

THE IAS GAZETTE

A House Journal of **APTI PLUS**

SEPTEMBER 2022



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ND EDITION

**DECLINING
MANGROVES
COVER**

**CRIMINAL
PROCEDURE
(IDENTIFICATION)
ACT 2022**

**WOMEN
SCIENTISTS
IN INDIA**

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A MONTHLY PERIODICAL FOR ASPIRANTS OF UPSC EXAMINATION



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IASGYAN
PREDICT THE UNPREDICTABLE

GENERAL STUDIES - I

MOHENJO-DARO

GS-I CULTURE & HERITAGE

Context

- The recent spell of heavy rains and floods that ravaged large parts of Pakistan's Sindh province has also taken a heavy toll on the archaeological site of Mohenjo-daro.

Details

- In fact, the calamity has pushed the archaeological site – situated on the bank of the Indus river – to the “brink of extinction”.
- Pakistan's Department of Archaeology has said that **Mohenjo-daro might be removed from the world heritage list, if urgent attention towards its conservation and restoration is not given. Consequently, the administration has banned the entry of tourists to the place.**

Importance of Mohenjo-daro

- Mohenjo-daro, a group of mounds and ruins, is a 5000-year-old archaeological site** located about 80-km off the city of Sukkur.
- It comprises the remnants of one of two main centres of the ancient Indus Valley Civilisation, the other one being Harappa, located 640 km to the northwest, in Punjab province.**
- Mohenjo-daro, which means ‘mound of the dead’, was one of the oldest cities of the world.
- It is located in Sindh, Pakistan, next to the Indus River.
- Here the **Great Bath, uniform buildings and weights, hidden drains** and other hallmarks of the civilization were discovered in the 1920's.
- At Mohenjo-Daro **the most unicorn seals** have been found.
- The Mohenjo-Daro also has **two mounds**. The western mound is lower which was a citadel with 200 m X 400 m and eastern is a bigger which was having the relics of a buried city of size 400×800 meters.
- Mohenjo-Daro was the **largest city of the Indus valley civilization. Both Harappa and Mohenjo-Daro can be called the capital cities of the civilization.**
- A **granary has been found** which the largest building of the Mohenjo-Daro is.
- A **square pillared hall** is another important building found at Mohenjo-Daro. The scholars agree that this pillared hall was a site for social gatherings.
- All houses have a courtyard, kitchen and a well. All houses at Mohenjo-Daro have proper arrangements of light air and drainage.
- Mohenjo-Daro has shown an **extensive usage of bricks**.
- A **piece of woven cotton** along with spindle whorls and needles has been found.
- A **bronze figurine of a dancing girl** has been found.
- Mohenjo-Daro has also given evidence of violence leading to death.
- A **seal representing the Mother Goddess a plant growing from her womb** has been found.
- A **figurine of a bearded man** has been found at Mohenjo-Daro
- A **seal with a picture suggesting Pashupati Mahadev** has been found at Mohenjo-Daro.
- A seal which shows a woman to be sacrificed by a man with a knife in hand has been found at Mohenjo-Daro.
- Known to be a model planned city of the ancient civilisation, the houses here had bathrooms, toilets and drainage system.**
- The sheer size of the city, and its provision of public buildings and facilities, suggests a high level of social organisation.
- Though in ruins, the walls and brick pavements in the streets are still in a preserved condition.
- The ruins of the city remained undocumented for around 3,700 years, until 1920, when archaeologist RD Banerji visited the site.** Its excavation started in 1921 and continued in phases till 1964-65. The site went to Pakistan during Partition.

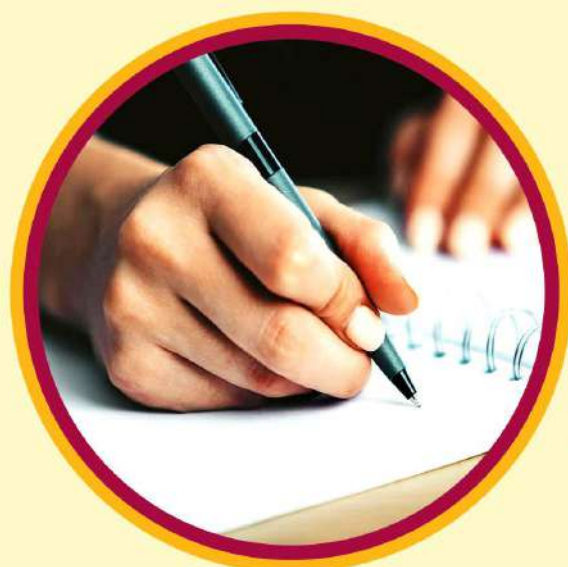
Other Indus Valley sites

- The Indus Valley Civilisation spanned much of what is now Pakistan and the northern states of India (Gujarat, Haryana and Rajasthan), even extending towards the Iranian border.
- Its major urban centres included Harappa and Mohenjo-daro in Pakistan, and Lothal, Kalibangan, Dholavira and Rakhigarhi in India.
- Mohenjo-daro is considered the most advanced city of its time, with sophisticated civil engineering and urban planning. When the Indus Valley Civilisation went into sudden decline around 19th century BC, Mohenjo-Daro was abandoned.

Losing world heritage tag

- There are around 1,100 UNESCO listed sites across its 167 member countries.

- Last year, the World Heritage Committee, holding its 44th session in China, decided to delete the property 'Liverpool - Maritime Mercantile City' (UK) from the World Heritage List, due to "the irreversible loss of attributes conveying the outstanding universal value of the property," a UNESCO statement said.
- Liverpool was added to the World Heritage List in 2004 in recognition of its role as one of the world's major trading centres in the 18th and 19th centuries - and its pioneering dock technology, transport systems and port management.
- Before that, the first venue to be delisted by the UNESCO panel was the Arabian Oryx Sanctuary in Oman, in 2007, after concerns over poaching and habitat degradation.
- Another site to be removed from the World Heritage list in 2009 was Elbe Valley in Dresden, Germany, after the construction of the Waldschloesschen road bridge across the Elbe river.



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FORMATION OF CONTINENTS

GS-I GEOGRAPHY

Context

- Earth's continents were formed by massive meteorite impacts that were prevalent during the first billion years of our planet's four and a half billion-year history, according to a new study.

Background

- The theory that giant meteorite impacts formed continents had been around for decades, but until now, there was little solid evidence for its support. The new study provides some concrete evidence supporting the big impact theory.

The new study

- Meteorite impacts generated massive energy to form oceanic plates, which later evolved into continents. The giant meteorite hit Earth and melted the outer shell of the Earth or the lithosphere, according to the study. This impact released the pressure on the underlying mantle. As a result, the mantle likely melted, creating an oceanic plateau.

Supporting Evidence

- The researchers looked for evidence in zircon crystals embedded in rocks from the Pilbara Craton in Western Australia. This craton is the remnant of an ancient crust that began forming more than three billion years ago.
- Zircons are formed by the crystallization of magma or are found in metamorphic rocks. They act as tiny time capsules, recording the period of geologic activity. Newer zircon adds to the original crystal as time progresses.
- Researchers studied the variants or isotopes of oxygen within these crystals: oxygen-18 and oxygen-16. The ratio between the two variants helped scientists estimate past temperatures. Older grains of zircon possessed the lighter oxygen-16. The younger ones contained the heavier oxygen-18. This pattern suggests the Pilbara Craton began with extensive melting of shallow, near-surface rocks, with subsequent melting occurring at successively deeper levels. If the oceanic plateau gets big enough, it can melt at its base to form granite, which is what the continents are made of. Granite requires both water and energy to form.

