge portion of these grains gets rotten. This is due to the restrictions under WTO Norms, that grain stocks with the FCI (being heavily subsidised due to MSP) cannot be exported.
- Limited Awareness: Farmers, especially small and marginalised ones, are less aware about the time of announcement of MSPs. It leads to them being left out of the whole virtuous cycle.
- Economically Unsustainable: The economic cost of procured rice and wheat is much higher for the FCI than the market price of the same. Due to this, the FCI's economic burden eventually will have to be borne by the Union government and may subsequently lead to divergence of funds from being invested in agriculture infrastructure.

Way Forward:

- Agriculture is, perhaps, the only business where there is a high probability of both production and price risks. It may be more worthwhile to consider "how best" to make MSP work for the farmer.
- Public procurement needs to continue for staple cereals, but farmers of non-staple food crops need to be provided with direct income transfers.

MUST READ: MSP

Risk to UPI being a Public Good

Context: Recently there has been a debate among various industry stakeholders and the government on making digital payments through UPI infrastructure chargeable.

- Although recently the finance minister has reiterated that the UPI was a digital public good and hence will likely remain a free-of-charge product.

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.

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.
- Touted 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.

Issues with the UPI infrastructure:

- UPI has neither reduced the cost of money or currency, nor has it propelled a mass-scale substitution of physical cash with UPI.
- The payments industry is unhappy with the current free-UPI model because the cost of its investments in infrastructure don't recover.
- Incremental investments are not coming in thus the upgradation of infrastructure has suffered.
- This is partly a reason for the high transaction failure rates of the UPI.
- Payment rejection rates are increasing from less than 1% about 4 years back to about 2% currently.
- Although the UPI allows transfer of up to ₹1 lakh but about 70% of the total payments are lower value transactions (up to ₹200).
- In reality it has replaced low-denomination rupee notes and not really cash as a payment mode

Government's stand o UPI:

- The government believes that the current reimbursement fund is adequate to find the stakeholders.
- Although the reimbursement fund neither considers the constant cost of upgrading the back-end systems of the payment providers nor does the money reach everybody in the ecosystem.
- While banks end up getting their costs refunded, payment apps and infrastructure providers are often left to fend for themselves.

Advantages of making UPI transactions chargeable

- Data trade and data mining accounts for a third of total revenues for payment apps.
- RBI and the government are trying to clamp down on companies making gains out of the consumer's personal data, introducing charges on UPI transfers could help address this.

- The NPCI has been facing the challenge of capping the market dominance of certain players in the payment interface.
- A mechanism to charge payments can help address this issue too.
- For instance, the NPCI could levy an additional user fee on payment companies which have breached the permissible transaction threshold.
- Such levies are usually passed on to customers, and this itself would help cap individual player market shares at 30 per cent.
- The payment infrastructure providers will get incentivized to upgrade their infrastructure thus making innovation in the field.
- Save government finances on subsidies as the government allocates substantial amounts for reimbursement of charges towards RuPay debit card and UPI transactions.

Way forward:

- UPI is a means to accelerate formalization and digitization of the economy and thus its infrastructure needs to be upgraded at the right times.
- To make the UPI acceptable and relevant across larger ticket sizes and economic strata, all the players in the UPI ecosystem need to be incentivized.
- Therefore, if the government's intention is to increase the use case and acceptability of UPI.
- It should do away with its policies of populism and should make the UPI infrastructure chargeable so that the UPI lives up to its expectation of "a new generation payment system" and which is accepted across the globe.

About Public Good:

- Public goods are non-excludable and non-rivalrous, meaning they are free for everyone and unlimited in supply.
- In theory , there is no shortage to others as they are non-rivals in consumption
- The public sector typically manages public goods and the private/free market does not produce them i.e., the state has absolute say over these goods.
- Public goods suffer from what economists call the free-rider problem.
- Examples of public goods include: Street lighting, National defense, public beaches, National parks and monuments, Education, healthcare infrastructure etc.

Are public goods necessarily available at zero cost?

- Public goods are actually not available at a zero cost because they come at a cost which is indirectly paid in the form of taxes.
- In specific cases such as healthcare or education the dynamics are different.
- While basic or entry level public goods are usually available free of cost, specialized healthcare treatment or higher education usually does come at a cost.
- When a public institution provides healthcare/education services, the costs are lesser than a private player which actually creates certain artificial usage barriers.
- For instance, free education or education at a low fee is an option only to households of a certain socio-economic strata.
  But in case of road and toll taxes everyone having a vehicle will be paying road tax i.e public goods are not completely free.

INTERNATIONAL RELATIONS

India-US relations

In News: The U.S. Congressional amendment to the National Defense Authorization Act states that India faces immediate and serious regional border threats from China, with continued military aggression by the Chinese people along the India-China border.

About India-US relations:

- The U.S.-India strategic partnership is founded on shared values including a commitment to democracy and upholding the rules-based international system.
- There are more than 50 bilateral dialogue mechanisms between the two governments.
- Despite COVID-19 pandemic, India-U.S. cooperation witnessed intense engagement under various bilateral dialogue mechanisms in a wide range of areas including defence, security, health, trade, economic, science & technology, energy and people-to-people ties.

Political relations:

- The 2+2 Ministerial Dialogue is the premier recurring dialogue mechanism between the countries. U.S. hosted the fourth 2+2 Dialogue in 2022.
- The United States welcomed India joining the UN Security Council in 2021 for a two-year term and supports a reformed UN Security Council that includes India as a permanent member.
- India and the US jointly proposed to list Makki, a top LeT (Lashkar-e-Taiba) Militant, under the UN Security Council's Al-Qaeda and ISIL (Islamic State of Iraq and the Levant) Sanctions Committee which is also known as the UNSC 1267 Committee.
- Quad is a strategic security dialogue between Australia, India, Japan, and the United States and is viewed as a response to increased Chinese economic and military power.
- There have been regular parliamentary exchanges and high-level visits to strengthen ties of friendship and cooperation – External Affairs Minister's visit in September 2022, PM Modi's visit in 2021 and Donald Trump's visit to India in 2020.

Defence relations:

- India-US defence cooperation is based on "New Framework for India-US Defence Cooperation", which was renewed for a period of ten years in 2015.
- A strong United States-India defence partnership is rooted in shared democratic values and is critical to advancing United States interests in the Indo-Pacific region.
- Defence procurements from the US have been an area of steady growth in the last decade. India has procured defence items of around US$ 21 billion from the US since 2008.
- India-specific waiver under CAATSA – will allow India to freely purchase Russia's S-400 missile system without the fear of American sanctions.
- Defence agreements include The Basic Exchange and Cooperation Agreement, or BECA (2020) on sharing sensitive satellite data and allowing US's strategic partners to access a range of sensitive geospatial and aeronautical data which is useful for military actions. Other agreements include Logistics Exchange Memorandum of Association (LEMOA 2016) and COMCASA.
- Both countries set up a Counter-Narcotics Working Group which met for the first time virtually on 24 November 2020.
- India-US Cyber Framework signed in 2016, provides for expanding cooperation in the cyber domain.
- India-US military exercises include Yudh Abhyas, Vajra Prahar, Cope India, MALABAR, Red Flag and RIMPAC.

Economic relations:

- The U.S. is India's largest trading partner and most important export market.
- In 2021, overall U.S.-India bilateral trade in goods and services reached a record $157 billion. Major export items from India include petroleum, polished diamonds, pharmaceutical products, jewellery, frozen shrimp, whereas major imports from the US include petroleum, rough diamonds, liquified natural gas, gold, coal, waste and scrap, almonds and so on.
- In 2021-22, India had a trade surplus of $32.8 billion with the US.
- During the financial year 2020-21, India received the highest ever FDI amounting to $81.72 billion, as per Ministry of Commerce and Industry.
- The US is one of the top 5 investment destinations for Indian FDI. At 2020, Indian investment in the United States totalled $12.7 billion, supporting over 70,000 American jobs.

Bilateral dialogues:

- India is one of twelve countries partnering with the United States on the Indo-Pacific Economic Framework for Prosperity (IPEF) to make our economies more connected, resilient, clean, and fair.
- India-U.S. Trade Policy Forum: Established in 2005, it serves as the leading bilateral mechanism. The 11th Meeting was held in 2017.
- India-U.S. Commercial Dialogue: focuses on cooperation in areas such as standards, ease of doing business, travel & tourism. The meeting is chaired by the Minister of Commerce & Industry and the U.S. Secretary of Commerce.

Indian Diaspora:

- About 4.2 million Indian Americans/Indian origin people reside in the US. The Indian Americans constitute the third largest Asian ethnic group in the US.
- There are a number of Indian American community organizations as well as several professional organizations of Indian Americans.
- Indian Americans are one of the most successful immigrant communities in the US and are excelling in diverse fields, including politics.
- The Indian diaspora has been a catalyst in cementing closer ties between India and the U.S.
- The nearly 200,000 Indian students in the United States contribute $7.7 billion annually to the U.S. economy.
- The U.S. accounts for 23% of total remittances in 2020-21.

Science & Environment:

- In 2021, U.S. joined the International Solar Alliance headquartered in India, and in 2022 the United States Agency for International Development (USAID) Administrator became Co-chair of the Governing Council of the Coalition for Disaster Resilient Infrastructure (CDRI) where India is a permanent co-chair.
- Initiative on Critical and Emerging Technologies is a collaboration between engineers, computer scientists, governments, academia, and industry. It is vital to address the latest advances in artificial intelligence, quantum computing, biotechnology, aerospace, and semiconductor manufacturing and to help foster innovation and facilitate technological advances that continue to far outpace the technology of Russia and China.
- At the Leaders' Summit on Climate held in 2021, "U.S.- India Climate and Clean Energy Agenda 2030 Partnership," was launched which envisages bilateral cooperation on strong actions in the current decade to meet the goals of the Paris Agreement.

Challenges:

- US-Pakistan friendship: US decided to provide a $450-million sustenance package for Pakistan's aging F-16 fleet.
- US sanctions: targeted an India-based petrochemical company for selling Iranian petroleum products to China.
- Russia-Ukraine conflict: Due to India's neutral stance, the US reiterated India's position as "unsatisfactory" but "unsurprising" due to its historical relationship with Russia

- Concern of China: China has been opposing the U.S.' proactive policy specifically in the disputed South China Sea and thus reducing India's chances of forming a favourable partner in the area.

Way forward:

- Such a partnership between the world's oldest and largest democracies is critical and should continue to be strengthened in response to increasing threats in the Indo-Pacific region so as to send an unequivocal signal that sovereignty and international law must be respected.
- Prime Minister Narendra Modi recently told President Vladimir Putin that "today's era is not of war" on account of Russia-Ukraine conflict and the US was pleased with the formulation and its articulation in full public glare.

India-United Kingdom Relations

Context: India's External Affairs Minister recently discussed relations between India-U.K. with his British counterpart of UK. The call took place just before he was confirmed to continue in the post of Foreign Secretary by the newly appointed British Prime Minister Rishi Sunak.

- The two Ministers discussed several issues but the announcement of the phone call did not include the state of negotiation of the India-U.K. Free Trade Agreement (FTA) that missed the Deepavali deadline that was given earlier this year by Prime Minister Boris Johnson during his visit to India.

History of India-United Kingdom relations

1600-1857: East India Company

- 1600: Trade was first established between Mughal India and Tudor England. Elizabeth, I granted a royal charter to the East India company.
- 1757: The Battle of Plassey started the advent of company rule in India. Over the years a series of wars and treaties expanded the company's influence all over India.
- Through the Anglo-Mysore wars, Anglo-Maratha wars, and Anglo-Sikh wars- EIC controlled most of the Indian subcontinent.
- 1857: Indian rebellion of 1857 led to the end of company rule in India. The rule was transferred to the crown and the British government.

1858-1947: British Raj

- 1858: The British Government seized control of the territories and treaty arrangements of the former East India Company.
- Over the next span of years, the British fought numerous wars including the Anglo-Afghan Wars, the Anglo-Gurkha Wars, the Anglo-Burmese Wars, the First and Second Opium Wars, and World War I and II on the strength of the British Indian Army.

Indian Independence Movement:

- The 1857 rebellion became the inspiration for initiating the struggle for independence in India.
- Many nationalists and revolutionaries and leaders stood up against British rule like Tilak, Lala Lajpat Rai, Bhagat Singh, Netaji Subhash Chandra Bose, Mahatma Gandhi, Nehru, and many more.
- The events of the freedom movement eventually led to the dissolution of the British Raj and the Independence of India on 15 August 1947.
- However, it also resulted in the Partition of India into two new entities, the Dominion of Pakistan (which included the province of East Bengal that would later achieve independence as Bangladesh) and the Dominion of India.
- 1950: India decided to be in the commonwealth of nations after becoming a republic.
- Both Britain and India have since pursued quite divergent diplomatic paths.

- In particular, India became a major force within the Non-Aligned Movement, which initially sought to avoid taking sides during the Cold War. This contrasted with Britain's position as a founding member of NATO and a key ally of the United States.

Economic and Trade relations:

- India is the 2nd largest investor in the UK. While the UK ranks 18th as a trading partner of India, it is 3rd as an investor in India.
- 2005: The Joint Economic and Trade Committee (JETCO) was inaugurated in New Delhi aimed at boosting two-way bilateral investments.
- India's main exports to the UK are: ready-made garments and textiles, gems and jewellery, engineering goods, petroleum and petrochemical products, transport equipment and parts, spices, manufactures of metals, machinery and instruments, drugs & pharmaceuticals and marine products.
- The main imports from the UK to India are: precious and semi-precious stones, metalliferous, ores and metal scraps, engineering goods, professional instruments other than electronics, non-ferrous metals, chemicals, and machinery.
- In the services sector, the UK is the largest market in Europe for Indian IT services.
- The top sectors attracting FDI from the UK are petroleum, ports, services, roads and highways, and computer software.
- The growth of India's multinational companies contributed greatly to the UK's business and economy.
- India-UK bilateral merchandise trade (Trade in Goods and Trade in Service) has increased exponentially over the decade.
- Under the Road map, a free trade agreement was signed in 2021.

Cultural relations:

- India and UK signed a Memorandum of Understanding on Cultural Cooperation in July 2010. The Nehru Centre (TNC), established in 1992 in London, is the cultural outreach of the High Commission of India in the UK.

Nuclear Cooperation:

- Both nations have signed a Civil Nuclear Cooperation Declaration in 2010 to help promote and facilitate cooperation in the nuclear field including nuclear trade and also between the scientific institutions of the two countries
- In 2015, the UK and Indian Prime Ministers signed a Nuclear Collaboration Agreement as part of a comprehensive package of collaboration on energy and climate change, including joint research programs and initiatives to share technical, scientific, financial, and policy expertise.

Education:

- India is the second-largest source of students studying in the UK and the number of Indian students in the UK is approximately 38,000. The UK-India Education and Research Initiative (UKIERI) was launched in 2005 with a focus on higher education and research, schools, and professional and technical skills.
- 2016 was announced as the UK-India year of Education, Research and Innovation.

Defence cooperation:

- At all the three service levels, joint exercises and wide-ranging exchanges between the three services are conducted regularly.
- Prime Ministers Modi and Johnson have set out a shared vision for the UK-India defence partnership and agreed to advance the relationship to a new level.
- India-UK agreed to significant new cooperation on Maritime Domain Awareness, which includes new agreements on maritime information sharing, an invitation to the UK to join India's Information Fusion Centre in Gurgaon, and an ambitious exercise program that includes joint trilateral exercises.

Health:

- As a Global Force for Good in health, the UK and India will use our combined research and innovation strength to address the biggest global health challenges, save lives and improve health and well-being.
- The India-United Kingdom Health Partnership envisions to enhance global health security and pandemic resilience, show leadership in Antimicrobial Resistance (AMR), promote healthy societies and strengthen both our health systems through increased collaboration on clinical education, health worker mobility, and digital health.

Way Forward:

- The UK values its relationship with India just more than trade and India regards the UK as an important player in world politics and development. There is a convergence of views on global issues. Both believe in rule based international order. UK is the permanent member of the UNSC and supports India for its permanent membership. Both support the development in west Asia.
- There are areas in which the UK seeks India's support, opinion and shares their views with us. At a time when the UK is not part of Europe, it is very important to have strong friends outside and India is one of those.
- As the UK prepares to leave the EU, it is time to reset this relationship. Both the countries cannot afford to be complacent or rely on historical connections to deliver a modern partnership.
- Britain could further its relationship with India including through security and defence cooperation, joint exercises of the armed forces, and working with India to achieve reform at international bodies such as the UN and WTO. Trade, security, a shared commitment to the rules-based international system — these are all factors in our growing and evolving partnership.
- India is one of the fastest growing large economies of the world and FTA with the UK has played a significant role in enhancing the trade volume of the country.

HISTORY AND ART & CULTURE

Neo-Buddhism

In News: Every year in October, thousands of people assemble at Nagpur's Deekshabhoomi to pay homage to B.R. Ambedkar converted to Buddhism and remembered the historic day of October 14, 1956, when he and half a million of his followers embraced Buddhism.

- Some 5,000 Tamils of Myanmar accepted Buddhism in Rangoon under the leadership of Chan Htoon, the Justice of the Supreme Court of the Union of Burma in 1956.
- Dr B R Ambedkar found Buddhism spiritually satisfying as it preached love and compassion for all (karuna).
- Moreover, it was in affirmation with principles of liberty, equality and fraternity that guided him throughout his life.
- He found that Buddhism is rooted in India's civilization, supplements modern ethical values and is averse to social hierarchies and patriarchal domination.

What is Neo-Buddhism:

- The Neo Buddhist movement (also known as the Buddhist movement For Dalits, Ambedkarite Buddhist movement or Modern Buddhist movement) is a religious as well as a socio-political movement among Dalits in India which was started by B. R. Ambedkar.
- Aim: It was proposed as a mass movement that would elevate former 'Untouchables' and help them achieve self-respect. It was hoped that Buddhist principles would mobilize them into a robust community to battle the ruling Brahmanical elites.
- Theoretically, the neo-Buddhist movement is seen as an ideological and intellectual challenge to the dominant social and political ideas of the ruling elites.

Difference between Buddhism & Neo-Buddhism:

- It does not accept in totality the scriptures of the Theravada, the Mahayana, or the Vajrayana. Rather, propagates a fourth yana, a Navayana – a kind of modernistic Enlightenment version of the Dhamma.
- Ambedkar and his idea of Buddhism defy many of the core doctrines of Buddhism. He saw many integral aspects of Buddhist practice as fraudulent and pessimistic. He was particularly against Buddha's parivaja.
- According to Ambedkar, the Four Noble Truths are a "gospel of pessimism", and may have been added into the scriptures by Buddhist monks of a later era.
- He considered the idea of Anatta (doctrine stating that human beings are soulless) problematic and asked his followers to disregard it.
- Nirvana, according to Ambedkar, is not some other-worldly state of perfect life, highest happiness and salvation or liberation from the cycle of birth and rebirth. In Ambedkar's view, nirvana is the socio-political "kingdom of righteousness on Earth" in which people are freed from poverty and social discrimination and empowered to create themselves happy lives.

Role of Neo-Buddhism:

- Neo-Buddhism emerged as a maverick phenomenon that offered strong psychological solace to the struggling Dalit masses.
- It came about to be crucial in building a challenge to the dominant narrative of Hindutva.

- It is the creative application of the neo-Buddhist identity and ideology that has structured the Dalit movement as an autonomous political force in Maharashtra. Deeksha Bhoomi in Nagpur, the place where Ambedkar embraced Buddhism, has emerged as a monumental heritage site, attracting millions of visitors every year.
- Here, Buddhism was resurrected not only as a part of India's cultural and civilisational heritage but also as a tool to escape the caste hierarchical cultural hegemony and social hostility.
- The urban Buddhists marked by educational achievements – have offered vital leadership to Dalit politics
- Conversion to Buddhism also helped Dalits to find a robust meaning about their cultural past. They reinvented the Buddhist cultural symbols, rituals and practices as the proud markers of their new social identity.

Struggles of Neo-Buddhism:

- Buddhist cultural assertions and claims over public spaces became the symbols of their rejection against Hindu cultural hegemony and its social tentacles. Such assertiveness often put them in opposition with right-wing ideologies.
- Today, the Buddhist population in India is one of the smallest minorities. Its ideological challenge against the Hindu social order has not been taken seriously, and even within the Dalit community, conversion to Buddhism is not perceived as a suitable path to achieve social emancipation.
- A large majority (close to 80%) of Indian Buddhists resides in Maharashtra. However, it is mainly the Mahar caste, Matang and the Maratha castes which have identified themselves as neo-Buddhists. Other socially marginalised groups are still defined by Hindu caste nomenclatures and traditional occupations.
- The Dalit socio-political movements in States including Uttar Pradesh, Bihar, Tamil Nadu and Karnataka have also not promoted conversion to Buddhism and there is hesitation in suggesting religious conversion as an alternative to fight the battle for social justice.
- Even in States where the Scheduled Caste population is relatively high, such as in Punjab, West Bengal and Odisha, Dalits have shown restraint in adopting Buddhism to challenge their social location.
- India's neighbouring Buddhist countries also have not identified neo-Buddhists as significant partners in their theological engagements.
- Several Buddhist countries have built their own pagodas and temples in Bodh Gaya and are more concerned with adding new sites in India's Buddhist Circuit.
- Certain individuals and Buddhist associations from Japan, Thailand and the U.K. have established some close links with the neo-Buddhists of Maharashtra, but this is small support.
- The current Opposition lacks effective cultural strategies to challenge right-wing assertion. Instead, it still uses the same old formal electoral strategies.

Current government's actions:

- The Centre has presented itself as the promoter of Buddhist cultural heritage at the national and international levels.
- In overseas diplomatic gatherings, the Prime Minister of India has frequently invoked India's ancient Buddhist identity and shared Buddhist heritage with countries, especially China, Nepal, Myanmar and Japan.
- He also visited Deekshabhoomi in 2017, paid rich tributes to Ambedkar and announced multiple developmental projects.
- The Prime Minister inaugurated Kushinagar International Airport in Uttar Pradesh, which will help connect important Buddhist pilgrimage sites. Kushinagar is an important Buddhist pilgrim destination.
- It was his government that proposed a Buddhist Circuit.

Way forward:

Revisiting the ideals of Ambedkar's neo-Buddhist movement can be helpful in building fierce ideological challenges to Hindutva's understanding of history and culture.

MUST READ: Buddhist Philosophy

Kushans and Coins in India

Context: Recently coinage with images of gods and goddesses dating back to the Kushans has been found.

About Kushan Empire:

- Origin: The Kushans were one of five branches of the Yuezhi confederation, an Indo-European nomadic people.
- Yuezhis are people that ruled over most of the northern Indian subcontinent, Afghanistan, and parts of Central Asia during the first three centuries.
- In India: The Yuezhi nomads later transformed themselves into a ruling elite in a large area from Afghanistan to the Indus Valley and North Indian Plain.
- Role of Kanishka: Kanishka is considered to be the greatest king of the Kushan dynasty that ruled over the northern part of the Indian subcontinent, Afghanistan, and possibly areas of Central Asia north of the Kashmir region.
- He is, however, chiefly remembered as a great patron of Buddhism.

Great Eurasian power:

- It was during his reign, the kingdom was acknowledged as one of the four great Eurasian powers of its time (the others being China, Rome, and Parthia).

Shaka Era:

- The year 78 marks the beginning of the Shaka era, a system of dating that Kanishka might have initiated.

Satrapy system in India:

- Kushanas adapted the Persian satrapy administrative system into Indian kshatrapa administration.
- The Kushan regime gave much autonomy to local institutions such as castes, guilds, and Buddhist monasteries and meanwhile won support from those local communities.

Trade with Rome:

- The Kushans became affluent through trade, particularly with Rome, as their large issues of gold coins show.
- The Kushan Empire benefited from the Silk Road trade economically and meanwhile received the knowledge of faraway countries and facilitated transferring the information to the visions of the Romans, Parthians, and Chinese.

Buddhism and art schools in India:

- The Kushans were instrumental in spreading Buddhism in Central Asia and China and in developing Mahayana Buddhism and the Gandhara and Mathura schools of art.

Legacy:

- Unfortunately, very little evidence of the Kushan rule survives today.

In this, Kushan coins are perhaps the best evidence we may have of this illustrious dynasty.

About the Kushana Coins

Kadaphises:

- It was the Kushan emperor, Vima Kadaphises who introduced the first gold coins of India.
- The Double Dinar can be considered as the first gold coin of the Indian subcontinent.
- He introduced gold and copper coins, a large number of them have survived till today.

Kanishka:

- Kanishka minted coinage in two metals, gold and copper.

- Gold coins were minted in two denominations; Dinar (or stater) and quarter Dinars.
- Undoubtedly, Kushana coins were influenced by their predecessors Indo-Greeks, who were overthrown by Kushanas.

Images on the Kushana Coins:

Gods:

- The coins exhibit the figures of Greek, Roman, Iranian, Hindu, and Buddhist deities.
- According to historians, Kushanas were the first to use the image of Goddess Lakshmi on their coins, along with Ardochsho, the Iranic Goddess of wealth.
- They also depicted Oesho (Shiva), moon deity Miro and Buddha in their coinage.

Kings:

- Kushan coins tell a great deal about the images of the kings as they wished to be seen by their subjects.
- The portraits on Kushana gold/copper coins of Vima Kadphises are amazingly individualistic, often showing him as a full-bearded, big-nosed, fierce looking warrior chieftain, perhaps with deformed skull, wearing.
- high helmet, tunic, overcoat and felt boots.

About Coins in India:

- The beginning: The Coinage of India began anywhere between early 1st millennium BCE to the 6th century BCE, and consisted mainly of copper and silver coins in its initial stage.
- The coins of this period were Karshapanas or Pana.

Satavahana:

- The dates of their coming into power are contentious and are variously put between 270 BC to 30 BC.
- Their coins were predominantly of copper and lead; however, silver issues are also known.
- These coins carried the motifs of fauna like elephants, lions, bulls, horses, etc. often juxtaposed against motifs from nature like hills, trees, etc.
- The silver coins of the Satavahanas carried portraits and bilingual legends, which were inspired by the Kshatrapa types.

Western Kshatrapa:

- The legends on the coins were generally in Greek and Brahmi, Kharoshti too was used.
- The Western Kshatrapa coins are reckoned to be the earliest coins bearing dates.
- The common copper coins are the 'bull and hill' and the 'elephant and hill' types.

South Indian Coinage:

Cheras:

Cholas:

India has a long tradition of coinage with images of gods and goddesses

Dynasties with gods on their coins in India:

Gupta Coins:

King as Horseman

King as Lion Slayer

- The Gupta Empire produced large numbers of gold coins depicting the Gupta kings performing various rituals.
- The splendid gold coinage of the Guptas, with its many types and infinite varieties and its inscriptions in Sanskrit, are the finest examples of the coinage that we possess.

Vijayanagara Kings:

- Vijayanagara kings used coinage with Hindu idols. Harihara –II (1377-1404) introduced coins that had Brahma-Saraswati, Vishnu-Lakshmi and Shiva-Parvati.
- The Vijayanagara coins continued in circulation even after the kingdom was snuffed out in 1565 and commanded a premium when French traveller Tavernier visited the region.

The British East India Co.:

- The British East India Co. at Madras Presidency minted coins labelled as the Three Swamy Pagoda, which depicts Lord Balaji flanked by Sridevi and Bhudevi on either side.
- Not all the coins were freshly minted. Some were repurposed. Some were issued to show continuity.

Other Coins:

- Ancient India had considerable trade links with the Middle East, Europe (Greece and Rome) as well as China. This trade was carried out over land partly along what came to be alluded to as the silk route and partly through maritime trade.
- In South India, which had a thriving maritime trade, Roman coins even circulated in their original form, albeit slashed at times as a gesture disclaiming intrusions of foreign sovereignty.

Lothal, 'oldest dock in the world', to get Heritage Complex

Context: Recently, the Prime Minister reviewed the construction of the National Maritime Heritage Complex (NMHC) site at Gujarat's Lothal via video conferencing.

Indus Valley Civilisation -Mature Phase- (c. 2600-1900 BCE)

National Maritime Heritage Complex:

- **Genesis and Cost**: The project began in March 2022 and is being developed at a cost of Rs 3,500 crore.
- **Innovative features:**
o Lothal mini-recreation-which will recreate Harappan architecture and lifestyle through immersive technology
o Four theme parks – Memorial theme park, Maritime and Navy theme park, Climate theme park, and Adventure and Amusement theme park.
o The world's tallest lighthouse museum will be housed by the complex.
o India's maritime heritage from the Harappan time till today, will be highlighted by the 14 galleries.
o A coastal states pavilion will display the diverse maritime heritage of Indian states and UTs.

About Lothal:

- The port city is believed to have been built in 2,200 BC.
- It was located in the Bhil region of what is now the state of Gujarat.
- Lothal was a major trading centre of the Indus Valley Civilisation (IVC).
- It was a symbol of India's maritime power and prosperity, as its trade of beads, gems and ornaments reached West Asia and Africa.
- The meaning of Lothal (a combination of Loth and (s) thal) in Gujarati is "the mound of the dead".
- Incidentally, the name of the city of Mohenjo-daro (also part of the Indus Valley Civilisation, now in Pakistan) means the same in Sindhi.

Discovery of Lothal:

- The search for cities of the Harappan Civilisation was started by the Indian archaeologists post-1947 in Gujarat's Saurashtra.
- A team led by Archaeologist SR Rao discovered a number of Harappan sites including the port city of Lothal.
- Excavation work was carried out in Lothal between February 1955 and May 1960.
- The Archaeological Survey of India (ASI) reports that Lothal had the world's earliest known dock connecting the city to an ancient course of the Sabarmati River.
- The National Institute of Oceanography in Goa discovered marine microfossils along with the salt, gypsum crystals at the Lothal site.
- It indicates that sea water once filled the structure and it was definitely a dockyard.
- In later excavations, ASI unearthed a mound, a township, a marketplace, and the dock.
- The archaeological site museum stands adjacent to the excavated areas. It displays some of the most prominent collections of Indus-era antiquities in India.

Additional excavation findings about Lothal:

- Division of the Lothal city into citadel (upper town) and lower town shows existence of social/class differentiation in Harappan society.
- Planned urbanization: Paved baths, civic amenities, drainage and water facilities, well planned streets etc.
- Seals: Lothal holds the third largest collection of seals and sealings, engraved on steatite, with animal and human figurines and undeciphered letters from the Indus script.
- These seals give ideas of material and cultural values, worship of fire and sea goddess etc.

- Variety of burial methods.
- Beads: Lothal was famous for micro-beads that were made by rolling ground steatite paste on string, baking it solid and cutting with a tiny saw into the desired lengths.
- Weights and Tools: Harappan culture represented a standardized and precise system of weights and measures, which is reflected in the local materials at Lothal.
- For example, beautiful designs of human and animal figurines.
- Pottery and earthenware:

Significance of Lothal:

- Lothal was nominated as a UNESCO World Heritage Site in April 2014 but its application is pending on the tentative list of UNESCO.
- The excavated site of Lothal is the only port-town of the Indus Valley Civilisation.

- Town Planning: Lothal was a metropolis with an upper and a lower town and on its northern side a basin with vertical wall, inlet and outlet channels which has been identified as a tidal dockyard.
- Satellite images show the river channel (now dried), would have brought in considerable volume of water during high tide, which would have filled the basin and facilitated sailing of boats upstream.
- Port Functioning: The remains of stone anchors, marine shells, sealings which trace its source in the Persian Gulf; together with the structure identified as a warehouse further aids the comprehension of the functioning of the port.
- Heritage value of the Lothal is comparable to other ancient port-towns around the world like- Xel Ha (Peru), Ostia (Port of Rome) and Carthage (Port of Tunis) in Italy, Hepu in China, Canopus in Egypt, Gabel (Byblos of the Phoenicians), Jaffa in Israel, Ur in Mesopotamia, Hoi An in Vietnam etc.
- Regional Comparison: In the region, it can be compared with other Indus port towns of Balakot (Pakistan), Khirasa (in Gujarat's Kutch) and Kuntasi (in Rajkot).