Significance of the new findings

- Understanding the formation and evolution of continents is important as it is the key to reserves of metals such as lithium, tin and nickel, which are required to develop batteries.

INDIAN OCEAN DIPOLE (IOD)

GS-I GEOGRAPHY

Context

- Australia is witnessing a second cold blast after its coldest July in a decade. The continent, which is in the throes of the southern winter, could also be in for a wet spring after meteorological authorities confirmed that a negative Indian Ocean Dipole (IOD) was underway.

Indian Ocean Dipole (IOD)

- The Indian Ocean Dipole (IOD) is defined by the difference in sea surface temperature between two areas (or poles, hence a dipole) – a western pole in the Arabian Sea (western Indian Ocean) and an eastern pole in the eastern Indian Ocean south of Indonesia.
- The IOD affects the climate of Australia and other countries that surround the Indian Ocean Basin, and is a significant contributor to rainfall variability in this region.
- In scientific terms, the IOD is a coupled ocean and atmosphere phenomenon, similar to ENSO but in the equatorial Indian Ocean.
- The IOD is defined by the Dipole Mode Index (DMI), which is a measure of the anomalous sea surface temperature (SST) gradient between the western equatorial Indian Ocean (50E-70E and 10S-10N) and the southeastern equatorial Indian Ocean (90E-110E and 10S-0N). Changes in SSTs on either side of the Indian Ocean (the dipole) drive convection and alter the Walker Cell circulation.

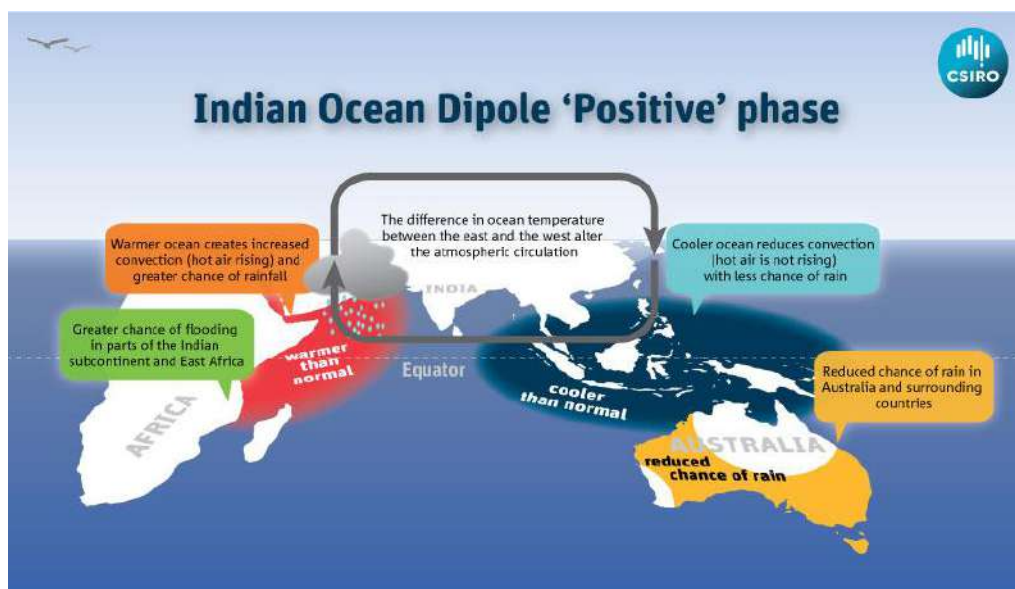
The Indian Ocean Dipole Events

Positive event

- The positive phase of the IOD is driven by warmer than normal SSTs off the coast of Africa and cooler than normal SSTs to the west of Indonesia. This configuration of surface sea temperatures reverses the normal circulation with easterly winds setting up across the equatorial Pacific.

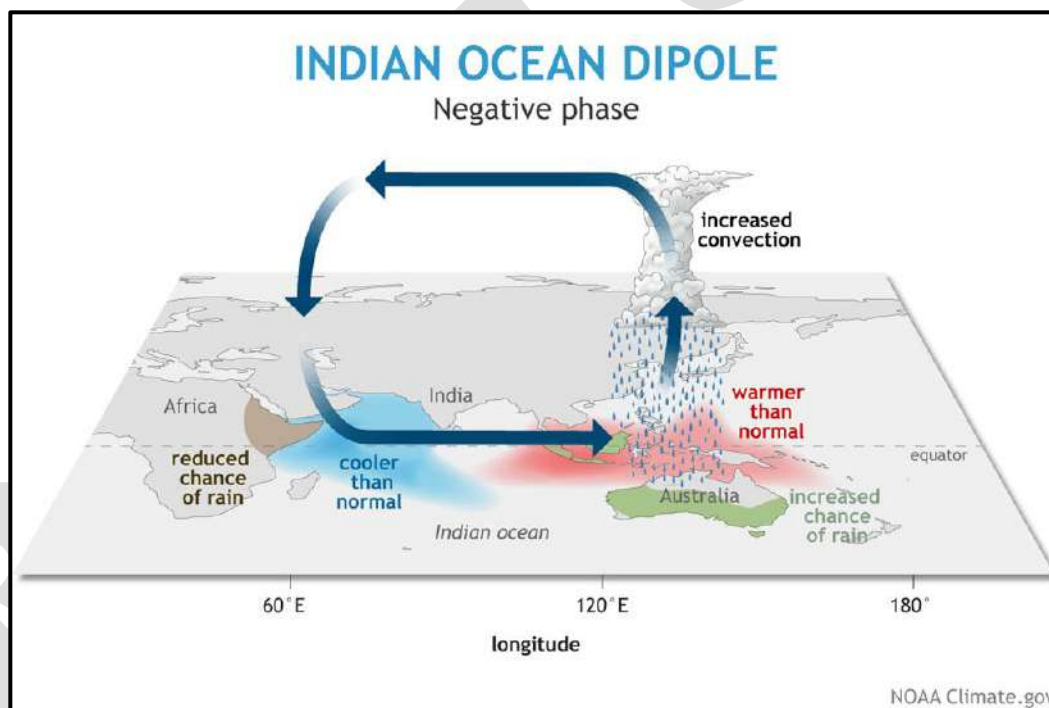
- The reversed circulation suppresses convection over Indonesia, and leads to predominately dry weather and potential for drought. Over the Horn of Africa, convection is enhanced and rainfall is much more abundant than usual. This pattern is consistent with El Niño (positive phase of ENSO). In a nutshell-

- Warmer sea surface temperatures in the western Indian Ocean relative to the east.
- Easterly wind anomalies across the Indian Ocean and less cloudiness to Australia's northwest.
- Less rainfall over southern Australia and the Top end.



Negative event

- The negative phase of the IOD is driven by cooler than normal SSTs off the coast of Africa and warmer than normal SSTs to the west of Indonesia. This configuration of surface sea temperatures gives the normal circulation a boost.
- The stronger circulation brings more consistent westerly winds over the ocean, stronger convection over Indonesia, and often drought conditions for the Horn of Africa. This pattern is consistent with La Niña (negative phase of ENSO). In a nutshell-



- Cooler sea surface temperatures in the western Indian Ocean relative to the east.
- Winds become more westerly, bringing increased cloudiness to Australia's northwest.
- More rainfall in the Top End and southern Australia.

Final Thoughts

- Phases of the Indian Ocean Dipole often persist for many months and are generally well predicted by dynamical modelling.
- The Indian Ocean Dipole is therefore a vitally important consideration in seasonal forecasting over both the tropics, and the mid-latitudes.

CLOUSBURSTS AND FLASH FLOODS

GS-I GEOGRAPHY

Context

- Many people got killed in destruction caused by cloudbursts and flash floods in different parts of Himachal Pradesh and Uttarakhand.