Way Forward:

- The National Maritime Heritage Complex (NMHC) at Lothal will act as a centre for learning and understanding India's maritime history.
- The NMHC is being developed with the aim of displaying India's diverse maritime heritage.
- It will also help Lothal emerge as a world-class international tourist destination.

GEOGRAPHY

Ocean Currents

Context: According to a recent study, cold ocean currents have sheltered the Galápagos Islands from global warming.

- Ocean currents are the continuous, predictable, directional movement of seawater driven by gravity, wind (Coriolis Effect), and water density. Ocean water moves in two directions: horizontally and vertically.
- Horizontal movements are referred to as currents, while vertical changes are called upwellings or down welling.
- This abiotic system is responsible for the transfer of heat, variations in biodiversity, and Earth's climate system.

Overcoming Global Warming:

- The islands are protected from an otherwise warming Pacific Ocean by a cold, eastward equatorial ocean current and this current has been gaining strength for decades.
- The temperatures in waters along the west coast of the Galápagos have dropped by 0.5 degrees Celsius since the early 1990s.
- There's a tug of war between global warming and the cold ocean current. Right now, the ocean current is winning — it's getting cooler year after year.

Importance of Phenomenon:

- This phenomenon is a cause for cautious optimism for the Galápagos Islands.
- Flora and fauna of the Galápagos could assist reseed failing ecosystems and maintain the region's fisheries.
- Corals do not bleach and die in these waters off the west coast of Ecuador. So, the marine food chain does not suffer, unlike in the warm waters nearby.
- As the Galápagos so far has been relatively unaffected by climate change, it's worth looking at the Galápagos as a potential site to really try to put some climate change mitigation efforts into.
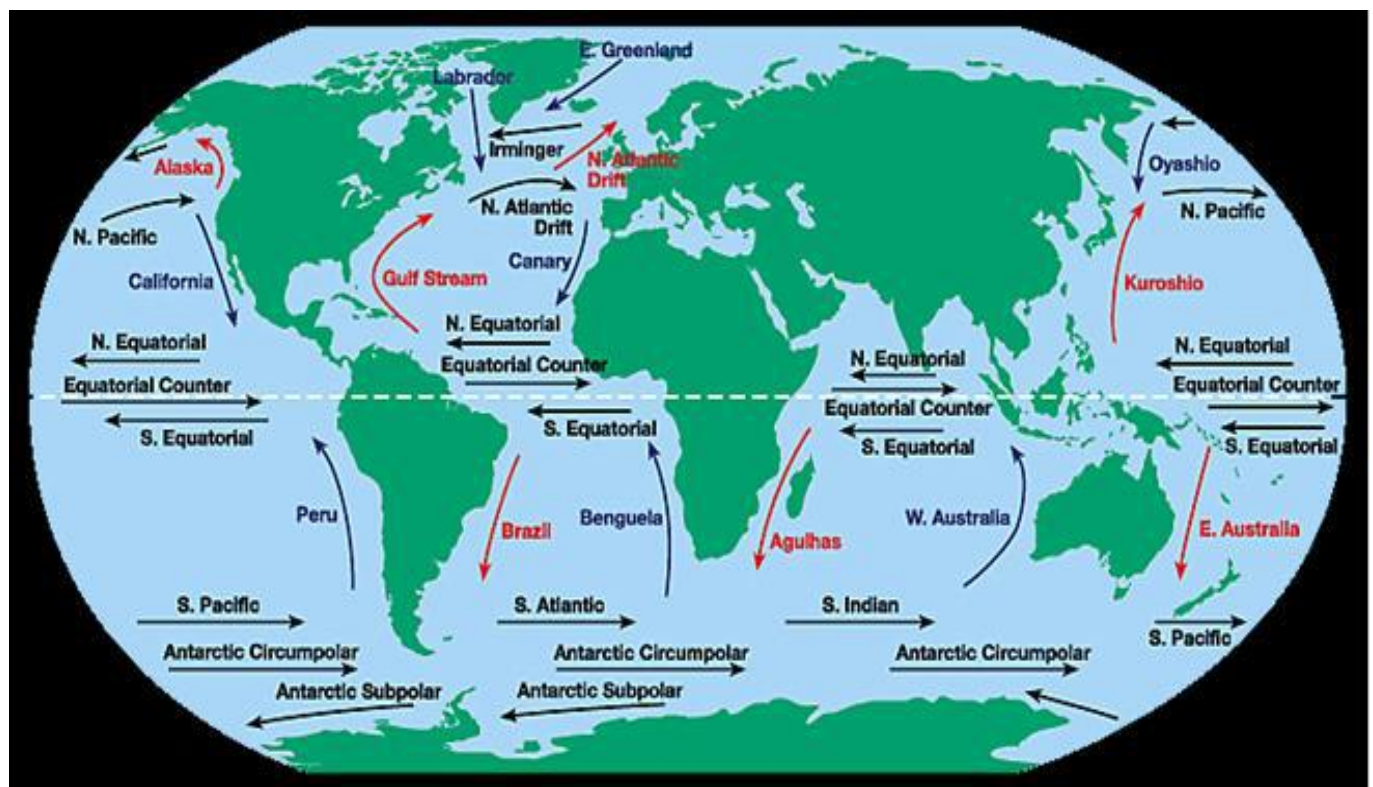
Significance of Ocean Current:

- Nutrient-rich Water: The equatorial undercurrent in the Pacific Ocean is bound to the equator by the force of the planet's rotation.
- Under the ocean's surface, a swift circulation of cold, nutrient-rich water flows from west to east.
- Some of this water is forced to the surface when it reaches the Galápagos Islands.
- The nutrient-rich water triggers photosynthesis and leads to an explosion of food for a wide variety of animals.
- Stability for Coral Reefs: The cold ocean current creates a cooler, more stable environment for coral reefs and marine life and birds that often live much closer to the poles.
- Position from Equator: From space, the Galápagos may appear to be a collection of minuscule specks in the eastern Pacific Ocean. However, it is their precise position on the equator that makes them significant.

Impact of Climate Change on Ocean Currents:

- Influx of Warm Freshwater: Climate change leading to increases in ocean temperatures, evaporation of seawater, and glacial and sea ice melting could create an influx of warm freshwater onto the ocean surface.
- Blocking Ice Formation: This would further block the formation of sea ice and disrupt the sinking of denser cold, salty water.
- Excess Heat in Atmosphere: The shallow, speedy currents could ultimately limit how much heat the ocean can absorb, causing more of that excess heat to remain in the atmosphere.
- Altering Global Temperatures: These events could slow or even stop the ocean conveyor belt, which would result in global climate changes that could include drastic decreases in Europe's temperatures due to a disruption of the Gulf Stream.
- Affecting Marine Biodiversity: Marine microbes and wildlife could be subjected to shallower, hotter, and faster surface waters.

Challenges arising out of Ocean Currents:

- Future of Current: The worry is if in the future there are changes in this current, it could be really devastating for the ecosystem.
- Regulation of Overfishing: The island group is certainly in need of greater protection from overfishing as well as the pressures of growing eco-tourism.
- Human Pressures: The human pressures on this area and the mechanism that keeps it alive are at odds. It's a major resource that should be protected.
- Adverse Impact of El Niño: El Niño poses a threat to the island group. It shuts down the cold current every couple of years, causing penguin populations to collapse. El Niño is a climate pattern that causes unusual warming of surface waters in the eastern tropical Pacific Ocean.

Way Forward:

- Ocean currents can regulate global climate, helping to counteract the uneven distribution of solar radiation reaching Earth's surface.
- Without currents in the ocean, regional temperatures would be more extreme — super hot at the equator and frigid toward the poles — and much less of Earth's land would be habitable.

About Galápagos Islands:

- An archipelago of volcanic islands.
- They are distributed on each side of the equator in the Pacific Ocean.
- The second-largest marine reserve in the world and contributed to the inception of Darwin's theory of evolution.
- They were designated as a UNESCO World Heritage Site and described as a "living museum and showcase of evolution."
- The island is a biodiverse ecosystem — home to several endangered species.

- Galápagos is home to the critically endangered — Galápagos penguin, Galápagos fur seal and Galápagos sea lion.

ENVIRONMENT

Carbon pricing mechanism

Context: 2021 Conference of Parties 26 (COP26) propelled nations to ramp up their climate targets and the concomitant Nationally Determined Contributions (NDCs) to reduce global greenhouse gas emissions(GHGEs).

- However, the updated NDCs and the announced pledges for 2030 remain insufficient and poorly aligned with the targets of the Paris Agreement.
- Actual reduction is estimated to be 7.5%, while the target required is 30% (to limit warming to 2°C) and 55% (to limit global warming within the 1.5°C).

Challenges to mitigating climate change:

- Climate change is a product of both market and policy failure such as fossil fuel subsidies and a distortionary tax system.
- The cost of emitting GHGs is not reflected in the price of goods and services.
- Poor incentives for potential innovators and the inadequacy of public infrastructure, energy networks, and finance have impeded investments in research, development and deployment of clean technology.

Carbon Pricing:

- The idea dates back to 1920 to Arthur Pigou in his book 'The Economics of Welfare'. A Pigouvian tax on carbon ensures that the cost of emitting GHGs is reflected in the price of the commodity or service.
- It embodies a laissez faire ideology offering a market-friendly mechanism that allows firms and consumers the flexibility to choose between the costs of cutting emissions and the benefits accrued from continuing to emit.
- Carbon pricing is considered a cost-effective measure to internalise the externalities associated with CO2 emissions and maximise emission reduction per dollar at the lowest possible cost.

Approaches to carbon tax pricing:

- Abatement approach— It is the marginal cost of reducing each additional unit of emission and is contingent on various factors including the pace of low carbon technological innovation, cost of compliance, as well as the ability of firms and consumers to substitute low-carbon products for high-carbon ones. Carbon pricing mechanisms are predicated on the basis that profit-making firms will continue to cut emissions to the point where the marginal abatement cost is lower than the social cost of carbon.
- Revenue approach – where the tax rate is based on the revenue considerations of the regulating authority or by simply following a benchmarking approach where the tax rate is linked with the rate in neighbouring jurisdictions, among trading partners or competitors.
- International Crediting Mechanisms/ Baseline and Credit system – According to Kyoto Protocol, industrialized Annex B countries can purchase certified emission reduction (CER) credits from developing countries (each credit equivalent to one tonne of CO2).
- The Clean Development Mechanism – is the international standardized emissions offset instrument governed by the UNFCCC to facilitate trade on the global scale.
- Internal Carbon Prices – It is being used voluntarily by companies and organisations to safeguard against future shocks, climate related risks and prospective government regulations. It is commonly done via shadow carbon pricing where a hypothetical carbon cost is associated with each ton of CO2 emissions.

Implicit carbon pricing:

- Do not directly put a price on emitting carbon but set uniform performance standards for GHG abatement.
- Command-and-Control Regulations – employs technology and performance-based standards to control emission levels and protect environment quality.
- Clean Energy Standards (CES) – is a market-based and technology-neutral approach to encourage the power sector to switch to non- or low-emitting sources of energy.
- Eliminating Fossil Fuel Subsidies – gradual elimination of fossil fuel subsidies can be an effective way to achieve an optimal price for the fuel as well as provide incentives for energy efficiency and fuel-switching technologies.

Explicit carbon pricing:

- It is usually mandated by the government.
- It acts as a market signal for producers and consumers to move towards cleaner sources of production.
- These can be achieved through carbon taxes and/or an ETS (emission trading system)
- Carbon tax – A carbon tax imposes a fixed price on carbon emissions while the quantity of emission reduction is left to the market forces. The objective is to increase the cost of fossil fuel and provide an incentive for investments in fuel-switching strategies and energy-efficient technologies.
- Emission Trading System (ETS) – In a cap-and-trade model, the government sets a limit (cap) on the quantity of permissible emissions. While the quantity/volume of emissions is regulated, the price is determined by the market.

Global Carbon Pricing Mechanisms:

- Globally, 68 carbon pricing instruments (CPIs) are operating including countries like Chile, Switzerland, New Zealand, China, European Union etc.

Carbon pricing in India:

- In the case of India, the relevance of carbon markets has been underlined by the recent Energy Conservation (Amendment) Bill, 2022 which is momentous in its scope, empowering the government to establish a carbon credit trading scheme and laying the ground for a formal carbon market that can be instrumental in India's pathway towards a net-zero economy by 2070.
- PAT scheme – introduced in 2012, it is the flagship programme of the Bureau of Energy Efficiency (BEE), Ministry of Power.
- Energy-intensive industrial production units, called **"designated consumers"** (DC) are allotted Specific Energy Consumption (SEC) reduction targets over a cycle of three years.
- The units that exceed the targets are awarded **Energy Saving Certificates (ESCerts),** each equal to one metric tonne of oil.
- DCs that are unable to meet these targets can purchase the difference in ESCerts from the units that have exceeded their targets.
- The ESCerts can be traded on two power exchanges, namely, **Power Exchange India Limited (PXIL) and Indian Energy Exchange (IEX).**
- Emission trading scheme on an air pollutant – This is an innovative emission trading scheme on respiratory solid particulate matter(RSPM), the first particulate trading system in the world.
- The scheme has been piloted in Gujarat, Maharashtra, and Tamil Nadu.
- Pollution targets are set for areas based on ambient air quality standards and permits are allocated which can be traded, after verification, based on the gains and shortfalls from compliance.
- The scheme relies on a continuous emission monitoring system (CEMS) for setting the baseline and verification purposes.
- CEMs is an intrinsic element in the scheme's design as it provides real-time information and helps avoid issues pertaining to spot checking and/or spurious reporting by third party auditors.
- Carbon Cess – Introduced in 2010, levied on coal, lignite, and peat in the form of an excise duty.
- With the introduction of the GST Compensation Cess, the carbon cess was abolished .

- CO2 emitting products such as coal, kerosene, naphtha, lubes and LPG are included in GST with exceptions for five petroleum products, i.e., petrol, diesel, natural gas, ATF and crude oil. These are instead subjected to excise duties and VAT.
- Concern: The tax rates do not correspond with the carbon footprint of the fuels and thus fail to provide the right price signals to producers and consumers to reduce consumption and switch to low carbon-emitting sources of energy

Renewable Purchase Obligations (RPO) and Renewable Energy Certificates (REC)

- Electricity DISCOMS, open access consumers and captive power producers have to purchase a percentage of their electricity from renewable energy (RE) sources.
- These are termed as renewable purchase obligations (RPO) and are mandated by the Electricity Act (2003).
- The State Electricity Regulatory Commission is responsible for fixing the minimum RPO for each state.
- Obligated entities can purchase RECs on the national energy exchanges to meet their RPO targets without actual procurement of RE-generated power.
- It overcomes geographical disparity in renewable energy production and incentivises electricity generation from Resources beyond the RPO state limits.
- Concern: The enforcement and compliance with RPO remains weak and is a persisting obstacle to India's ambitions of expanding renewable energy production and procurement
- Excise taxes on Diesel and Petrol –
    - As of May 2020, India had the highest taxes on petrol and diesel in the world.
    - **Concern:** The high taxes are on account of the Centre's revenue requirements and not environmental considerations and do not account for the carbon footprint of the fuels.

Significance of Carbon pricing:

- Putting a price on carbon internalizes the social cost of carbon, and compels companies to adjust their investment portfolio and production methods while encouraging consumers to alter behavioural patterns.
- A carbon price is deemed as an effective tool to incentivise future investment, consumption and innovation towards sustainable and climate-friendly pathways, and support a sustainable pandemic recovery. In 2021, approximately USD 84 billion was recorded in carbon pricing revenue, as a result of higher carbon prices, increased auctioning from emissions trading, and revenue from new instruments.
- Moreover, carbon pricing can be a useful fiscal tool and a prominent source of augmenting government revenues.
- Typical carbon pricing policies allocate government revenues in three ways: investment in climate-related clean technologies, general budget, and income tax cuts or rebates.
- Investments in sustainable industries can generate three times as many full-time jobs from government spending in fossil fuels.
- In the context of developing economies, these investments become particularly critical for supporting vulnerable sectors and communities to adapt to climate change and achieve just transitions.
- Pre-emptively, designing effective domestic climate policies inclusive of carbon pricing mechanisms—such as the EU Carbon Border Adjustment Mechanism—can also help offset the implications of border tariffs.
- The revenues generated from selling allowance certificates will augment fiscal revenues and can be used to reduce distortionary taxes or finance investments in clean-tech programs.

Way forward:

- Careful planning is essential using rigorous quantitative modelling and analysis from the data collected via the pilot projects.
- Both the GST regime and the PAT scheme provide a well-functioning machinery which India can leverage to build upon a strong carbon pricing framework using a combination of both a carbon tax and an emission trading system.
- In the context of India, it can help meet its ambitious current and future climate goals, offer emission reduction at the lowest possible cost, and accelerate progress on the **Sustainable Development Goals (SDGs).**

- Global climate policy groups have been debating the inception of a Climate Club, seeking to establish an international target carbon price (incremental in nature),
- The current G20 Troika, led by three developing countries – Indonesia, India and Brazil, presents a unique and apposite moment to push forward a global carbon pricing framework built with a redistributive mechanism.
- The principles of **Common but Differentiated responsibilities (CBDR)** and the Just Transition Declaration, climate policy architecture and designing domestic carbon policies will hold India in good stead in an increasingly decarbonising future.

Land Degradation and Desertification

Context: The government is planning to bring convergence between the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) to restore degraded land and reverse desertification in India.

- According to the Desertification and Land Degradation Atlas 2021, at least 30% of India's total geographical area is under the category of "degraded land".

Land degradation and Desertification :

- It is a temporary or permanent degeneration of productivity of land due to physical, chemical or biological factors.
- Desertification is a form of land degradation by which fertile land becomes desert.
- It leads to the advancement of sand from the desert to the adjoining regions.

Causes of Land Degradation and Desertification:

- Land degradation is caused by multiple forces, including extreme weather conditions, particularly drought.
- It is also caused by human activities that pollute or degrade the quality of soils and land utility.

Impact of Land degradation and Desertification:

Environmental Impact:

- Land degradation and Desertification results in problems like soil erosion, loss of natural nutrients, water-logging and salinity and contamination of ground and surface water.
- Loss of Fertility due to the use of various scientific inputs like irrigation, fertilizers, pesticides etc. Unscientific cropping practices are also causing harm.
- Waterlogging happens when the water table gets saturated for various reasons—over-irrigation, seepage from canals, inadequate drainage etc.

Potential Impacts on Human Health:

- It negatively affects food production, livelihoods, and the production and provision of other ecosystem goods and services.
- higher threats of malnutrition from reduced food and water supplies; more water- and food-borne diseases that result from poor hygiene and a lack of clean water.

Global Efforts to Combating Land Degradation:

United Nations Convention on Combating Desertification (UNCCD):

- Established in 1994 aim to protect and restore our land and ensure a safer, just, and more sustainable future.
- The UNCCD is the only legally binding framework set up to address desertification and the effects of drought.
- There are 197 Parties to the Convention, including 196 country Parties and the European Union.
- The Convention is based on the principles of participation, partnership and decentralization.

Bonn Challenge:

- It is a global goal to bring 150 million hectares of degraded and deforested landscapes into restoration by 2020 and 350 million hectares by 2030.
- Launched by the Government of Germany and IUCN in 2011, the Challenge surpassed the 150-million-hectare milestone for pledges in 2017.

Great Green Wall Initiative:

- Launched in 2007 by the African Union, being implemented across 22 African countries
- Aim: To restore the continent's degraded landscapes and transform millions of lives in the Sahel.
- Objective: To restore 100 million hectares of currently degraded land; sequester 250 million tons of carbon and create 10 million green jobs by 2030.

Indian Initiatives:

National level land degradation mapping:

- It is taken up by ISRO along with partner institutions, under the Natural Resources Census (NRC) mission of DOS/ISRO, towards generating information on land degradation at 1:50,000 scale, using 23m resolution (multi-temporal & multi-spectral) IRS data.

Desertification and Land Degradation Atlas of India:

- Published by: Space Application Centre (SAC), ISRO, Ahmedabad.
- Provides a state wise area of degraded lands for the time frame 2018-19.
- Provides the change analysis for the duration of 15 years, from 2003-05 to 2018-19.
- United Nations Convention on Combating Desertification (UNCCD)
- India is a signatory to the UNCCD.
- India hosted the 14th session of Conference of Parties (COP 14) of United Nations Convention to Combat Desertification (UNCCD) in September 2019.
- India is striving towards achieving the national commitments of Land Degradation Neutrality (LDN) and restoration of 26 million ha of degraded land by 2030 which focus on sustainable and optimum utilisation of land resources.
- Nodal Ministry for the Implementation: Ministry of Environment, Forest and Climate Change (MoEF&CC)

Bonn Challenge:

- At the United Nations Framework Convention on Climate Change Conference of the Parties (COP) 2015 in Paris, India joined the voluntary Bonn Challenge and pledged to bring into restoration 13 million hectares of degraded and deforested land by 2020, and an additional 8 million hectares by 2030.

Flagship Schemes:

- Pradhan Mantri Fasal Bima Yojana
- Soil Health Card Scheme
- Suggestion for Convergence: Using MGNREGA Funds
- Presently, activities such as ridge area treatment, drainage line treatment, soil and moisture conservation, rainwater harvesting, nursery raising, afforestation, horticulture and pasture development are done under the Department of Land Resources, the Ministry of Rural Development.
- The Union government now wants the States to undertake these activities using MGNREGA funds, which go towards both material and wage components.

Way Forward:

- Combating desertification and land degradation and mitigating the effects of drought will secure long-term socio-economic benefits for people living in the drylands and reduce their vulnerability to climate change.
- Land Degradation Neutrality (LDN)—with conservation, sustainable use, and restoration as its three pillars—provides an effective framework.
- Creating an enabling environment for LDN can help policymakers and planners to navigate social, economic, and environmental trade-offs so food security, energy needs, land tenure, gender equality, access to clean water, and biodiversity are considered—and addressed—together.

Eco-sensitive Zones (ESZ)

Context: Recently, the Supreme Court (SC) directed that every protected forest, national park and wildlife sanctuary across the country should have a mandatory eco-sensitive zone (ESZ) of a minimum one km starting from their demarcated boundaries.

Eco Sensitive Zone (ESZ):

- The Eco-Sensitive Zone (ESZ) are areas in India notified by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India around Protected Areas, National Park and Wildlife sanctuaries.
- To create some kind of "shock absorbers" to the protected areas by regulating and managing the activities around such areas.
- Therefore, these areas act as a buffer for protected areas and reduce developmental pressures around a wildlife sanctuary or national park.
- They also act as a transition zone from areas of high protection to areas involving lesser protection.

Range:

- All identified areas around Protected Areas and wildlife corridors to be declared as ecologically fragile under the Environment (Protection) Act, 1986 (National Wildlife Action Plan, 2002-2016).
- Eco-sensitive Zone could go upto 10 Kms around Protected Areas.
- In cases where sensitive corridors, connectivity and ecologically important patches, crucial for landscape linkage, are even beyond 10 Kms width.
- Further, Eco-sensitive zones may not be uniform all around and it could be variable width and extent.

Prohibited activities:

- Activities like industries which cause pollution Commercial mining, saw mills, establishment of major hydroelectric projects (HEP), commercial use of wood, Tourism, discharge of effluents or any solid waste or production of hazardous substances are all prohibited.

Regulated activities:

- Activities like felling of trees, establishment of hotels and resorts, commercial use of natural water, erection of electrical cables, drastic change of agriculture system, e.g., adoption of heavy technology, pesticides etc., widening of roads.

Permitted activities:

- Activities like ongoing agricultural or horticultural practices, rainwater harvesting, organic farming, use of renewable energy sources, adoption of green technology for all activities are permitted.

Significance of Eco Sensitive Zone (ESZ):

- ESZs help in in-situ conservation, which deals with conservation of an endangered species in its natural habitat. For example, the conservation of the One-horned Rhino of Kaziranga National Park, Assam.
- They minimize forest depletion and man-animal conflict.

- The protected areas are based on the core and buffer model of management, through which local area communities are also protected and benefitted.

Significance of Recent Judgment:

- It can lead to more sustainable development.
- Tribal rights will also be protected with the recent judgment i.e., their culture, diversity etc will be preserved.

Challenges Ahead:

Developmental activities:

- Activities such as construction of dams, roads, urban and rural infrastructures in the ESZ, create interference, negatively impact upon the environment and imbalance the ecological system.

Blatant violations:

- To cater to the increasing demand for eco-tourism, land around parks and sanctuaries is being cleared through deforestation, displacement of local people etc.
- Failing to recognize the rights of forest communities and curbing poaching of animals, environmental legislations undermine the ESZs in favour of developmental activities.

Climate Change:

- Biodiversity and climate change are interconnected, for example, the rise in global temperature has generated land, water and ecological stress on the ESZs.

Tourism related Pollution:

- As the pressure of tourism is rising, the government is developing new sites and gateways to the ESZ. The tourists leave behind garbage such as plastic bags and bottles etc. which lead to environmental degradation.

Local communities:

- Slash and burn techniques used in agriculture, pressure of increasing population and the rising demand for firewood and forest produce, etc. exerts pressure on the protected areas.

Way Forward:

- The Centre needs to come up with a plan to incentivise farmers for sticking to green practices in Eco Sensitive Zones (ESZs).
- Communities living around Protected Areas in several states should promote conservation of Eco Sensitive Zones (ESZs).
- There is a need for rethinking on the impacts of the environmental policies at the local level and prospects of local participation.

India's Burning Issue Sustainably

Context: The monsoon has receded, and North India is bracing for a smoggy winter. And with that the feverish focus on crop stubble burning has returned to India's public discourse.

- Like each year, discussions have begun on how bad this year's stubble burning season will likely be and what potential ad hoc techno-fixes could solve the issue — in the short term.

About Stubble Burning:

- Stubble (parali) burning is a method of removing paddy crop residues from the field to sow wheat from the last week of September to November. Stubble burning is a process of setting on fire the straw stubble, left after the harvesting of grains, like paddy, wheat, etc. It is usually required in areas that use the combined harvesting method which leaves crop residue behind.
- The process of burning farm residue is one of the major causes of air pollution in parts of north India, deteriorating the air quality.
- Along with vehicular emissions, it affects the Air Quality Index (AQI) in the national capital and NCR. Stubble burning by farmers in Haryana, western Uttar Pradesh and Punjab in north India is considered a major cause of air pollution in Delhi and its adjoining regions.
- Paddy stubble burning is practiced mainly in the Indo-Gangetic plains of Punjab, Haryana, and UP to clear the fields for rabi crop sowing.

Why does this problem of stubble burning occur?

Crop duopoly:

- The root cause of stubble burning can be traced back to the 1960s-70s, when to meet the urgent challenge of feeding its rapidly growing population, India introduced several measures as part of its Green Revolution.
- The Green Revolution transformed the way agriculture was practiced, especially in Punjab and Haryana. The economics of high-yielding varieties of paddy and wheat, supported by a guaranteed buyer (the government)and minimum support prices led to a crop duopoly oriented solely around increasing caloric intakes, supplanting the earlier diversity of crops grown in the region.

Introduction of subsidies:

- Further policy moves in subsequent decades, which included the introduction of subsidies for electricity and fertilizers, and ease of access for credit in agriculture only served to cement this duopoly.

Government policy:

- In an attempt to address the growing water crisis, the Punjab and Haryana governments introduced laws around water conservation, encouraging farmers to look to the monsoon rather than groundwater to irrigate their crops.
- The shortened harvesting season that arose resulting from a not clearly thought-out policy move brought about the need for farmers to rapidly clear their fields between the kharif and rabi crops; the quickest of these ways was to burn off the remaining stubble post-harvest.

Government Interventions to reduce crop residue burning:

Banning Crop Residue Burning:

- Crop residue burning was notified as an offense under the Air Act of 1981, the Code of Criminal Procedure, 1973 and various appropriate Acts.
- In addition, a penalty is being imposed on any offending farmer. Village and block-level administrative officials are being used for enforcement.

Establishment of a Marketplace for Crop Residue:

- Efforts are being made to increase the avenues for the alternate usage of paddy straw and other crop residue. For instance, paddy straw has a considerable calorific value, making it suitable for use as a fuel in biomass based power plants.
- Similarly, it can be utilized for the preparation of biofuels, organic fertilizers and in paper and cardboard making industries. The strategy, broadly, is to assign a real economic and commercial value to the agricultural residue and make burning it an economic loss to the farmer.

Public Awareness Campaigns:

- There are ongoing efforts to highlight the health effects of crop residue burning. It produces extremely high levels of toxic particulates, which affect the health of the people in the direct vicinity of the burning.
- In addition, efforts are also being made through kisan camps, trainings and workshops, apart from campaigns through various print media, televised shows and radio telecast, in informing farmers about the alternative usage of crop residue.

Subsidy on Agri-implements:

- The state governments, in collaboration with the Centre, has rolled out schemes for providing subsidy on mechanical implements that help tillage of soil, so that the crop residue can be retained in the soil, adding to its fertility, or alternately, collection of crop residue for putting it to commercial usage.

Crop Diversification:

- There are various ongoing, long-term efforts at diversification of cropping techniques, such that crop residue burning can be effectively prevented. This is being attempted through cultivation of alternate crops (apart from rice/paddy and wheat) that produce less crop residue and have greater gap periods between cropping cycles.

Pusa Decomposer:

- Pusa Decomposer, a microbial consortium of fungal species (both in liquid and capsule forms) developed by ICAR, has been found effective for rapid in-situ decomposition of paddy straw.
- The decomposers are in the form of capsules made by extracting fungi strains that help the paddy straw to decompose at a much faster rate than usual.
- It involves making a liquid formulation using decomposer capsules and fermenting it over 8-10 days and then spraying the mixture on fields with crop stubble to ensure speedy bio-decomposition of the stubble.
- It takes around 20 days for the degradation process to be completed.
- It does not give enough time for farmers to prepare fields for the wheat crop on time.

Crop Residue Management:

- The Centre introduced the Crop Residue Management (CRM) scheme in 2018-19, under which financial assistance @ 50 per cent is provided to the farmers for purchase of CRM machinery and @ 80 per cent to Cooperative Societies, FPOs and Panchayats for establishment of CHCs.
- The scheme promotes usage of machines such as Super Straw Management Systems, Happy Seeder, Super Seeder, Smart Seeder, zero till seed-cum-fertilizer drill, Mulcher, Paddy Straw Chopper, hydraulically reversible mouldboard plough, crop reapers and reaper binders.

Way Forward:

- More recently, however, with concerted focus on the subject, a series of short-term ex-situ and in-situ solutions have been rolled out by the Union and State governments.

- Economic incentives to reduce burning have also been tested with limited success. With crores invested in these solutions over the last five years, we have yet to see any significant improvement in the situation.
- Driven largely by short-term thinking, these techno-fixes or alternative uses work at the margins, without addressing the root cause.
- The entire value-chain of agriculture in the region needs to change if air quality, water, nutrition, and climate goals are to be addressed.
- In practical terms, this means substantially reducing the amount of paddy being grown in the region and replacing it with other crops that are equally high-yielding, in-demand, and agro-ecologically suitable such as cotton, maize, pulses and oil seeds.
- It will also require building trust with farmers to ensure they are seen as partners (rather than perpetrators) and providing them the financial support necessary.
- At a policy level, it also requires recognising that agriculture, nutrition, water, the environment, and the economy are all deeply intertwined in the era of the Anthropocene. One cannot be addressed in a silo without having second and third order effects on the other.

Therefore, taking the long view on this would also mean establishing a mechanism for intersectoral policymaking that aligns our goals for sectoral policy within the broad frame of sustainable development we wish to follow.