What is cloudburst?

- A cloudburst is an extreme downpour in a short period of time. It may be accompanied with hail and thunder. According to the Indian Meteorological Department (IMD), an unexpected precipitation exceeding 100mm (or 10 cm) per hour over a geographical region of approximately 20 to 30 square km is a cloudburst.

Is a cloudburst different from rainfall?

- Rain is condensed water falling from a cloud which may or may not be intense, however a cloudburst in a sudden heavy downpour.
- Only Rain which is over 100mm per hour is categorized as a cloudburst. It is very difficult to predict the cloudbursts due to its very small scale in space and time. To monitor the cloudburst, one needs dense radar network over the cloudburst-prone areas or a very high resolution weather forecasting models to resolve the scale of cloudburst.

How and where does a cloudburst occur?

- Cloudbursts do occur at plains; however, mountainous regions are more prone to cloudbursts due to orography (the geographical features of a mountain). A cloudburst occurs when warm air current from the ground or below the clouds rushes up and carries the falling raindrops up with it. As a result, new raindrops that are formed are heavier and denser. After a point, the raindrops become too heavy for the cloud and it falls down together in a short period over a small area, causing a cloudburst.

What are some of the worst cloudbursts in India?

- Great Musi flood, 1908: On 26 September, 1908, Hyderabad's surrounding areas witnessed a cloudburst. It was caused due to a cyclone in the Bay of Bengal. The city had recorded 153.2 mm rainfall on 27 September, 1908.
- Mumbai cloudburst, 2005: In 2005, Mumbai received an astonishing 944 mm of rain in just 24 hours. It led to a big chaos in the city.
- Uttarakhand cloudburst, 2013: In 2013, Uttarakhand's Kedarnath received unprecedented heavy rainfall between 14 and 17 June. The estimated toll was around 10,000, with over 3,000 persons missing, as per the state government.

What Is a Flood?

- A flood is an overflow of water onto normally dry land. Flooding can stem from many places, like existing waterways. Rivers and streams can cause flooding in surrounding areas, and floods occur over a long period of time, ranging from days to weeks.

Flash Floods

- Flash floods are caused when rainfall creates flooding in less than 6 hours. Flash floods can also be caused by factors apart from rainfall, like when water goes beyond the levels of a dam.
- While floods have any number of complex origins, flash floods typically stem from sudden, heavy rain. There are other sources as well, like a dam or levee collapsing. A flash flood is any sudden influx of water into a dry area, typically within six hours or less.
- Flash floods are usually characterized by raging torrents after heavy rains that rip through river beds, urban streets, or mountain canyons sweeping everything before them.
- In India, Flash floods have been commonly witnessed in cities like Chennai and Mumbai. Depression and cyclonic storms in the coastal areas of Orissa, West Bengal, Andhra Pradesh, and others also cause flash floods.

Final Thought

- There is need of a comprehensive strategy of monitoring on the ground in hilly areas, planning development works in a way that is sensitive to the region's ecology, and mitigation to reduce the extent of damages.

LEGACY OF SUCCESS CONTINUES IN UPSC CSE 2021
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45⁺ SELECTIONS IN IAS 2021



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BISWA



AIR 240
UTSAV



AIR 269
ANUP



AIR 300
SHIVANI



AIR 319
GAJANAN



AIR 324
AJIT



AIR 325
KAJALE



AIR 355
PRATIBHA



AIR 379
ANURAG



AIR 439
KESHAV



AIR 469
SASHI



AIR 494
ABHINANDAN



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SHUBHAM



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SPARSH



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SHUBHAM



AIR 650
DHARAVATH



AIR 658
SAPAVATH



AIR 673
B S MEENA

AND MANY MORE...

GENERAL STUDIES - II

ELECTORAL BONDS

GS-II POLITY

In News

- According to the State bank of India data “Donations to political parties through Electoral Bonds have crossed the Rs 10,000-crore mark since 2018”.
- This information was given by the State Bank of India (the only bank authorized to sell these bonds) in a reply to the RTI application.

Electoral Bonds

- The Electoral bonds were introduced with the Finance Bill (2017).
- The Union Government has notified the detailed guidelines about the Electoral Bonds Scheme in January 2018**, with the objective to cleanse the system of political funding in the country.
- The Electoral Bond is a bearer instrument like a Promissory Note and an interest-free banking instrument.
 - A bearer instrument is a document that authorizes the holder with the right of ownership or title of the property, such as Currency, shares or bonds.
 - Unlike normally registered instruments, no record is kept about the owners of bearer instruments or the transfer of ownership.
 - Whoever physically holds the bearer document is assumed to be the owner of the property.
- Electoral bonds may be purchased by a person, who is a citizen of India or established in India.**
 - An individual can buy electoral bonds either singly or jointly with other individuals.
 - The Electoral Bond does not carry the name of the payee.
- Electoral bond would be issued/purchased for any value, in multiples of Rs 1,000 from the specified branches of the State Bank of India (SBI).**
 - Electoral Bonds have a validity of 15 days.
- Political parties** registered under Section 29A of the Representation of the People Act, 1951 and also **secured a minimum of 1% of voters polled in the last general election to the House of the People or the Legislative Assembly of the State are eligible to receive electoral bonds.**
- The Electoral Bonds shall be available for purchase for 10 days each in January, April, July and October, as may be specified by the Central Government.
 - An additional period of 30 days shall be specified by the Central Government in the year of the General election to the House of People.
- Electoral Bonds can be encashed by an eligible political party only through their bank accounts with the authorized bank.**
 - The bonds do not have the name of the donor or the receiving political party.
 - It only carries a unique hidden alphanumeric serial number as an in-built security feature.
- Electoral bonds protect the identity of political donors and parties receiving contributions.**
 - Donors who contribute less than Rs 20,000 to political parties through the purchase of electoral bonds need not provide their identity details such as PAN, etc.

Finance Bill (2017)

- Before the bill came into force;**
 - A company donating to a political party could contribute a maximum of 7.5% of the average net profits in the last three financial years.
 - It was required to disclose the details of the contributions made to any political parties along with the name of the political parties to which such contributions were made.
- The Finance Bill (2017) introduced new provisions;**
 - It removed the maximum limit set on the companies for donations to political parties, now there is no limit on companies for donating to political parties.
 - It also removed the requirement for a company to disclose the name of the political parties to which it was donating.
- The bill adds that "contributions will have to be made only through a cheque, bank draft, electronic means, or any other scheme notified by the government to make contributions to political parties."

Arguments in favour of Electoral Bond

- It promotes transparency in funding and donation received by political parties.
- It is an important “electoral reform” toward a “cashless-digital economy”.

- It is a tool to eradicate black money in political funding.

Arguments against Electoral Bond

- The bonds increase the anonymity of political donations, Citizens will not be able to know who is donating how much money to which political party.
- Promoting corruption and lack of transparency in the accounts of all political parties.
- The electoral bonds scheme has opened floodgates to unlimited corporate donations to political parties and anonymous financing by Indian as well as foreign companies which is a threat to Indian democracy.

Concern

- The Election Commission and the Reserve Bank of India objected to electoral bonds and had advised against the issuance of electoral bonds as a mode for donation to political parties.
- It alleged that almost 99% of electoral bonds purchased are of value one crore and 10 lakh denominations which shows that it is not individual citizens but large corporations which are purchasing these bonds with a view to receiving kickbacks from the government.
- The Election Commission of India filed an affidavit in 2019, saying the government's scheme for political funding has legalized anonymity.
- Many major political parties have not disclosed the amount they received through electoral bonds.
- As the bonds are sold through a public sector bank, the government would easily know who is funding which political party.