A Renewable Energy Revolution, Rooted in Agriculture

Context: The beginnings of a renewable energy revolution rooted in agriculture are taking shape in India with the first bio-energy plant of a private company in Sangrur district of Punjab having commenced commercial operations recently. It will produce Compressed Biogas (CBG) from paddy straw, thus converting agricultural waste into wealth.

About Bioenergy:

- Bioenergy is renewable energy made available from organic materials derived from biological sources. It is the energy derived from biomass such as bagasse, cotton stalk, coconut shell and wood, plants, etc.

Compressed Biogas (CBG):

- Bio-gas is produced naturally through the process of anaerobic decomposition from waste and biomass sources like agriculture residue, cattle dung, municipal solid waste, sugarcane press mud, sewage treatment plant (STP) waste, etc.
- It is called CBG after biogas is purified and compressed, which has pure methane content of over 95%. CBG is exactly similar to commercially available natural gas in its composition and energy potential. Its calorific value and other properties are similar to CNG.

The need for CBG:

- It has become common practice among farmers in Punjab, Haryana and western Uttar Pradesh to dispose of paddy stubble and the biomass by setting it on fire to prepare fields for the next crop, which has to be sown in a window of three to four weeks. The resultant clouds of smoke engulf the entire National Capital Territory (NCT) of Delhi and neighbouring States for several weeks between October to December. This plays havoc with the environment and affects human and livestock health.
- The Capital's air quality index (AQI) deteriorated slightly and continued to be in the "poor" category on Tuesday, according to the Central Pollution Control Board (CPCB) data of October 2022.
- Meanwhile, recently the Delhi government started spraying Pusa bio-decomposer solution in paddy fields in the city to reduce stubble burning. The Commission for Air Quality Management in NCR and Adjoining Areas (CAQM) recently announced an immediate ban on all construction and demolition activity unregistered with the authority.

Some measures:

- The Government of India has put in place several measures and spent a lot of money in tackling the problem. The Commission for Air Quality Management in the National Capital Region and Adjoining Areas (CAQM) had developed a

framework and action plan for the effective prevention and control of stubble burning. The framework/action plan includes:

- in-situ management: incorporation of paddy straw and stubble in the soil using heavily subsidized machinery (supported by crop residue management (CRM) Scheme of the Ministry of Agriculture and Farmers Welfare).
- Ex-situ management, i.e., CRM efforts include the use of paddy straw for biomass power projects and co-firing in thermal power plants, and as feedstock for 2G ethanol plants, feed stock in CBG plants, fuel in industrial boilers, waste-to-energy (WTE) plants, and in packaging materials, etc.
- Additionally, measures are in place to ban stubble burning, to monitor and enforce this, and initiating awareness generation. Despite these efforts, farm fires continued unabated.

A project in place

Ex-situ uses of rice straw:

- In its search for a workable solution, NITI Aayog approached FAO India in 2019 to explore converting paddy straw and stubble into energy and identify possible ex-situ uses of rice straw to complement the in-situ programme.
- The results suggest that to mobilize 30% of the rice straw produced in Punjab, an investment of around ₹2,201 crore would be needed to collect, transport and store it within a 20-day period. This would reduce greenhouse gas (GHG) emissions by about 9.7 million tonnes of CO_2 equivalent and around 66,000 tonnes of PM 2.5.

Pellets:

- A techno-economic assessment of energy technologies suggested that rice straw can be cost-effective for producing CBG and pellets. Pellets can be used in thermal power plants as a substitute of coal and CBG as a transport fuel.
- The Union Environment Ministry recently announced a ₹50 crore scheme to incentivise industrialists and entrepreneurs to set up paddy straw palletisation and torrefaction plants.
- Paddy straw made into pellets or torrefied can be mixed along with coal in thermal power plants.
- This saves coal as well as reduces carbon emissions that would otherwise have been emitted were the straw burnt in the fields, as is the regular practice of most farmers in Punjab and Haryana.

SATAT Scheme:

- With 30% of the rice straw produced in Punjab, a 5% CBG production target set by the Government of India scheme, "Sustainable Alternative Towards Affordable Transportation (SATAT)" can be met.

SATAT has following four objectives:

- Utilizing more than 62 million metric tonnes of waste generated every year in India,
- Cutting down import dependence,
- Supplementing job creation in the country
- Reducing vehicular emissions and pollution from burning of agricultural / organic waste.
- From paddy stubble, CBG valued at ₹46 per kg as per the SATAT scheme will be produced. Paddy straw from one acre of crop can yield energy output (CBG) worth more than ₹17,000 — an addition of more than 30% to the main output of grain. This initiative is an ideal example of a 'wealth from waste' approach and circular economy.

Way forward:

- There are several other benefits of adopting CBG for a renewable energy revolution:
- The slurry or fermented organic manure from the plant (CBG) will be useful as compost to replenish soils heavily depleted of organic matter, and reduce dependence on chemical fertilizers.
- The plant will also provide employment opportunities to rural youth in the large value chain, from paddy harvest, collection, baling, transport and handling of biomass and in the CBG plant.

- Every year, about 27 million tonnes of paddy straw is generated in Punjab and Haryana. About a third of this straw is from non-basmati rice, which cannot be fed to cattle as fodder because of its high silica content. This is usually burnt which adds to the air pollution crisis in Delhi NCR and adjoining areas. So, converting it into CBG is the last resort.

From the point of view of environmental benefits, renewable energy, value addition to the economy, farmers' income and sustainability, this initiative is a win-win situation. It is replicable and scalable across the country and can boost the rural economy.

Rainwater Harvesting

Context: The NITI Aayog report (2018) says that India's water demand will exceed water supply by a factor of two by 2030.

- The major source of water supply is groundwater for most regions in India and rapidly depleting groundwater levels call for urgent attention for ensuring water security in the coming years.
- India covers around 2.45% of the world's surface area and has 4% of the world's water resources.
- In India, rainfall is the primary source of freshwater.
- For a country of its size, India receives the second most amount of rainfall.
- India receives an average of 1,170 millimeters (46 in) of rain per year, which equates to around 4,000 cubic kilometers (960 cu miles) of rain per year, or about 1,720 cubic meters (61,000 cu feet) of freshwater per person.

About Rainwater Harvesting:

- The rainwater harvesting process incorporates collection and storage of collected rainwater with the help of artificially designed systems.
- Rainwater harvesting systems consists of the following components
- Catchment- Used to collect and store the captured rainwater.
- Conveyance system – It is used to transport the harvested water from the catchment to the recharge zone.
- Flush- It is used to flush out the first spell of rain.
- Filter – Used for filtering the collected rainwater and removing pollutants.
- Tanks and the recharge structures: Used to store the filtered water which is ready to use.

Some traditional water harvesting techniques:

- Kuls: Often spanning long distances, with some over 10 km long, kuls have been around for centuries. They are present in mountain areas Jammu, Himachal Pradesh.
- Tanka system: it is used in Rajasthan, which is a cylindrical ground pit that receives rainwater from the nearby catchment area.
- Virdas-Virdas are shallow wells dug in low depressions called jheels (tanks), they are found in Rann of Kutch area in Gujarat.
- Madaka-It is a unique structure constructed on the upper reaches of undulating topography
- Khadin- a very long (100-300 m) earthen embankment built across the lower hill slopes lying below gravelly uplands.
- Bamboo drip irrigation: used in the northeast, suitable for irrigation in hilly terrains.
- Tanks in Karnataka: these are artificial reservoirs to store water taking advantage of depression.
- Zing -Tanks: for collecting water from melted ice in Ladakh.
- Stepwell: these are found in Rajasthan and Gujarat.
- Baoris / bers – they are community wells in Rajasthan.
- Apatani –Terraced plots connected by inlet and outlet channels in Arunachal Pradesh.
- Pyne-ahar: system of south Bihar on which the cultivation of paddy depends.

Declining groundwater is a concern:

- According to the **World Water Development Report 2015 (UNESCO),** India is a frontrunner in groundwater extraction.

- The water table is going down in several areas and there are many reasons for this decline
    - Overexploitation of shared water resources.
    - Mismanagement of water resources.
    - Climate change impact.
- Several metropolitan cities are already facing difficulties meeting water demand due to high population density and limited water resources.
    - For example, Delhi has a water supply of approximately 930 million gallons a day (mgd) while its demand is 1,380 mgd.
    - The Delhi Jal Board (DJB) plans to meet this growing demand through groundwater sources which will lead to over-exploitation of groundwater sources.

Government efforts to reduce groundwater depletion:

- For improving access to water, the government has given special focus to implementing "source sustainability measures" such as
    - Recharge and reuse through grey water management.
    - Water conservation.
    - Rainwater harvesting (RWH)
- A campaign to "Catch the rain, where it falls, when it falls", has been launched which aims to create appropriate rainwater harvesting structures.
- Several government schemes such as Atal Bhujal Scheme are focusing on aquifer mapping to construct artificial reservoirs and rainwater harvesting structures.
- These mapping techniques consider hydrogeology and source water availability.

Significance of rain water harvesting:

- **Ensuring Food Security:**
    - Modern hybrid crops & fertilizer depend on continuous supply of irrigation water.
    - More than 60% of net sown area in India is rainfed and to address the rising cases of drought in the dry belt of India and ensure food security RWH is essential.
- More than 3/4th of the precipitation In India occurs during 4 months of monsoon season and significant part of which is lost in runoff and evaporation, this can be controlled by rain water harvesting.
- Rapid urbanization and Industrial development demands huge water hence severe water crunch can be addressed by water harvesting.
- In dry and hilly areas women face hardship in fetching water and in such remote areas RWH can provide a decentralized source of water which would reduce their hardships.

Way Forward:

- There is a need to enhance efforts to reduce dependency on groundwater with a focus on
    - Enhancing water security.
    - Rejuvenation and recharge of natural and constructed water bodies.
    - Increased reuse of treated wastewater through local sewage treatment plants.
- Build well-designed rainwater harvesting systems across residential and commercial areas.
- These efforts must be facilitated by cooperation of Central and State governments.
- There is a need for stringent policy initiatives for long-term and sustainable solutions.
- An integrated water management plan must be brought up by local bodies and implemented at the local level.
- Therefore, the need of the hour is to promote rainwater harvesting using a mix of traditional ecologically safe, viable and cost-effective systems with modern rainwater saving techniques, such as percolation tanks, injection wells and subsurface barriers to rejuvenate India's depleted water resources. But using only traditional methods is not enough. Productively combining these structures could be the answer to India's perennial water woes.

SOCIAL ISSUES

India and Pluralism

Context: In the diverse society of India, pluralism is crucial for its smooth functioning. A pluralist democracy, allowing the masses the freedom of association, is necessary for the democratic culture to flow.

Meaning of Pluralism

- Pluralism is an understanding of social diversity. It could be a nation's cultural, political, or philosophical posture.
- In any of these types, pluralism provides an account of social context appreciated as a relationship of contradictory and competing positions that cannot be seamlessly condensed or reduced to a single institutional system.
- We have intense pride for Ajanta caves, the Kashi temple, the Taj Mahal, Gommatesvara of Shravanabelagola, the Golden Temple of Amritsar, etc. Though they embody different faiths, there is a sense of the emotional experience of being Indian. This explains the plurality of beliefs.
- Concerning language, India never had a monopoly on one language. Various local, regional, national and international languages are spoken and learnt by Indians. We have the willingness to learn different languages. Indian culture encourages the learning abilities of several streams at a time and does not discard one for the other.
- Religious Plurality: We do not adhere to the policy of worshiping one God throughout India or following one religion with one or two sects. Each community and caste have different Gods to worship and follow their customs and traditions.
- Even politically, India was at no time ruled by one royal power, except in times of Ashoka or under the British. Various royal families ruled their territories simultaneously. They all ruled their domains but looked for an opportunity to overpower the other.
- For Example, when the Mughals were ruling North India, the Vijayanagar rulers in the south and the Bahmani rulers in parts of Deccan and Central India were ruling their territory simultaneously.
- At present, Indian democracy is unique for its multi-political party system.
- The storyline, contents, characters, messages, and lessons we draw from our epics like Ramayana and Mahabharata are not confined to one geographical area.
- In present day, an Indian lives with many identities, such as you can be a Kannadiga or Punjabi, Goan, a Hindu, Muslim or a Christian, etc. They all have their identities within the structure of homogeneous living.
- So, in many ways, plurality exists by way of co-existence and not by confrontations.

India's Rich Pluralistic History

- One of the most glorious aspects of India's pluralist cultural history is the treatment that her states and people gave to the religious and minority groups that came to India as refugees.
- Persecuted by their own countries with sacred places destroyed and fellow beings being massacred, the Jews, the Zoroastrians, the Tibetans, etc.
- Our age-old traditions of tolerance and hospitality attracted them and they found their hopes and aspirations fulfilled.
- Rigidity and exclusiveness are unending sources of inter-cultural conflicts. Rigid cultures behave like billiard balls as they meet to collide only. The resilience and adaptability nurtured by pluralism in India led to assimilation and synthesis, which enriched our unique culture.

Uniqueness of Indian Pluralistic Culture

- Cultural means the total accumulation of material objects, ideas, symbols, beliefs, sentiments, values, and social forms which are passed from one generation to another in any given society
- The history of Indian culture goes back to more than 5,000 years, which shows that its subtle with a strong thread of unity that runs through the boundless plurality of her life

- Good governance was always considered a necessary prerequisite for people's happiness. So the rulers bestow happiness and prosperity on people, always treading the path of righteousness in governing the state.
- India is an agricultural society; the people's joy is linked with the well-being of agriculture and cattle. For the satisfaction of all, the Pancha mahabhutas such as Prithvi – the earth, Akasha – the sky, Jala- water, Vayu – air and Agni – fire are pacified and revered. All these rudiments are adored in rituals, pilgrimages, and festivals and are respected in life in Indian culture.
- Ahimsa – all religions upheld Non-violence, especially in Jainism and Buddhism. Many freedom fighters had championed the cause of ahimsa by waging war against the British during our freedom struggle.
- Another perennial value that Indian culture has taught is the universal brotherhood, which is now being called global consciousness covering the whole world as the foundation of Indian culture.
- The old concept of 'Unity in Diversity' has been conserved over the years.
- Unlike many other post-colonial societies, India chose a pluralistic constitution at independence despite complex counterbalancing pressures after a bloody partition in 1947 based on the two-nation theory.
  - The Constitution of India continues to endure as a standard in public life and enjoys legitimacy among India's diverse groups.

Abortion rights vs Ethics

Context: Recently, in a landmark judgment, the Supreme Court of India allowed abortions up to 24 weeks for all women, including unmarried women.

Abortion Rights and the Ethical Dilemma:

Issues with Respect to Women's Right:

Woman's Right over her Body:

- A woman's right over her body has been advocated as a premise for freedom.
- One cannot force a woman to bear a child in her womb and give birth to a child if she does not want to do so for various reasons.

Women's Health:

- Unwanted pregnancies affect both physical and mental health.

Gender Equality:

- The right to abortion is vital for gender equality.
- The right to abortion should be part of a portfolio of pregnancy rights that enables women to make a truly free choice whether to end a pregnancy.

Issues with respect to Foetus:

- Right to Life (Article 21): Abortion amounts to the murder of a living being.
- Motherly Care: It is a unique unspoken bond shared between two lives, which cannot be questioned or regulated by laws.

Issues with respect to Society in General:

- Responsibility of State: The State has the responsibility of valuing each life.
- Inclusion of all: Abortion should not become a mechanism of social control for avoiding the appearance of differences or disabilities.
- Giving better life for Existing Children: Many times, parents want abortion to be able to give a good life to existing children instead of dividing their meagre resources into more children.

What are the Arguments against Abortion?

- Abortion is not viewed by some as liberating, but rather as a way for society not to cater to women's needs.
- Women don't need free abortion access, but their needs for financial and social survival as mothers are what they need for equality:
- inexpensive, readily available childcare
- a workplace or school that acknowledges the needs of mothers,
- providing flexible scheduling and maternity leave,
- state support that helps to reintegrate a woman into the workforce

India's Stance on Abortions:

- The Medical Termination of Pregnancy (Amendment) Act, 2021 ensures that expectant mothers exercise self-determination in welcoming new life to their homes.
- Abortions may be performed up to 24 gestational weeks on grounds of risk to the mother's life, mental anguish, rape, incest, contraception failure or the diagnosis of foetal abnormalities.
- It is a liberal achievement over countries where abortions are disallowed since conception, even in the most traumatising of circumstances of sexual abuse or incest.

Way Forward:

- Ethical approaches to abortion frequently invoke four principles.
  - Respect for patients' autonomy
  - Nonmaleficence (do no harm)
  - Beneficence (beneficial care) and
  - Justice
- The abortion dilemma has overlapping issues from different realms like legal, medical, ethical, philosophical, religious and human rights and it should be analysed from different perspectives.
- There cannot be any hard and fast rule over abortion and it must be discussed and deliberated to evolve a common consensus.

Livestock sector - Role of Women

Context: On the International Day of Rural Women (October 15), we need to recognise the role of women in livestock rearing, and to include women in all facets of livestock development, be it breeding, veterinary care, extension services, training or access to credit and markets.

- The livestock sector is one of the most rapidly growing components of the rural economy of India, accounting for 5% of national income and 28% of agricultural GDP in 2018-19.
- In the last six years, the livestock sector grew at 7.9% (at constant prices) while crop farming grew by 2%.
- Studies show that in rural households that own livestock, women are invariably engaged in animal rearing.
- It is widely recognised that the majority of women workers in rural areas (72%) are engaged in agricultural activities.

An underestimation:

- To illustrate, 12 million rural women were workers in livestock-raising, an estimate based on the Employment and Unemployment Survey of 2011-12. However, with the augmented definition, it was estimated that around 49 million rural women were engaged in livestock raising.
- The National Livestock Policy (NLP) of 2013, aimed at increasing livestock production and productivity in a sustainable manner, rightly states that around 70% of the labour for the livestock sector comes from women.
- One of the goals of this policy was the empowerment of women.
- However, the NLM does not propose any schemes or programmes specific to women livestock farmers. The policy proposes that the State government allocates 30% of funds from centrally-sponsored schemes for women.

Core problems:

- The problem clearly is that women livestock farmers are not visible to policymakers, and one reason is the lack of gender-disaggregated data.
- First, recent employment surveys such as the Periodic Labour Force Survey fail to collect data on specific activities of persons engaged primarily in domestic duties. So, the undercounting of women in the livestock economy continues.
- Second, the reach of extension services to women livestock farmers remains scarce. According to official reports, 80,000 livestock farmers were trained across the country in 2021, but we have no idea how many were women farmers.
- Around 15 lakh new Kisan Credit Cards (KCC) were provided to livestock farmers under the KCC scheme during 2020-22. There is no information on how many of them were women farmers.
- Fourth, women livestock farmers lacked technical knowledge on choice of animals (breeding) and veterinary care.
- Fifth, village studies showed that women were not aware of the composition and functions of dairy boards and that men exercised decisions even in women-only dairy cooperatives. Further, the voice of women from landless or poor peasant Scheduled Caste households was rarely heard.

Way Forward

- Efforts are needed to correct gender biasness, increase the capacity of women to meet their strategic needs and to document systematically their inputs and outputs.
- They should be promoted to participate in outside exposure activities like marketing, selling and purchasing of animals.
- Seven important pillars of women empowerment are: decision making, access to knowledge, self-esteem, credit facility, livestock services, social support, market accessibility and asset ownership.
- Training should be organized for women farmers to remove their knowledge gaps regarding specific animal husbandry activities.

Women's labour is critical to the livestock economy. It follows then that women should be included in every stage of decision-making and development of the livestock sector.

Child Marriage

In News: Launching a nationwide campaign against child marriage from Rajasthan, Nobel Peace Laureate Kailash Satyarthi has appealed to the nation to initiate collective action against child marriage to end the social evil.

Context: The Kailash Satyarthi Children's Foundation (KSCF) will spearhead the campaign.

- As part of the campaign, 70,000 women and girls led people in lighting lamps, torchlight processions in around 10,000 villages (6,015 villages by KSCF and rest by government and other agencies) from over 500 districts in 26 states.
- The campaign was launched with another Nobel Peace Laureate, Leymah Gbowee.
- The 'Child Marriage Free India' campaign has three major objectives — to ensure the strict implementation of law; to enhance participation of children and women and ensure their empowerment through giving them free education till the age of 18; and to provide safety to children against sexual exploitation.
- Government agencies, including the Railway Protection Force, Women and Child Development Department of 14 states, state child protection authorities, state legal services authorities, Anganwadis and district administration of several state governments joined the campaign.

Child marriage in India:

- Child marriage usually refers to a social phenomenon where a young child (usually a girl below the age of fifteen) is married to an adult man.
- The second form of practice of child marriage is that in which the parents of the two children (the girl and boy) arrange a future marriage.

One in two women (age 20-24 years) in six states continue to get married before legal age of marriage

Lowest Himachal Pradesh: 9.1%
Highest Bihar: 68.2%

Per cent

Source: DLHS, 2007-2008
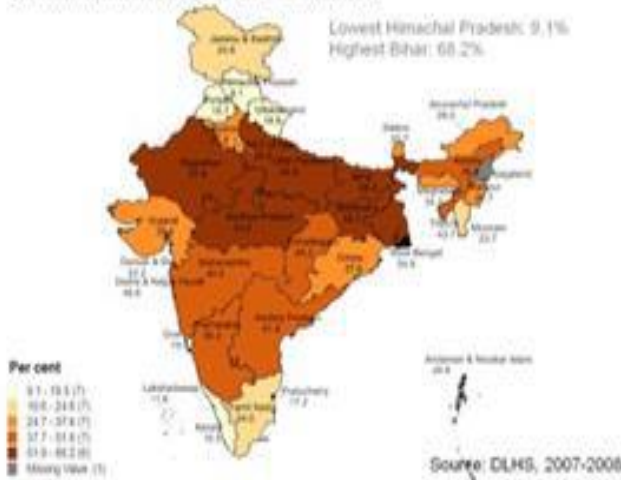
- In this practice, the individuals (the boy and girl) do not meet one another until they reach the marriageable age, when the wedding ceremony is performed.

- Child marriage prevalence is generally defined as the percentage of women 20-24 years old who were married or in union before age 18.

- As per law, the marriageable age is 21 for males and 18 for females.

- Girl children in rural areas are more affected than their urban counterparts.

- India is estimated to have over 24 million child brides; 40% of the world's 60 million child marriages take place in India according to the National Family Health Survey.

- India has the 14th highest rate of child marriage in the world, according to the International Centre for Research on Women.

- Marriage systems and practices vary by region, caste and tribe.

- Rates of child marriage are higher in the North-West and lower in the South-East of the country.

- The states with the highest rates of child marriage (50% and above) are Bihar, Rajasthan, Jharkhand, Uttar Pradesh, West Bengal, Madhya Pradesh, Andhra Pradesh and Karnataka.

- Rajasthan had emerged as the State with the highest incidence of child marriage both among boys, which was 8.6%, and girls, which was 8.3%, in the 2011 Census.

- According to the National Family Health Survey-4 data collected in 2015-16, 16.2% of the girls aged 15 to 19 years were married before the age of 18 in Rajasthan, with variations across districts.

- In Bihar, nearly 70% of women in their early twenties reported having been married by the age of 18.

- According to DLHS data, around 48% of married women in the 20-24 year age group got married before 18 in rural areas, compared with 29% in urban areas.

- Over the past fifteen years, child marriage has declined by just 11 percent – less than one percent per year.

Causes of child marriage:

- Gender inequality such as declining sex-ratio, sex-selective abortions
- Economic considerations such as leeway to large dowry
- Social norms
- Perceived low status of girls
- Poverty
- Lack of education
- Safety concerns about girl children
- Control over sexuality and chastity of a young bride
- Honour killings

Challenges:

- Child marriage is a violation of human rights and dignity.
- It negatively influences children's rights to education, health and protection. These consequences impact not just the girl directly, but also her family and community.
- This social evil propels an unending list of crimes against children, especially against our daughters. A child bride is more likely to experience domestic violence and become infected with HIV/AIDS.

- Child marriage negatively affects the Indian economy and can lead to an intergenerational cycle of poverty. Girls and boys married as children more likely lack the skills, knowledge and job prospects needed to lift their families out of poverty and contribute to their country's social and economic growth.
- Lack of feminist law making and policy-making, and two, the lack of implementation of extant legal provisions and policies.
- Rural poverty implies lack of economic benefits emanating from educating their girls since they will leave their house after marriage.
- Low levels of literacy implies people do not indulge in family planning for there is a notion that more children are more hands to work.
- Cultural practices perceive unmarried women as liabilities for family integrity and honour.

Legislative Framework:

- The Child Marriage Restraint Act, 1929 or Sarda Act fixed the age of marriage for girls at 14 years and boys at 18 years.
- Pre-Conception and Pre-Natal Diagnostic Techniques Act (1994) to prohibit prenatal diagnostic techniques for determination of the sex of the foetus leading to female feticide.
- The Prohibition of Child Marriage Act, 2006
- Legal age for marriage in India is eighteen for girls and twenty-one for boy.
- Full-time "Child Marriage Prohibition Officers" are appointed in every state and are supposed to police instances of child marriage.
- Child marriage is punishable by imprisonment of up to two years, or may be charged with a fine of up to one lakh rupees, or both.
- By Section 10, these penalties are extended to anyone who performs, conducts, directs or abets a child marriage unless he can prove that he had reason to believe that the marriage was no child marriage.
- If the child herself contracts for a child marriage, under Section 11, any parent or guardian who actively supports the marriage or negligently fails to prevent it is punishable by way of imprisonment and or a fine.

Way forward:

- At the global level, child marriage is included in Goal 5 "Achieve gender equality and empower all women and girls".
- The Ministry of Women and Child Development supports a child help line service (Toll free number 1098) to reach out to children in distress.

Drug Addiction

In News: The death of two brothers due to drug addiction on the same day in Punjab's Amritsar and a viral video of drug abuse inside a jail where one of the brothers was lodged has put the focus back on the drug menace in the state.

- This is the second such case of brothers dying due to alleged drug addiction in the Majha region in the last two months

Understanding the situation:

- Globally, the prevalence of alcohol use disorders is significantly higher than the prevalence of drug use disorders.
- Generally, alcohol and drug use disorders are more common among males than among females.
- According to the World Health Organisation Report 2002 (WHO), 8.9% of the total burden of disease is due to use of psychoactive substances; tobacco accounted for 4.1%, alcohol 4%, and illicit drugs 0.8% of the burden of disease.
- There are 2 billion alcohol users, 1.3 billion smokers and 185 million drug users globally (WHO 2002).
- These three psychoactive substances have different disease burdens on different age groups.
- Illicit drug use causes mortality earliest in life, alcohol also mainly (65%) before the age of 60, while 70% of the tobacco deaths occur after the age of 60.
- The use of different substances varies in different WHO regions as in Europe and South-East Asia tobacco use is the largest burden while alcohol is the largest burden in Africa, the Americas, and Western Pacific.

- 155 to 250 million people, or 3.5% to 5.7% of the world's population aged 15-64 used other psychoactive substances, such as cannabis, amphetamines, cocaine, opioids, and non-prescribed psychoactive prescription medication (WHO-2008).
- Globally, cannabis is the most commonly used substance (129-190 million people), followed by amphetamine type stimulants, then cocaine and opioids.

Indian Context:

- In India, opioids are commonly used including heroin ('smack' / 'brown sugar') as well as pharmaceutical opioids (such as buprenorphine, pentazocine and dextro-propoxyphene).
- In the north-eastern region, heroin and dextropropoxyphene are the most commonly used opioids
- Impure heroin (smack), and buprenorphine are the most commonly used opioids in metropolitan cities such as Delhi, Mumbai, Chennai and Kolkata.
- Pentazocine is the most commonly injected opioid in Karnataka, Andhra Pradesh, Chhattisgarh.
- In the states of Punjab and Haryana, buprenorphine is commonly used by injectors.
- As per the HIV sentinel surveillance report, HIV prevalence among IDUs in India is 7.2%. However, some states have much higher HIV rates among IDUs such as HIV prevalence among IDUs is 21% in Punjab, 18% in Delhi and around 12% in Manipur and Mizoram.
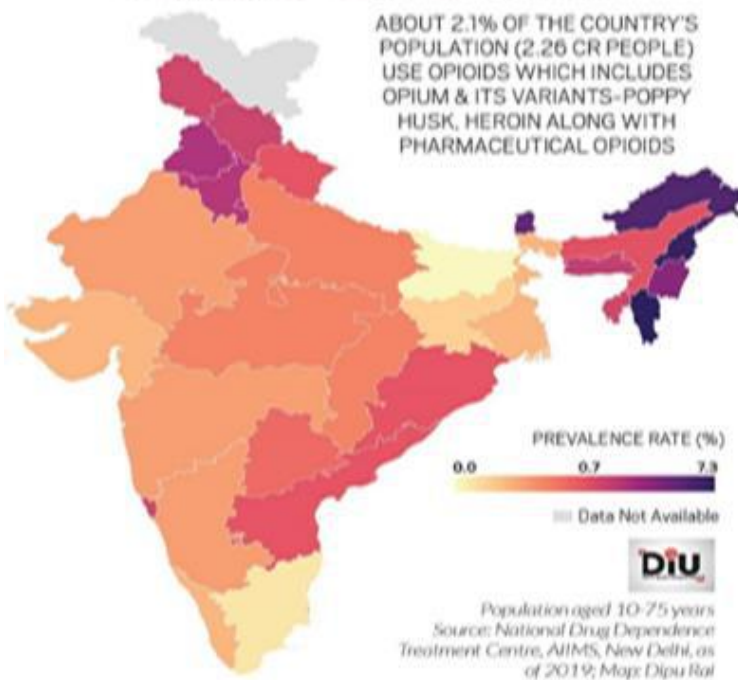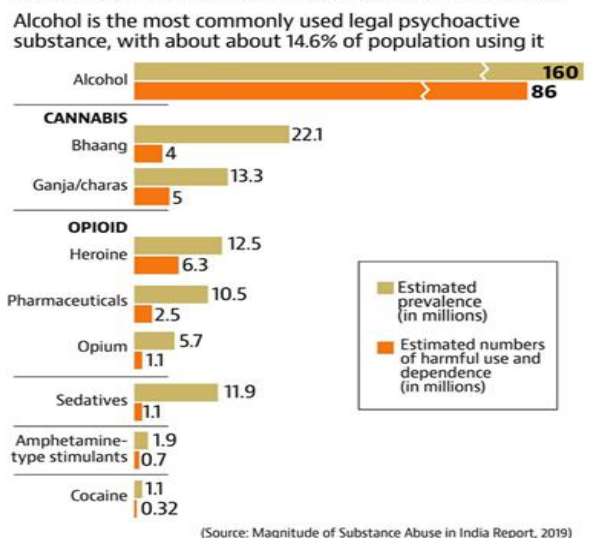
Causes:

- **Genetics & Family History** – Your genes may mean a greater predisposition to addiction. If your parents or their parents had a history with drug abuse, your chances of being addicted to drugs increase drastically.
- **Environmental Cause** – As environment influences behaviour, it can contribute to drug addiction
  - Abuse of drugs among friends and peers
  - Lack of social support
  - Troubled relationships
  - Stress in life
  - Low socioeconomic status

- **Psychological Cause** such as sexual or physical abuse, negligence from parents and peers, domestic violence, everything can lead to psychological stress. And people turn to drugs to let off this stress. Over time, this misuse of drugs can become an addiction.
- Other psychological causes
    - Mental disorder such as depression
    - Lack of friends in school or any social setting
    - Huge academic pressure
    - Traumatic events
    - Glorification in popular media like television series, films picturises it as a thrilling and seductive affair for youngsters who can be misguided easily because of their relative lack of experience in life.
    - Lack of knowledge of risk factors related to drug abuse.