UNIFORM CIVIL CODE

GS-II POLITY

In News

- The Union Law Minister has stated in the Rajya Sabha that the **government has no plan to set up a committee to implement the Uniform Civil Code (UCC)**.
- The Minister has clarified that the Government has requested the Law Commission of India to examine various issues relating to Uniform Civil Code and to make recommendations.

Related News

- Recently the Uttarakhand State Government announced the formation of an expert committee for the implementation of a Uniform Civil Code.
- The expert committee will review the laws governing marriage, divorce, maintenance, inheritance, adoption and other personal laws.
- Retired judge Justice **Ranjana Prakash Desai will head the expert committee**.
- The committee will examine all laws and matters related to personal law across communities, and draft a uniform civil code.

About Uniform Civil Code

- **Uniform Civil Code comes under Article 44 of the Indian Constitution**, which lays down that the state shall aspire to secure a Uniform Civil Code for the citizens throughout the territory of India.
- The Uniform Civil Code (UCC) calls for the formulation of one law for India, which would apply to all religious communities in matters such as marriage, divorce, inheritance, and adoption.

Origin of Uniform Civil Code

- The origin of the UCC dates back to colonial India when the British government submitted its report in 1835 stressing the need for uniformity in the codification of Indian law relating to crimes, evidence, and contracts, specifically recommending that the personal laws of Hindus and Muslims be kept outside such codification.
- An increase in legislation dealing with personal issues at the far end of British rule forced the government to form the **B N Rau Committee to codify Hindu law in 1941**.
 - The task of the Hindu Law Committee was to examine the question of the necessity of common Hindu laws.
 - The committee, in accordance with scriptures, recommended a codified Hindu law, which would give equal rights to women.
 - The committee recommended a civil code of marriage and succession for Hindus.
- **The Hindu Code Bill**
 - The draft of the Rau Committee report was submitted to a select committee chaired by **B.R Ambedkar** that came up for discussion in 1951 after the adoption of the Constitution.
 - While discussions continued, the Hindu Code Bill lapsed and was resubmitted in 1952.
 - The bill was then adopted in 1956 as the **Hindu Succession Act** to amend and codify the law relating to intestate or

unwilled succession, among Hindus, Buddhists, Jains, and Sikhs.

- The Act reformed the Hindu personal law and gave women greater property rights, and ownership.
- It gave women property rights in their father's estate. The daughter is allotted the same share as is allotted to a son.

Arguments in Favor of Uniform Civil Code

- **A Secular republic needs a Common law for all Citizens rather than differentiated rules based on religious Practices.**
- Courts also Suggested in their judgments' that the government should move toward a uniform civil code including the judgments in the Shah Bano Case.
- It will address the discrimination against vulnerable groups and harmonies to diverse cultural groups across the country.
- Ensure gender justice, and promote women empowerment.
- **The code will simplify the complex laws around marriage ceremonies, inheritance, succession, and adoptions making them one for all.** The same civil law will then apply to all citizens irrespective of their faith.
- Dr B R Ambedkar, while formulating the Constitution had said that a UCC is desirable but for the moment it should remain voluntary, and thus it was added as a part of the Directive Principles of the State Policy in part IV of the Constitution of India as Article 44.

Arguments against Uniform Civil Code

- **Cultural diversity cannot be compromised to the extent that our urge for uniformity itself becomes a reason for a threat to the territorial integrity of the nation.**
- Diversity, both religious and regional, Should not get subsumed under the louder voice of the majority.
- Article 25 of the Indian constitution preserves the freedom to practice and propagate any religion that gets into conflict with the concepts of UCC.
 - **Fundamental Rights v/s DPSPs:** Fundamental rights are justiciable whereas DPSPs are non-justiciable and optional for the state.
- **The demand for a uniform civil code has been framed in the context of communal politics.** A large section of society sees it as majoritarianism under the garb of social reform.

Way Forward

- Discriminatory practices within a religion should be eliminated.
- The achievement of a uniform civil code becomes more desirable when it comes to the diversity of the matrimonial laws, simplifying the Indian legal system and making Indian society more homogeneous. The uniform civil code will envisage uniform provisions that will apply to everyone and which will be based on social justice and gender equality in family matters.
- By Codification of different Personal laws, we can arrive at certain universal Principles that promote equity.
- **The UCC aims to protect vulnerable sections as envisaged by Ambedkar** including women and religious minorities, while also promoting nationalistic fervour through unity.
- The code will simplify the complex laws around marriage ceremonies, inheritance, succession, and adoptions making them one for all. The same civil law will then apply to all citizens irrespective of their faith.

UNDERTRIAL PRISONERS IN INDIA

GS-II POLITY

In News

- According to the latest available data released by the National Crime Records Bureau (NCRB) for 2020, about **76% of all prisoners in India are under trials**, and about 68% of them are either illiterate or school dropouts.
 - Most of the under trial prisoners are "poor or from ordinary families".
- Of the total 4,88,511 prison inmates, 3,71,848 were found to be under trials. Among the under trials;
 - About 20% were Muslims, while about 73% were Dalits, tribals or OBCs.
- Delhi and Jammu and Kashmir were found to have the highest ratio of under trials in jails at 91%.
- Nearly 27% of all under trials were found to be illiterate, and 41% had dropped out before Class 10.
- The delay in the verdict of cases creates disillusionment among litigants and undermines the capability of the judicial system to ensure justice efficiently and effectively.

Concern

- **Over 31 million cases are pending in Subordinate Courts across the country.**
- Case pendency Hurts investors' confidence.
- **Economic activity is getting affected by high pendency and delays across the legal system.**
- **It adds a burden on Courts and collaterally harms other litigants.**
- It increases project costs and delays projects.

- Slows down administrative processes, delaying decision-making.
- Diversion of precious resources.
- Effects ease of doing business.

Steps by the Government

- **Adoption of "National Litigation Policy 2010" to transform government into an Efficient and Responsible litigant.**
- All states formulated state litigation policies after National Litigation Policy 2010.
- Legal Information Management and Briefing System (LIMBS), was created in 2015 with the objective of tracking cases to which the government is a party.
- **The Supreme Court advised the centre that criminals sentenced to imprisonment for 6 months or a year should be allocated social service duties rather than be sent to further choke the already overflowing prisons.**

Steps need to be taken

- National Litigation Policy should be revised.
- **Address all 3 stages of dispute:**
 - Pre-litigation
 - Litigation
 - Post litigation stage
- Establish Fair accountability mechanisms, Consequences for violation must be provided.
- **Appointment of a Nodal Officer to regularly monitor the status of the cases in every department.**
- **Promotion of alternative dispute resolution mechanisms to encourage mediation.**
- Coordinated action between government and judiciary.
- Judicial capacity should be strengthened in the lower courts to reduce the burden on higher courts.
- Increase expenditure on the judiciary.
- **Improve courts case management and court automation system.**
- **Create subject-specific benches.**
- Tax departments must limit their appeals as their success rate is less than 30% at all three levels of the judiciary.
- Robust internal dispute resolution mechanisms
- Step-by-step online dispute resolution must be adopted as done by the Ministry of Consumer Affairs.
- **Judges should write Shorter and more Pointed judgments.**

Way Forward

- **Courts need to monitor the progress of Cases based on urgency and type of Case.**
- **Courts must set a time limit to dispose of certain types of Cases.**
- Understand why Some Courts perform well despite a Shortage of judges and adopt Such Courts as role models.
- **Analytics tools can be developed in a manner that helps the judges monitor Cases based on parameters Such as how long an accused has been in judicial custody, Cases that can affect the General public, and Cases that have been long pending.**
- Alternative methods should be used for dealing with non-criminal offenders and petty criminals.