Concerns:

- People who inject drugs (psychoactive drugs for non-medical purposes) are at increased risk of HIV, hepatitis B and hepatitis C.
- Around 13 million people inject drugs globally and 1.7 million of them are living with HIV; injecting drug users accounts for approximately 10% of HIV infections.
- The estimated global prevalence of hepatitis C in people who inject drugs is 67%.
- Psychoactive substance use by drivers has been associated with impaired driving and increased accidents risk.
- Health and social problems associated with use of and dependence on tobacco, alcohol and illicit substances can be prevented by greater awareness by individuals, families and societies to use appropriate public health actions.

Suggestions:

- **Knowledge and Education:** learning about the physical, biological, and social effects of drug misuse and evaluating the risk factors like losing a job, isolation from society, dropping out of college.
- **Developing a healthy lifestyle**: There is no better prevention of drug problems than adopting a healthy lifestyle. Being active and fit makes it easier to manage stress. This, in turn, helps to reduce the urge to use drugs or any other harmful substances to manage stress.
- **Behavioural Therapy**: is the standard treatment for drug addiction after detoxification. It can be done by one-on-one sessions, in a group, or family basis, depending on the requirements.
- **Learning healthy ways to cope with stress** – Stress is one of the primary reasons that drive people to drug misuse. In this fast-paced world, stress is inevitable. Healthy habits like exercising, volunteering for a good cause, etc. to increase a sense of fulfilment.
- **Developing close bonds with family:** A loving family works as a support system and helps you deal with your pressures in life.

Government initiatives:

- **Nasha Mukt Bharat: Annual Action Plan (2020-21):**
    - The Action Plan has the following components: Awareness generation programmes; Focus on Higher Educational institutions, University Campuses and Schools; Community outreach and identification of dependent population; Focus on Treatment facilities in Hospital settings; and Capacity Building Programmes for Service Providers.
- **National Action Plan for Drug Demand Reduction** for the period of 2018-25 prepared by The Ministry of Social Justice and empowerment
    - Preventive education
    - Awareness generation
    - Identification, counselling, treatment and rehabilitation of drug dependent persons
    - Training and capacity building of service providers through collaborative efforts of government and civil society

Way forward:

- Though the government has an over-encompassing blueprint, committed workforce and several dedicated programmes and policies at its disposal, there is a need to improve the current programmes (to address the unmet needs), to have a coordinated effort between Ministries, incurring uniformity at the policy level, to make scientifically informed choices and to strengthen the supply reduction chains.

About Heroine:

- Heroin is an opioid drug made from morphine, a natural substance taken from the seed pod of the various opium poppy plants grown in Southeast and Southwest Asia, Mexico, and Colombia.
- Heroin can be a white or brown powder, or a black sticky substance known as black tar heroin.
- People inject, sniff, snort, or smoke heroin. Some people mix heroin with crack cocaine, a practice called speed balling.
- Heroin enters the brain rapidly and binds to opioid receptors on cells located in many areas, especially those involved in feelings of pain and pleasure and in controlling heart rate, sleeping, and breathing.
- People who use heroin report feeling a "rush" (a surge of pleasure, or euphoria)
- However, there are other common effects, including: heavy feeling in the arms and legs, nausea and vomiting, clouded mental functioning and being unconscious.
- Long term effects may include liver and kidney diseases, infection of the heart lining and valves, abscesses, mental disorders such as depression, etc.

SOCIETY & SOCIAL ISSUES

Demographic changes in border areas and radicalisation in India

Context: Securing India's borders against anti-national interests and at the same time putting in place systems that can prohibit such elements while encouraging genuine trade and commerce are the principles of effective border management.

- While addressing the two-day National Security Strategies (NSS) Conference, Union Home Minister Amit Shah stressed checking the demographic change in border areas and growing radicalisation in border areas.
- He stressed that police forces of the border states should keep a watchful eye on this development, which is very serious in nature.

What are India's bordering countries?

India shares its borders with the following countries:

- Bangladesh 4096.70 km running along West Bengal, Assam, Meghalaya, Tripura and Mizoram.
- Pakistan has a border stretch of 3323 km running along Gujarat, Rajasthan, Punjab, Union Territory of Jammu & Kashmir and Union Territory of Ladakh.
- China has a 3488 km border running along Arunachal Pradesh, Sikkim, Uttarakhand, Himachal Pradesh and the Union Territory of Ladakh.
- Nepal has a 1751 km border running along Uttarakhand, Uttar Pradesh, Bihar, West Bengal and Sikkim.
- Bhutan has a 699 km border running along Sikkim, West Bengal, Assam and Arunachal Pradesh.
- Myanmar has a 1643 km border running along Arunachal Pradesh, Nagaland, Manipur and Mizoram.
- Afghanistan has a 106 km border running along the Union Territory of Ladakh but is presently under the illegal occupation of Pakistan

What is the problem of illegal migration in India?

- Presently, we are facing the threats of illegal migrants from Myanmar, Bangladesh, Pakistan, and other countries.
- In 2004, then Union Minister of State for Home told Parliament that the country had 1.2 crores of unlawful migrants. Presently, India is home to over two crore illegal migrants.
- Following are the factors which facilitate illegal migration.
- **Porous Borders:** India has a long and porous international border with Bangladesh, Nepal, Bhutan, Pakistan and Myanmar. The border passes through various natural and cultural landscapes.
- **Ethnicity:** The ethnic configuration of the people is similar on both sides of the borders, and it is quite challenging to discern between the Indian residents and others.
- **Fertile Land:** The flat and fertile land along the borders support dense human inhabitation along the border. There are many habitats situated right up to the borders.
- **Social network:** The social networks created between the old and new immigrants over decades are incredibly necessary for the movement of people stealthily across the border.
- **Political patronage**: Political parties have always utilized the susceptibility of the illegal migrants for their selfish interests and paybacks. For vote banks, the political parties sometimes protect the illegal migrants.

What is the impact of Illegal Migration in India?

- Such a massive influx of illegal migrants has grave consequences on the nation's socio-cultural, economic and political aspects.
- Frequent clashes due to lack of security: Illicit migration has caused periodic clashes between India's residents and migrants. This leads to their loss of life and property, thus violating their fundamental constitutional rights.

- Law and Order problem: The inimical elements undermine the rule of law and integrity of the country and indulge in illegal and anti-national activities, such as entering the country clandestinely, fraudulently acquiring identity cards, exercising voting rights in India and resorting to trans-border smuggling and other crimes.
- Political Instability: Fight for the ownership of limited resources, economic opportunities, and cultural dominance leads to conflict between the locals and migrants. Local political leaders exploit the conflict for their political games, thus creating a great divide among the people.
- Radicalisation and terrorism: Fight against terrorism in India is sometimes viewed as an attack on Muslims, which is not true. But the ill migrants use this news to radicalise certain vulnerable sections of the Muslim community staying in border areas. This is the significant impact of illegal migration.

What are demographic changes and radicalisation issues in border areas?

- Radicalisation can be defined as a road to terrorism, a trap of fundamentalism and extremism, and a path where violence is justified as a means to achieve the results.
- As per the reports of Uttar Pradesh and Assam police forces, there has been a 32% increase in the Muslim population in some border districts compared to the national average of 10-15%. They also reported that illegal camps comprising illegal migrants are cropping up in many border districts.
- The growth of illegal migrants is closely connected with national security, especially in the border areas. They bring religious, ethnic and linguistic conflicts leading to terrorism.
- Security agencies believe that demographic change is not just the increase in population but it could be a new design of infiltration in India.
- To plan and accomplish a terrorist attack, the terror organisations require foot soldiers, supporters & sympathisers, funds, arms and war-like stores, unrestricted mobility, and other logistics support to reach the targets. A radicalized section of society will enable such organisations to get these necessary support.
- Radicalisation process prepares the ideological, social, cultural, and religious basis for using terror as a weapon by these terrorist organisations. All the above factors need a fertile ground and a radicalized section of the society to provide that much-needed platform.
- Not only that, these areas are also witnessing an increase in radicalisation. Recently, five terror modules were busted in Assam.

What should be the way forward?

- The first step to counter-radicalisation is to diagnose the problem correctly and holistically and then build a counter-narrative.
- At the same time, ensuring adequate border security and management is essential for preventing and countering the flow of suspected people in the border areas.
- The problem of radicalisation and terrorism in India cannot be tackled without understanding the phenomenon of terrorism in South Asia. Therefore, our policy of counter radicalisation must co-ordinated as South-Asian efforts to address the challenges of radicalisation.
- Counter-radicalisation and de-radicalisation should form the fundamental pillars of the overall national security strategy.
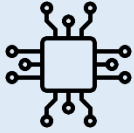
SCIENCE & TECHNOLOGY

Lithium-Ion Batteries

Context: The key aspects of safety and sustainability are posing impediments to the growth envisaged in lithium-ion battery (LIB) usage. In India, reports of fatality and material loss due to fire from LIBs are on the rise.

About Li ion batteries (LIB):

- Lithium-ion batteries use aqueous electrolyte solutions, where ions transfer to and fro between the anode (negative electrode generally made of graphite) and cathode (positive electrode made of lithium), triggering the recharge and discharge of electrons.

Features of LIB:

- Small size of the batteries
- light weight
- affordability
- the ability to sustain multiple charge cycles
- high energy density

Various impediments to the growth of LIB:

Safety issues with LIB:

- In India, reports of fatality and material loss due to fire from LIBs are on the rise due to defects in battery cells as well as in battery designs.

Concerns around sustainability and lifecycle management of LIBs:

- The challenge of the ever increasing demand for metals required for the batteries and the mines as the only primary mineral source.
- Environmentally sustainable solutions to deal with the mountains of garbage created by end-of-life batteries.

Challenge of Partial recovery of metals from recycling processes:

- Most recycling processes practice partial recovery wherein only high-margin metals are recovered from waste discarding the rest resulting in a loss of economic opportunity for the nations which continue to rely on high-cost imports.
- It also provides little economic incentive for other recyclers to recover low-margin metals from the discarded waste.

Ensuring sustainability and lifecycle management of LIBs:

- According to predictions, the volume of the end-of-life LIBs is likely to increase from 7,05,000 tonnes in 2025 to about 9 million tonnes by 2040.
- As the long-term sustainability of depending on primary mineral sources (mines) is in question, recycling is key.
- Unlike traditional practices, design of EVs is integrated with that of the battery and its components.
- The customisations on the battery end get more complex with new features like swappable battery options and connectivity requirements as in the case of autonomous cars.
- EVs therefore need an accelerated go-to-market approach to cater to the sustainability goals driven by organisations and nations across the world.

Government Measures to mitigate the environmental, social and financial impacts of LIB waste:

- The government has notified the Battery Waste Management Rules 2022 to manage a wide range of batteries that include LIBs.
- The mechanism of "Extended Producer Responsibility" (EPR) increases the accountability battery manufacturers need to assume towards collection, refurbishment/recycling of batteries.
- This move is expected to accelerate the development of infrastructure for waste collection and improve recycling rates from the mere 5-9 per cent, as it stands today.

Way Forward:

- A mandated minimum percentage of recycled material in all products will open doors for new technologies to be adopted.
- Thus, the need of the hour is to accelerate the development of circular economy solutions that recycle all the metals and facilitate a cradle-to-cradle (infinite loop) approach.
- The ultimate goal is to meet sustainability goals and deploy technologies/best practices that reduce dependency on primary ores and unless that is done, partial recovery of metals or export of black powder (crushed battery waste) for recovery will continue.
- A strong collaboration among technologists, policy-makers and governments is required to help manage the 'EV revolution 'and bridge the huge gap between technology readiness that addresses both sustainability and safety issues in LIBs.

PRACTICE QUESTIONS

Q.1) Consider the following Tiger Reserves (TR) in India:

1. Bandipur TR
2. Dudhwa TR
3. Rajaji TR
4. Pilibhit TR

Which of the above-mentioned TR are located in Uttar Pradesh?

a. 1 and 2 only
b. 2 and 4 only
c. 3 and 4 only
d. 1 and 3 only

Q.2) Consider the following pairs:

Textile	State/UT
1. Himroo fabric	Madhya Pradesh
2. Thigma/Wool tie	Ladakh
3. Chamba Rumal	Himachal Pradesh
4. Mashru weaves	Gujarat

How many given pairs above is/are correctly matched?

a. One pair only
b. Two pairs only
c. Three pairs only
d. All four pairs

Q.3) Which among the following organizations releases the "Global Innovation Index"?

a. World Intellectual Property Organization
b. World Economic Forum
c. World Bank
d. Food and Agricultural Organization

Q.4) Which of the following statements is not true with respect to NDMA?

a. It is a statutory body.
b. Prime Minister of India is the Chairperson of the NDMA.
c. Nine other members of the NDMA are nominated by the chairperson.
d. The Minister of State for Home Affairs acts as the Vice-Chairperson of NDMA.

Q.5) Consider the following statements regarding Nord Stream Gas Pipeline?

1. It passes through the Caspian Sea.
2. It runs between Russia and Germany

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.6) With reference to modern Indian history, consider the following events:

1. Kheda Movement
2. Ahmedabad Mill Strike
3. Quit India Movement
4. First Round Table Conference

In which of the above mentioned events did Mahatma Gandhi participate?

a. 1 2 and 3 only
b. 2 3 and 4 only
c. 1 2 and 4 only
d. 1 2 and 4 only

Q.7) What is/are the advantages/advantages of implementing the 'Telecom Technology Development Fund' scheme?

1. The scheme entails grants to Indian entities to encourage and induct indigenous technologies to meet domestic needs.
2. Help in creation of intellectual property.

Select the correct answer using the code given below:

a. 1 only
b. 2 only
c. Both 1 and 2
d. Neither1 nor 2

Q.8) With reference to the "AUKUS alliance", consider the following statements:

1. It is a treaty to secure economic cooperation between Australia, the United Kingdom, and the United States.
2. It follows the IAEA safeguards.

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.9) Consider the following statements regarding Denisovans

1. They are an extinct species of archaic humans who lived in Africa around 20,000 years ago.
2. There is abundant fossil remains that point to the existence of Denisovans.
3. Denisovan version of a gene called EPAS1 is found to confer a survival advantage at

high altitude and is common among present-day Tibetans.

Which of the above statement(s) is/are correct?

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

Q.10) With reference to Koalas, consider the following statements:

1. Koalas are endemic to Australia and rely on the palm tree for both habitat and food.
2. They sleep for 18-22 hours because they get very little energy from their diet.
3. In India, Koalas are found near Odisha coast.

Which of the statements given above is/are correct?

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

Q.11) Shyamji Krishna Varma was

1. responsible for starting the Home Rule Movement.
2. the founder of The Indian Sociologist.
3. first President of Bombay Arya Samaj.

Select the correct statement/statements using the codes given below.

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

Q.12) Which of the following organization releases the Global Gender Gap Report ?

a. World Economic Forum
b. UN Women
c. World Bank
d. Ministry of Women and Child Development

Q.13) With reference to 'herSTART' scheme, consider the following statements:

1. It is the flagship scheme of the Ministry of Commerce and Industry.
2. It includes a digital platform to provide resources and training modules free of cost to aspiring women entrepreneurs.
3. It has been recognised by the Department for Promotion of Industry and Internal Trade (DPIIT) as a key driving initiative in the States Startup Rankings Framework Report of 2022.

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.14) The term 'Decade for Action' is sometimes seen in the news in the context of:

a. Online content regulations made by the European Union to moderate user content
b. plan of action outlined by the countries of the world to digitize start-ups
c. pledges taken by the countries to combat oil spills and marine pollution
d. plan of action outlined by the countries of the world regarding Sustainable Development Goal

Q.15) Consider the following statements regarding Chola Dynasty:

1. The Airavateswara temple at Darasuram near Thanjavur was built during the reign of Rajaraja II.
2. Chola period bronzes were created using the lost wax technique.
3. The dynasty was founded by king Vijaylaya

Which of the statements given above is/are correct?

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

Q.16) Consider the following statements regarding Corporate Social Responsibility (CSR):

1. CSR in India is based on the Gandhian concept of Trusteeship.
2. India is the first country to mandate and quantify CSR expenditure.
3. Indian Companies are now required to spend, in every financial year, at least 2% of their average net profits generated during the 3 immediately preceding financial years.

Which of the above statement(s) is/are correct ?