HUMAN TRAFFICKING

GS-II POLITY

In News

- Recently, a group of activists and the local police rescued a 16-year-old-girl from Kolkata's Sonagachi area; the child was produced before the Child Welfare Committee and has been sent to a protection home in Kolkata.
- July 30 is observed as World Day Against Trafficking in Persons by the United Nations.

Human Trafficking

- **Human trafficking is defined as the forceful exploitation of a person.**
- It is the trade of humans for forced labour, Prostitution, etc.
- **According to the data released by National Crime Records Bureau, the highest numbers of persons were trafficked for forced labour, followed by prostitution.**

Root Causes of Human trafficking

- The Reasons behind increasing trafficking vary from country to country and often differ from one country to another.
- **Social, political, economical, cultural and other factors play a key role in Promoting Trafficking. Women and children are extremely vulnerable to trafficking.**

- Socio-economic conditions like poverty, caste discrimination or violence, lack of economic opportunity, Political violence, Climate change, and natural disasters influence trafficking. Displacement of populations increases their vulnerability to becoming a victim of trafficking.
- **Increasing penetration of broadcast and telecommunication services and social media in rural areas has increased the desire of people to migrate to the city and, with that; they are becoming easy targets for traffickers.**
- In Some Poor families, Parents sell their children due to their weak financial condition, and also in the hope that their children would get a better standard of living and more opportunities in life.
- Other factors like porous borders, corruption among Government officials, and weak enforcement of Anti-trafficking laws.

Major Steps by Government

- The government enacted the **Immoral Traffic (Prevention) Act, of 1986** to deal with trafficking for sexual exploitation.
- **Bonded Labour Regulation Act, 1986 and Child Labour Regulation Act, 1986 deal with the exploitation of bonded labour.**
- **India is part of the United Nations Convention Against Transnational Organized Crimes, and its Protocol to Prevent, Suppress and Punish Trafficking.**
- The Trafficking of Persons (Prevention, Protection and Rehabilitation) Bill, 2018 was introduced in Parliament. It contains provisions for the prevention, rescue, and rehabilitation of trafficked persons.
- The Union government created a **National Anti-Trafficking Bureau** to monitor the investigation of cases at the national level.

Way Forward

- Human Trafficking is an organised crime and operated across domestic and international borders, the nature of the crime needs strong cooperation and intelligence sharing between different investigating agencies.
- **Steps must be taken for the socio-economic development of potential victims to reduce their vulnerability.**
- Focus on improving children's access to educational and vocational training, especially among girls and minority groups.
- Promoting job opportunities for women by supporting Self Help Groups (SHGs) and organizing training courses to empower them.
- Prohibiting the services provided through trafficked persons, like child labour, prostitution, etc.
- **Need to ensure a minimum standard of living for all people, Strict Border control through proper fencing and regular patrolling, Prevent corruption in bureaucracy, etc, to curb the menace of trafficking.**
- Steps should be taken to set up Protection Homes across the country, to provide shelter, food, counselling, and medical services to victims.
- **Our development goals must include both economic development and social inclusion.**

PERSONAL DATA PROTECTION BILL 2019

GS-II POLITY

In News

- The Union government has **withdrawn the Personal Data Protection Bill from Parliament.**
- It is looking for coming up with a "comprehensive legal framework" for regulating online space including separate legislation on data privacy, the overall internet ecosystem, cyber security, telecom regulations, and harnessing non-personal data for boosting innovation in the country.

What is Data Localization?

- **Data localization refers to the act of storing data on any physical device that may be present within the territorial borders of a country where the data has been generated.** Some governments often restrict free-flowing data and the data that could impact government operations in a region. Many governments attempt to protect and promote security across the borders to encourage data localization.

Advantages of Data Localization

- In today's time, **data is considered to be the new oil**, and this makes it very valuable. If the data is analyzed accurately, then it **can form the backbone of any successful business.**
- Governments looking to implement data localization might be seeking to **give their local corporations a competitive edge.** The national government can prevent the flow of data to external countries and thus, this data can be made available for internal use by domestic companies only. The **informational asymmetry caused will prove to be beneficial for local companies.**
- **Data is a national resource**, and thus the government holds a right to the revenue that is generated from the data. Similar to the inflow and outflow taxation of goods and services, the movement of data can also undergo taxation. The government can use the additional taxes generated from data for developing newer programs.

Disadvantages of Data Localization

- **The Foundation of the Internet lies in the free movement of data.** In case the free flow of data is affected by imposing taxes or extreme protectionism, this will eventually destroy the Internet.
- Most companies prefer using the Internet as a medium to reach their customers because it is cheaper and free of excessive regulation. When robust data localization and protection laws are implemented, then **there is a high possibility that the Internet may face an abrupt end leading to its 'death'.**
- Another disadvantage that data localization holds is the **security problem that is associated with the storage of data in a single location.** The concept of storing data in a single geographical region is opposite to the diversification approach followed by the MNCs. Also, the **citizens of the country are not willing to allow the government to spy on their data.** If all the data is stored within the geographical boundaries, then the **government can collate all this data and even invade an individual's privacy, if needed.**

Challenges to Data Localization in India

- **Presently, India doesn't have any infrastructure to support the security of data being generated in the country.** Without a secured infrastructure, the **data remains prone to all kinds of cyber-attacks, and also there is a severe risk involved.** With laws being implemented, it remains a challenge to develop an efficient infrastructure at a quick pace.
- **The storage of data in India includes higher operational costs for payment system operators.** In the case of cross-border transactions, data has to be stored in two places, which could increase the costs, and there is a high chance that these extra incurring costs will fall on to the consumers.
- Data localization can also be viewed **against the intellectual property rights of an individual.** This is because the individuals use their intelligence to form a system that can benefit from the data it has generated. Though, in the end, the consumers are deprived of these benefits, and a third person might use the data in their favour.

Global Effects of Data Localization

- On a global scale, data localization regulations have created a significant impact on the economy in an era where economic growth is driven by the Internet.
- Internet is also the key enabler for trading taking place across several industries. With restrictions added on data storage and transfer, **data localization holds a key threat to the free flow of information taking place across the borders and maintenance of global supply chains.**
- Due to the imposed regulations, there is a **great impact that takes place on email communication, personal records, and social media services, adding to the limited access to information on which the manufacturing and service economies are heavily dependent.**

Present Data Laws in Effect in India

- As of now, **there is only a single mandatory rule for data localization in India. This is governed by the Reserve Bank of India (RBI) and is meant for payment systems.** Besides this, other bill drafts are yet to take the form of a law.
- The other prominent evidence present in this context is the Data Protection Bill of 2018. The bill itself has got a fixed set of requirements on the data transfer that takes place across the borders. The draft e-commerce policy has clauses on the cross-border transfer of data.

Need for data localization

- **Will help law-enforcement access data for investigations and enforcement.**
- Proponents highlight **security against foreign attacks and surveillance,** harkening notions of data sovereignty.
- Many domestic-born technology companies, which store most of their data exclusively in India, support localisation.
- Reliance Jio has strongly argued that **data regulation for privacy and security will have little teeth without localisation,** calling upon models in China and Russia.
- Instances of **cyber-attacks and surveillance will be checked.** Recently, many WhatsApp accounts were hacked by Israeli software called Pegasus. Social media is being used to spread fake news, which has resulted in lynchings, and national security threats, which can now be monitored, checked and prevented in time.
- Data localization will increase **the ability of the Indian government to tax Internet giants.**
- Strong data protection legislation will also **help to enforce data sovereignty.**

Way Forward

- **Data Privacy will require a balancing act between personal liberty and sovereign securities such as prevention and investigation of crime and National security threats.** Another legitimate concern of the State that needs to be balanced with the Right to Privacy, recognized in Puttaswamy, is social welfare measures.

- The **illegitimate commercial gaining** enjoyed by enterprises at the cost of the privacy of individuals is also **likely to vanish due to data localization**.
- But Data protection is a complex exercise, and the law will need amendments from time to time depending on the problems that crop up. Thus, it must be brought into the Statute book expeditiously.

NITI AAYOG'S GOVERNING COUNCIL MEETING

GS-II POLITY

In News

- The 7th Governing Council meeting of NITI Aayog was held on 7th August 2022.
- The **Prime Minister will chair the meeting** at Rashtrapati Bhawan Cultural Centre, New Delhi.
- The **objective of the council is to increase collaboration and cooperation between the Union and States/ Union Territories**.
- The council to discuss various issues including crop diversification and achieving self-sufficiency in oilseeds and pulses, implementation of the National Education Policy–school education, urban governance, etc.

NITI Aayog's Governing Council

- It is the premier body trusted with **developing a shared vision of national priorities and strategies with the active involvement of States and Union Territories**.
- It is a platform to discuss inter-sectoral, inter-departmental and federal issues.
- **It comprises:**
 - The Prime Minister of India.
 - Chief Ministers of all the states and union territories with the legislature.
 - Lt Governors of other UTs.
 - Ex-Officio Members; Vice Chairman, NITI Aayog; Full-Time Members, NITI Aayog.
 - Union Ministers as Special Invitees.

NITI Aayog

- Planning Commission Inspired by the USSR/Soviet Model, Prime Minister established a Planning Commission in 1950 to design the five-year Plans for India.
 - In 2015, it was replaced by a new organisation named **National Institution for Transforming India (NITI)**
- **Promote Cooperative Federalism**
 - Governing Council of NITI Aayog has Lieutenant Governors of Union Territories and State Chief Ministers.
 - NITI Aayog Constituted a Committee of State Chief Ministers to examine important issues.
- **Promote Competitive Federalism**
 - NITI Aayog has Prepared online dashboards to rank the States on various indicators of development Such as;
 - Sustainable Development Goals (SDG) India Index.
 - Health Index.
 - School Education Quality Index.
 - Digital Transformation Index.
 - Launched Aspirational District Programs for monitoring the progress of backward districts.
- **NITI Aayog has not been given the mandate or Powers to impose Policies on States.**
 - NITI Aayog is a think tank or an advisory body.
- The Powers for allocation of funds have not been given to the NITI Aayog. The Powers are with the Finance Ministry.
- **As a 'think-tank', Niti Aayog** has helped the government In framing various Policies on;
 - Clean energy
 - Methanol based economy
 - Infrastructure, human development etc.
 - The model acts on agricultural land leasing, livestock Selling etc.
- NITI Aayog regularly organizes Seminars, Workshops, and Conferences.
- NITI initiated Atal Innovation Mission (AIM) to help Startups. NITI is developing the National Program on Artificial Intelligence.
- NITI's approach is modernised, forward-looking, and less bureaucratic; NITI Aayog plays an important role as a think tank for Economic growth, Human development and Good governance in India.

DEPUTATION OF ALL INDIAN SERVICES**GS-II POLITY****In News**

- According to the recently released data by the Ministry of Home Affairs Ministry, “No senior-rank police officer has aspired to a posting in the Union government”.
 - The Ministry data shows that **only 3 Indian Police Service (IPS) officers have presented themselves to be available for Central deputation.**
 - Shortages of All India Services (AIS) officers are affecting the Union government's functioning.
- According to the data released by the Ministry, **there are 263 vacancies for IPS officers in 17 Central organisations** such as the Central Bureau of Investigation (CBI), Central Armed Police Forces (CAPF) and the Intelligence Bureau (IB).
 - Most Vacant vacancies are in the rank of DIGs (94) and SPs (137).

All India Services

- All India Services (AIS) **include Indian Administrative Service (IAS), Indian Police Service (IPS) and Indian Forest Service (IFS).**
- The AIS officers are **recruited by the Union government, but their services are placed under various State cadres.**
 - They can serve both the State and the Union.
- The Ministry of Personnel, Public Grievances and Pensions is the regulating authority for the Indian Administrative Service (IAS).
 - The Ministry of Home Affairs is the regulating authority for the Indian Police Service (IPS)
 - The Ministry of Environment, Forest and Climate Change is the regulating authority for the Forest Service.
- The IAS and IPS are recruitment through an examination conducted by the Union Public Service Commission (UPSC) based on the annual Civil Services Examination.
 - Officers of the Indian Forest Service are selected based on the Forest Service Examination.
 - **Since 2012, the preliminary examinations of both examinations are combined.**
- The **Department of Personnel and Training (DoPT)** has informed the Parliament that there are 1,472 vacancies in IAS and 864 vacancies in IPS in various States.
 - The total sanctioned strength of IAS and IPS officers are around 6,700 and 4,900 respectively.

Deputation of All Indian Services

- Before an All India Services officer is called for Central deputation, **his or her consensus is required.**
- Officers would be **considered for Central deputation if they are selected by the Central Police Establishment Board (CPEB) headed by the Union Home Secretary.**
- For an appointment at the IG (Inspector General of Police) post, the selected officers' names are sent to the Union Appointments Committee of the Cabinet headed by the Prime Minister for approval.
- In February 2022, the Ministry of Home Affairs amended the tenure policy for IPS **doing away with the mandatory requirement of empanelment of IPS officers at the DIG level.**
 - Empanelment is the process of preparing a list of suitable officers to be eligible to be appointed as the Joint Secretary, Additional Secretary, and Secretary to the Government of India.
- According to the recent policy change, **“only officers with a minimum of 14 years of experience will be eligible to be appointed to the post of DIG by the Union government.”**

Way Forward

- 2nd Administrative reform committee suggested **establishing a Central Civil Services Authority, with the responsibility of fixing tenure for Civil Servants** and the decision of the Authority should be binding on the Government.
- Performance Management System Should be mandatory for every organization.
 - Rewarding Good Performance.
 - No Penalty or Punishment, unless an inquiry is Conducted and the accused government Servant has been given an opportunity of being heard.
- **Maintain Political neutrality and impartiality in the appointments and posting** of Civil Servants. Promote Code of Ethics for Ministers as well as Code of Conduct for Public Servants.
- Need to **formulate transparent rules for recruitment, appointment and posting to avoid Complaints of favouritism, Nepotism, Corruption and Abuse of Power.**

THE ENERGY CONSERVATION (AMENDMENT) BILL**GS-II POLITY****In news**

- The Union Power Minister has introduced the Energy Conservation (Amendment) Bill in the Lok Sabha.

Background

- India enacted the **Energy Conservation Act, 2001** which has at its core efficient use of energy and its conservation.
- This act made way for the **establishment and incorporation of the Bureau of Energy Efficiency**.
 - The Bureau of Energy Efficiency is an agency of the Government of India, under the Ministry of Power created in March 2002 under the provisions of the nation's 2001 Energy Conservation Act. The agency's function is to develop programs which will increase the conservation and efficient use of energy in India.
- The act was subsequently **amended in 2010 to address various new factors which emerged with the development of the energy market**.