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

Q.17) Consider the following statements regarding Quality Council of India (QCI):

1. QCI is a non-profit organization registered under the Societies Registration Act of 1860.
2. The Ministry of Finance is designated as the nodal ministry to look after QCI.
3. QCI has been established to create a mechanism for independent third party

assessment of products, services and processes.

Which of the above statements are correct?

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

Q.18) The term 'moonlighting' often mentioned in news is related to

a. Having a second or side job
b. Light emitting from the moon during night time
c. Exposing a scandal
d. Preserving nocturnal wildlife

Q.19) With reference to Super Apps, consider the following statements.

1. They enable access to a suite of services over a single digital platform.
2. It is accessed and controlled through various personal accounts.
3. Indonesia has recently launched its first Super App, called WeChat.

Which of the statements given above are correct?

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

Q.20) With reference to Indian agriculture, consider the following states:

1. Andhra Pradesh
2. Gujarat
3. Maharashtra
4. Telangana

How many of the above are generally known as Cotton Producing States?

a. One state only
b. Two states only
c. Three states only
d. All four states

Q.21) The Nobel Prize for Physiology 2022 has been awarded to Svante Pääbo for his pioneering work in the field of

a. Palaeontology
b. Palaeogenomics
c. Biostratigraphy
d. Bioluminescence

Q.22) With reference to Indian cultural history, consider the following statements:

1. Sun Temple at Modhera was built during the reign of Bhima I of the Solanki dynasty.
2. The temple is suspected to have been built to commemorate the defense of Modhera by Bhima I against Mahmud of Ghazni.
3. The temple complex is built in Maru-Gurjara style.

Which of the above statements are correct?

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

Q.23) Consider the following statements:

1. The Information Technology Rules (IT Rules), 2021 replaced the Information Technology Act, 2000.
2. The IT Rules 2021 are the primary legislation for blocking websites.

Which of the above statements are correct?

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

Q.24) National Tiger Conservation Authority (NTCA) has been constituted under which act

a. Environment Protection Act, 1986
b. Biological Diversity Act, 2002
c. Wildlife Protection Act, 1972
d. Forest Conservation Act, 1980

Q.25) Consider the following statements:

1. Tele-MANAS is an online auction portal to allocate spectrum for 5G services in India.
2. Tele-MANAS is under the charge of the Department of Telecommunication.

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.26) The term 'ASAT' is talked about in the context of

a. India's own satellite navigation system
b. Communication satellites
c. Deployment of a kinetic kill vehicle
d. Development of an astronomical observatory

Q.27) Consider the following metallic minerals:

1. Lanthanum (La)
2. Promethium (Pm)
3. Gadolinium (Gd)

Which of the above minerals are rare earth metals?

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

Q.28) The term 'header bidding' is used in the context of which of the following:

a. Online news dissemination
b. Market-related auction of dated securities
c. 5G spectrum allocation
d. Captive coal mining

Q.29) Consider the following statements:

1. 'Right to information' is a fundamental right.
2. Under RTI Act, requests for information must be replied within 60 days.
3. In case of matters involving a petitioner's life and liberty, the information has to be provided within 48 hours.

Which of the statements given above is/are correct:

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

Q.30) With reference to India's biodiversity, consider the following statements:

1. India's first Slender Loris sanctuary was recently notified by the Kerala government in the Nilgiri hills in the state.
2. The species acts as a biological predator of pests in agricultural crops and benefits farmers.
3. Its IUCN red list status is Critically Endangered (CR).

Which of the statements given above is/are correct?

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

Q.31) With reference to New Generation Launch Vehicle (NGLV) technology, which of the following statements are correct?

1. NGLV uses a cryogenic upper stage like GSLV Mk-III
2. NGLC is a reusable technology.
3. NGLC will be used for the 2023 lunar mission Chandrayaan-3

Select the correct answer using the code given below:

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

Q.32) If one wants to see snow leopards in their natural habitat, which one of the following is the best place to visit?

a. Khangchendzonga National Park
b. Namdapha National Park
c. Hemis National Park
d. Manas National Park

Q.33) The 97th Constitutional Amendment Act 2011 made changes to which of the following parts of the Constitution?

1. Part III
2. Part IV
3. Part IX A

Select correct answer code given below:

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

Q.34) Consider the following statements about Global Hunger Index – 2022

1. It is an annual report jointly published by Concern Worldwide and Welthungerhilfe.
2. It is calculated on the basis of three indicators – child wasting, child stunting and child mortality.
3. India ranked 107 out of 121 countries on the Global Hunger Index, 2022.

Choose the correct statements:

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

Q.35) Consider the following statements about Conference on Interaction and Confidence Building Measures in Asia (CICA)

1. It is a multi-national forum for enhancing cooperation towards promoting peace, security and stability in Asia.
2. To be a member of CICA, a state must have at least a part of its territory in Asia.
3. India is a founding member of CICA.

Choose the **incorrect** statements:

a. 3 only
b. 2 only
c. 2 and 3
d. None

Q.36) DART mission, recently seen in news is an initiative of?

a. National Aeronautics and Space Administration
b. Indian Space Research Organisation
c. Japan Aerospace Exploration Agency
d. European Space Agency

Q.37) Consider the following statements about:

1. Digital Banking Units (DBUs) includes rural banks, payment banks and local area banks

2. Neo banks offer digital banking services in partnership with NBFCs.

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.38) With reference to 'Quantum Computing', which of the following is/are correct?

1. It uses ones and zeroes to store information.
2. It is based on entanglement and superposition.
3. It can be used to send sensitive information through encryption.

Select the correct answer using the codes given below.

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

Q.39) The terms 'Jupiter, Fi Money, Niyo,' sometimes mentioned in the news recently are related to

a. Digital Banking Units
b. Cryptocurrency
c. Cyber attacks
d. Neo banks

Q.40) The terms ' WASP-76b and WASP-121b' sometimes mentioned in the news recently are related to

a. Exoplanets
b. Black Holes
c. Mini satellites
d. Magnetars

Q.41) With reference to Indian Bison, consider the following statements:

1. It is endemic only to India.
2. More than 80% of its population is present in India.
3. It is categorized as 'Endangered' species in IUCN's Red List.

Which of the statements given above is/are correct?

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

Q.42) Consider the following statements regarding Deposit Insurance and Credit Guarantee Corporation (DICGC):

1. It is a wholly-owned arm of the Reserve Bank of India (RBI), which offers deposit insurance.
2. It insures deposit accounts, such as savings, current, recurring, and fixed deposits up to a limit of Rs 10 lakh per account holder of a bank.
3. The Corporation maintains Deposit Insurance Fund, Credit Guarantee Fund and General Fund.

Which of the above statements is/are correct?

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

Q.43) Consider the following pairs:

Toxic metal   Their effects

1. Lead :   respiratory tract irritation

2. Sodium :   impact the nervous system
3. Cadmium :   anaemia and kidney damage
4. Nitrate :   mental impairment

Which of the pairs given above is / are correctly matched?

a. One pair only
b. Two pairs only
c. Three pairs only
d. All four pairs

Q.44) The term 'Commodity Fetishism' seen in the news refers to

a. Theory of capitalism that affects social relationships of labour
b. Theory of free-market capitalism by means of an invisible hand
c. Theory of diminishing marginal rate of substitution of commodity
d. Theory of economic relationship between income and demand for inferior goods.

Q.45) Consider the following statements, with respect to Global Hunger Index (GHI):

1. It is published by Food and Agricultural Organization annually.
2. A low score in the index reflects higher ranking of a country and implies a better performance.
3. India's rank has significantly improved during the last five years in the GHI.

Which of the statements given above is/are correct?

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

Q.46) With reference to Indian Biodiversity, Siamspinops garoensis, Afraflacilla miajlarensis and Philoponella rostralis are

a. Butterfly species
b. Snake species
c. Spider species
d. Frog species

Q.47) Consider the following:

1. It is the only port-town of the Indus Valley Civilisation.
2. It is a UNESCO World Heritage Site.
3. It has both upper and a lower town.

Which of the above is/are the feature/ features of Lothal site?

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

Q.48) Which of the following schemes have specific components for the welfare of women farmers:

1. Mahila Kisan Sashaktikaran Pariyojana (MKSP)
2. National Mission on Oilseed & Oil Palm,
3. National Mission on Sustainable Agriculture,
4. Sub-Mission for Seed and Planting Material

Select the correct answer using the code given below:

a. 1 2 and 4 only
b. 1 3 and 4 only
c. 2 3 and 4 only
d. All of the above

Q.49) Consider the following statements regarding particulate matter(PM):

1. PM10 is more harmful compared to PM2.5
2. PM2.5 is generally 2.5 millimeters of diameter or smaller.
3. PM 2.5 can cause human non-accidental death.

Which of the above are correct?

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

Q.50) With respect to Swadesh Darshan 2.0 (SD2.0), consider the following statements:

1. It is a centrally sponsored scheme.
2. Some of the prominent places identified are Jhansi and Prayagraj in Uttar Pradesh, Gwalior, Chitrakoot and Khajuraho in Madhya Pradesh and Ajanta and Ellora in Maharashtra.

Which of the above are correct?

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

Q.51) According to the Indus River water treaty, which of the following tributaries of Indus River allocated to India for unrestricted usage?

1. Chenab
2. Ravi
3. Jhelum
4. Sutlej

Select the correct answer using the code given below:

a. 1 and 3 only
b. 2 and 3 only
c. 2 and 4 only
d. 1 and 4 only

Q.52) **Consider the following statements regarding Swadesh Darshan Scheme:**

1. It is a centrally sponsored scheme being jointly implemented by the Union Ministry of Culture and equivalent departments of state governments.
2. The first phase of the 'Swadesh Darshan 2' will be started from January 2023 under which 15 states with two or three destinations each have been identified to be developed.
3. Under the scheme, the central government provides Central Financial Assistance (CFA) to State Governments/UT administrations for infrastructure development of different 'thematic tourist circuits' identified in the scheme.

Which of the above statements is/are correct?

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

Q.53) Recently, DefExpo 2022 was held in which city of India

a. Delhi
b. Hyderabad
c. Mumbai
d. Bengaluru

Q.54) United Nations Security Council Resolution 1267, is often mentioned in news is related to

a. Sanctions on North Korea
b. Israel – Palestine Issue
c. Recognizing the terrorist as global terrorist
d. Sanctions against Syria for using chemical weapon

Q.55) Which one of the following is not a Harappan site?

a. Lothal
b. Kalibangan
c. Sanchi
d. Rakhigarhi

Q.56) With respect to Lake Hazen, consider the following statements:

1. It is located in Greenland.
2. It is the largest High-Arctic Lake in the world.
3. It is a saltwater lake.

Which of the above are correct?

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

Q.57) In context of 'Scorched-Earth' tactics, which of the following statements is correct:

a. cyber-attacks tactics to breach information
b. weapons to incapacitate enemy satellites
c. electrostatic separation of rare earth metals
d. bombing of energy infrastructure

Q.58) Consider the following statements:

1. An eclipse happens when a planet or a moon gets in the way of the sun's light.
2. A Solar Eclipse occurs when the moon comes in between the sun and the earth.
3. A lunar eclipse occurs when the Earth moves into the Moon's shadow.

Which of the statements given above are true?

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

Q.59) With respect to OneWeb, consider the following statements:

1. It is a joint venture between NewSpace India Limited (NSIL) and UK government.
2. It recently launched 36 satellites with LVM3 rockets.
3. The LVM3 was conceived primarily for launching geo-stationary satellites.

Which of the above are correct?

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

Q.60) Consider the following statements regarding Cellular Operators Association of India (COAI) :

1. COAI has played a major role in the setting up and operations of the Telecom Sector Skill Council (TSSC) in India under the aegis of the National Skills Development Corporation (NSDC).
2. COAI was instrumental in the formation of the Telecommunications Standards Development Society, India (TSDSI).
3. COAI played a major role in setting up the Telecom Centres of Excellence (TCOE) set up in Public Private Partnership (PPP) mode across the country.

Which of the following statements are correct?

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

Q.61) With reference to the HAWK missile system, which of the following statement(s) is/are correct?

1. It is a Russian shoulder-fired anti-aircraft system.

2. It has a kill probability of 100%.

Select the correct answer using the codes given below.

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

Q.62) The species called Allmania multiflora are discovered recently related to

a. Critically endangered snake species
b. Critically endangered herb species
c. Alien plant species
d. Native plant species

Q.63) Which of the schemes launched by Indian Government towards Nationally Determined Contributions to reduce carbon footprint:

1. National Solar Mission
2. National Mission for Enhanced Energy Efficiency
3. National Mission on Sustainable Habitat

Select the correct answer code using the code given below:

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

Q.64) Consider the following statements regarding Oslo Accords:

1. The Oslo Accords are a series of agreements aimed at achieving a comprehensive peace treaty between Israel and the Palestine Liberation Organization (PLO).
2. The agreement directly addresses the key "permanent status" issues of water, refugees, Jerusalem, settlements and borders.

Which of the above is/are correct?

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

Q.65) With reference to Blue Flag certification, consider the following statement(s):

1. It is given by United Nations Environment Programme (UNEP), United Nations World Tourism Organisation (UNWTO), and International Union for the Conservation of Nature (IUCN).
2. India has 15 blue flag beaches.
3. Eden beach of Puducherry received the certification in 2022.

Select the correct answer using the codes given below.

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

Q.66) ' The coldest year of the rest of their lives Report' is prepared by the

a. United Nations Framework Convention on Climate Change (UNFCCC)
b. United Nations International Children's Emergency Fund (UNICEF)
c. Save the Children foundation
d. World Meteorological Organization (WMO)

Q.67) Consider the following statements regarding Mangarh Dham and Bhils:

1. Ghoomar is a traditional folk dance of the Bhil tribe
2. As of 2013, they were the largest tribal group in India with the majority living in

the states of Gujarat, Madhya Pradesh, Rajasthan and Chhattisgarh

3. Mangarh Dham is known for the massacre of tribals including bhils that took place six years before Jallianwalla Bagh and is sometimes referred to as the "Adivasi Jallianwala".

Which of the 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) The Tigray conflict region is often mentioned in news is related to

a. Ukraine
b. Egypt
c. Ethiopia
d. Mexico

Q.69) With reference to cultural history of India, consider the following statements:

1. The Kushans were instrumental in developing Gandhara and Mathura schools of art.
2. Vima Kadphises introduced the first silver coins of India.
3. The Western Kshatrapa coins are reckoned to be the earliest coins bearing dates.
4. The Vijayanagara coins continued in circulation even after the kingdom was snuffed out in 1565.

Which of the statements given above are correct?

a. 1 3 and 4 only
b. 1 2 and 4 only
c. 2 and 3 only
d. 1 and 4 only

Q.70) Regarding "Machchu river", consider the following statements

1. It originates from Lushai Hills in Mizoram
2. Julto Pool bridge is located on the river.

Which of the following statements are correct:

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

Q.71) With reference to Pradhan Mantri Mudra Yojana, consider the following statements:

1. It is the flagship scheme of the Ministry of Labour and Employment.
2. It provides loans upto 10 lakh to the non-corporate, non-farm small/micro enterprises.
3. More than 60% of PMMY accounts are held by women entrepreneurs.

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.72) In the context of Salmonellosis disease, consider the following statements:

1. Salmonellosis is an infection with a virus called Salmonella.
2. It is a Zoonotic disease.
3. Salmonella live in the intestinal tracts of animals, including birds.

Which of the above is/are correct?

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

KEY ANSWERS

1	b	11	b	21	b	31	c	41	b	51	c	61	d	71	c
2	c	12	a	22	a	32	c	42	c	52	b	62	b	72	d
3	a	13	c	23	d	33	a	43	b	53	d	63	a		
4	d	14	d	24	c	34	b	44	a	54	c	64	a		
5	b	15	a	25	d	35	d	45	c	55	c	65	c		
6	a	16	d	26	c	36	a	46	c	56	b	66	b		
7	c	17	b	27	a	37	b	47	b	57	d	67	d		
8	b	18	a	28	a	38	a	48	d	58	a	68	c		
9	a	19	a	29	c	39	d	49	d	59	c	69	a		
10	c	20	d	30	b	40	a	50	b	60	d	70	b		