Key features of the Energy Conservation Act, 2001

This act gives the power to the central government and in some cases; the state also gets the power to:

- **Fix the energy usage standards** for specific appliances and equipment.
- Give direction that there should be a mandatory display of labels specific to equipment and appliances.
- **Stop building, importing, and selling items which are not to the standards.**
- Inform energy concentrated businesses, different foundations, and business structures as assigned customers
- Set up and recommend energy utilization standards and guidelines for assigned buyers
- Prescribe or make changes in Energy Conservation Building Codes (ECBC) to local conditions for energy conservation and efficient use of energy in a new commercial building with a contract load of 500 kW.
- **Make and provide Central and State Energy Conservation Fund.**

2022 Amendment Proposal

- With the 2022 amendment, the **government seeks to support Prime Minister Narendra Modi's stance of offering 'Panchamrit'**, or five nectar elements, as a part of the country's commitment to a low-carbon development strategy.
- **'Panchamrit' includes India's commitment to;**
 - Install 500 gigawatts (GW) of non-fossil energy capacity by 2030.
 - Reduce emission intensity of GDP by 45% over 2005 levels.
 - Source 50% of the electricity from non-fossil sources by 2030.
 - Reduce carbon emissions by 1 billion tonnes by 2030.
 - Achieve net-zero by 2070.

Provisions of the Bill

- The bill seeks to **mandate the use of non-fossil sources, including green hydrogen, green ammonia, biomass and ethanol for energy and feedstock** to achieve the twin target of reducing dependence on fossil fuels and achieving energy security.
- It also envisages establishing carbon markets and bringing large residential buildings within the fold of the energy conservation regime.
- The key objectives of the bill also include **enhancing the scope of the energy conservation building code, amendment of penalty provisions, and increasing members** in the governing council of the Bureau of Energy Efficiency.
- It also aims to **empower the state electricity regulatory commissions to make regulations for the smooth discharge of its functions.**

Way Forward

- Monitoring energy is a significant method to lessen the strain on nature and cut down power costs.
- Energy preservation **supports the eco-friendly way of life by giving energy**, which saves the earth.
- It is considered necessary to have legal provisions to prescribe minimum consumption of non-fossil energy sources as energy or feedstock by the designated consumers.
 - This will help in the reduction of fossil fuel-based energy consumption and resultant carbon emissions to the atmosphere.
 - Similarly, a need is also felt to provide a legal framework for a carbon market to incentivize actions for emission reduction leading to increased investments in clean energy and energy efficiency areas, by the private sectors.

CRIMINAL PROCEDURE (IDENTIFICATION) ACT 2022

GS-II POLITY

In News

- Recently the Union Home Ministry issued a notification to implement the Criminal Procedure (Identification) Act, 2022.
 - The new Act will **repeal the Identification of Prisoners Act, 1920**.
- The Act provides a **legal sanction to law enforcement agencies** for "taking measurements of convicts and other persons for identification and investigation of criminal matters."
- The Union government stated that the **sole purpose is to improve the conviction rate in the country and to safeguard the human rights of law-abiding citizens**.



Details

- Under the new Act, The Measurements and photographs for identification **would serve 3 main purposes**;
 - Establish the identity of the culprit against the person being arrested.
 - Identify suspected repetition of similar offences by the same person.
 - Establish a previous conviction.

Provisions under Identification of Prisoners Act, 1920

- The police have powers of arrest, but that does not give them the right to search a person.**
 - The police needed legal sanctions to search the person and collect evidence. These legal sanctions were designed to maintain a balance between the rights of an individual and the interests of society.
 - It became essential when the recording of newer forms of evidence such as fingerprints, footprints and measurements became more accurate and reliable.
- Over the years, many legal experts and activists have demanded to amend/update the Identification of Prisoners Act, 1920.
- In 1980, the 87th Report of the **Law Commission of India recommended several amendments**;
 - Amend the Act to expand the scope of measurements to include "palm impressions", "specimen of signature or writing" and "specimen of voice".
 - Allowing measurements to be taken for proceedings other than those under the Code of Criminal Procedure (CrPC).

Key Features of the Criminal Procedure (Identification) Act, 2022.

- It would **allow the police and prison authorities to collect, store and analyse physical and biological samples, including retina and iris scans**.
- It would empower the police to collect finger impressions, palm print impressions, footprint impressions, iris and retina scans, footprint impressions, physical, and biological samples and their analysis, and behavioural attributes including signatures, handwriting or any other examination.
- Biological samples can be forcibly collected from the convicted or persons arrested for crimes against women or children, or in case the crime attracts a minimum of 7 years in jail.**
 - It can also be taken on the order of a magistrate to assist the investigation.
- It also seeks to apply the above provisions to persons held under any preventive detention law.**
 - As per the provisions of the act any person convicted, arrested or detained under any preventive detention law will be required to provide the above-mentioned measurements to the police or a prison official.

- If any person resists or refuses to allow the taking of such measurements, it shall be lawful for the police officer or prison officer to take such measurements in such manner as may be prescribed.
 - Resistance to or refusal to allow the taking of measurements under this Act shall be deemed to be an offence under section 186 of the Indian Penal Code.
- It would authorize the police to take and preserve records of convicts and other persons for identification and investigations.
- It would repeal the existing Identification of Prisoners Act, 1920.

Implementing body

- The National Crime Records Bureau (NCRB) will be the repository of physical and biological samples, signatures and handwriting data that can be preserved for at least 75 years.
- The State Government and Union territory Administration may notify an appropriate body to collect preserve and share the measurements in their respective jurisdictions.

Arguments in favour of the Act

- It will Protect the Human rights of the law-abiding victims of crime
- It will improve the conviction rate in the country.
- It will ensure a foolproof mechanism to prevent any data leak or misuse.
- Providing the sample will be voluntary for a person detained under any preventive law, they could not be forced to give the sample.
- No analysis or brain-mapping test would be performed without the person's approval.

Arguments against the Act

- The issue of data protection.
- Possible misuse of the proposed law.
- Violation of the citizen's right to privacy and other fundamental rights.

Criminal Justice System in India

- The Criminal Justice System in India is a century-old system established by the colonial power.
- This system hardly experienced any substantial changes even after 70 years of Independence.
- The Criminal Justice system includes the agencies of government charged with enforcing law and order, deciding criminal offences, and correcting criminal conduct.
- The criminal justice system has the power to control crime and punish criminals and ensure rule of law in society.
- Source of Criminal law in India: Indian Penal Code of 1860, Protection of Civil Rights Act 1955, etc.
- The Criminal Justice System investigates, decides whether a person is guilty or not, and then imposes penalties on those who violate the established laws.
- Criminal law and criminal procedure are part of the concurrent list of the 7th schedule of the constitution.

Why reform the Indian Criminal Justice System?

- Less than 20% of the total people booked for criminal offences are finally convicted. Low rate of conviction points to the inefficiency of the Criminal Justice System in India.
- Century-old Indian Criminal Justice System has promoted dissatisfaction among people due to its lengthy and costly nature and also increased the burden on the judiciary.
- Lack of Cooperation and coordination among the judiciary, the prosecution and the police.
- A large number of guilty go unpunished. On the other hand, many innocent people remain as under trial prisoners as well. According to NCRB data, 67% of our total prison population comprises under trial prisoners.
- The nature of crime is changing fast in the world of digital connectivity and technological innovations.

Steps were taken by the government to reform the system

- The entire Code of Criminal Procedure (CrPC) was amended in 1973.
- The Vohra Committee was appointed for reforming the Criminal Justice System in India.
- Malimath Committee was formed by the government to suggest reform in the Indian criminal justice system.
- Adoption of "National Litigation Policy 2010" to transform government into an Efficient and Responsible litigant.
- Legal Information Management and Briefing System (LIMBS), was created in 2015 with the objective of tracking cases to which the government is a party.
- Nearly 99% of the police stations in the country have been linked to the Crime and Criminal Tracking Network and Systems.

Way Forward

- The Identification of Prisoners Act, 1920 was colonial legislation, its repetition in the Criminal Procedure (Identification) Act, 2022 has raised some concerns related to fundamental rights.
 - According to some activists, the act violet the right to privacy as per the Puttaswamy case judgment.
 - Concerns that data processing may go beyond the recording of core measurements, and fear of data leakage or data theft.
- The Government needs to **take concrete steps to redress the grievances raised by different stakeholders to ensure smooth implementation of the law.**

FUNDAMENTAL DUTIES

GS-II POLITY

In News

- Recently the **Chief Justice of India has stated that the fundamental duties mentioned in the Indian Constitution are not just to serve a "pedantic or technical" purpose, but they are meant to guide citizens to bring social transformation.**
- He highlighted that "Our Constitution is the fundamental document which regulates the relationship between the citizens and the government. While it has granted us inalienable rights, it places upon us certain fundamental duties".

Fundamental Duties

- The **original constitution contained only the fundamental rights and not the fundamental duties.**
- Fundamental duties **under Article 51A were added by the 42nd Amendment.**
- They were **included under Part IV-A of the Constitution on the recommendations of the Swaran Singh Committee.**
- **Originally 10 in number, increased to 11 by the 86th Amendment.**
- The Fundamental Duties in the Indian Constitution are **inspired by the Constitution of the USSR.**
 - None of the Constitutions of major democratic countries like the USA, Canada, France, Germany, and Australia and so on specifically contain a list of duties of citizens.
 - The Japanese Constitution is, perhaps, the only democratic Constitution in the world which contains a list of duties of citizens.
- **Some of the Fundamental Duties are moral duties while others are civic duties.**
- **They reflect the values of the Indian tradition, mythology, religions and practices.**
- Unlike Fundamental Rights, the **Fundamental Duties are confined to citizens only and do not extend to foreigners.**
- Like the Directive Principles, the **fundamental duties are also non-justiciable.** The Constitution does not provide for their direct enforcement by the courts.
- There is no legal sanction against their violation. However, the **Parliament is free to enforce them through legislation.**

List of Fundamental Duties

- To abide by the Constitution and Respect its ideals and institutions, the National Flag and the National Anthem.
- To cherish and follow the noble ideals which inspired our national Struggle for freedom.
- **To uphold and protect the sovereignty, unity and integrity of India.**
- To defend the country and render national service when called upon to do so.
- **To promote harmony and a spirit of common brotherhood amongst all people of India transcending religious, linguistic and regional or Sectional diversities; to renounce practices derogatory to the dignity of women.**
- To value and preserve the rich heritage of our composite culture.
- **To protect and improve the natural environment including forests, lakes, rivers, and wildlife and to have compassion for living creatures.**
- **To develop the scientific temper, humanism and the spirit of inquiry and reform.**
- To safeguard public property and to abjure violence.
- To strive towards excellence in all spheres of individual and collective activity, so that the nation constantly rises to higher levels of endeavour and achievement.
- **A parent or guardian, to provide opportunities for education to his child between 6 to 14 years of age. (Added by the 86th Constitutional Amendment Act of 2002).**

Significance of the Fundamental Duties

- They serve as a reminder to the citizens that while enjoying their rights, they should also be aware of the duties they owe to their society and their country.
- **They serve as a warning against anti-national and antisocial activities** like burning the national flag, destroying public property and so on.
- They serve as a **source of inspiration for the citizens.**
- They **create a feeling that the citizens are active participants in democracy.**

- They help the courts in examining and determining the constitutional validity of a law.
- They are enforceable by law. Hence, the Parliament can provide for the imposition of penalty or punishment for failure to fulfill any of them.

Way forward

- The need of the hour is to remind citizens that fundamental duties are as important as fundamental rights under the Constitution.
- The time has come to balance rights, liberties and freedoms, and Fundamental duties.

BENAMI TRANSACTION (PROHIBITION) ACT

GS-II POLITY

In News

- The Supreme Court of India has stated that the **amendments introduced to the Benami law in 2016 were “unconstitutional and arbitrary”**, as these laws were applied retrospectively and authorized the government to seize “any property” doubtful of a Benami transaction.

The reason behind Supreme Court Judgment

- The Benami Law 2016 amended the Benami Act of 1988, and it introduced mandatory imprisonment of 3 years for those who were involved in any Benami transactions between 5th September 1988 and 25th October 2016.
 - According to the 2016 law, **a person can be sent to jail for his/her involvement in any Benami transaction done in the last 28 years before this law was made.**
- Supreme Court highlighted that the **2016 provision violated Article 20(1) of the Indian Constitution.**
 - Under Article 20(1) **no person should be convicted of any offence, except for violation of the law in force at the time of the execution of the act charged as an offence.**

Key Features of the Benami Law 2016

- The Benami law of 2016 has amended the Benami Transactions Act, of 1988.
 - The Benami Transactions Act, 1988, prohibits benami transactions and provides for confiscating benami properties.
- **The law aims to:**
 - Amend the definition of Benami transactions
 - Establish adjudicating authorities and an Appellate Tribunal to deal with Benami transactions.
 - Decide the Penalty for entering into Benami transactions.
- It defines a Benami transaction as a transaction where a property is held by or transferred to a person, but the transaction amount was paid by another person, it also includes transactions where:
 - The transaction was made in a fictitious name.
 - The owner was not aware of or knows the property owner.
- **Specific cases were exempted from the definition of the Benami transaction.** These cases include where a property is held by:
 - A member of a Hindu undivided family, where the property was held for other family members' benefit.
 - Property in the name of his spouse or child and the transaction amount was paid for from the person's income.
- An Authority to acquire benami properties was also established. **The law established four authorities to conduct inquiries or investigations regarding benami transactions:**
 - Initiating Officer.
 - Approving Authority.
 - Administrator.
 - Adjudicating Authority.
- An Initiating Officer may issue a notice if he/she thoughts that a person is a benamidar.
 - The Officer may hold the property for 90 days with permission from the Approving Authority.
 - The Officer may pass an order to continue the holding of the property even after 90 days.
- The Initiating Officer will submit all documents to Adjudicating Authority.
 - The Authority will examine documents and evidence and pass an order on whether or not to hold the benami property.
- Based on an order passed by Adjudicating Authority, the Administrator will manage the property.
- It established an Appellate Tribunal to hear appeals against the Adjudicating Authority.
- Certain session courts were designated as Special Courts.
- Imprisonment up to 3 years, or a fine, or both for involvement in benami transaction.
- Imprisonment of 6 months up to 5 years for providing false information.

Way Forward

- Benami transactions could be eliminated by the digitization of land records.
- Amendments in the Transfer of Property Act, 1882 and Registration Act, 1908 may be introduced to ensure:
 - Online registration of all immovable properties.
 - Linkage of Aadhar and PAN numbers of all parties involved in the purchase of a property.
 - Sharing of data by the registration authorities with tax authorities.

ZONAL COUNCIL

GS-II POLITY

In News

- The **Union Home Minister chaired the meeting of the Central Zonal Council in Bhopal.**
- The meeting was attended by the chief ministers of Madhya Pradesh, Uttarakhand, Uttar Pradesh, and Chhattisgarh through the virtual medium.
- The council discussed issues of common interests in areas of security, road, transport, industries, water, power, and economic and social planning.

Zonal Councils

- Zonal Councils aim to **promote collaboration and coordination among states, UTs, and the Union.**
- They discuss and give recommendations on several topics.
- They are only consultative and deliberative bodies.
- The **States Reorganization Act of 1956 established these statutory entities.** The country was divided into 5 zones by the Act:
 - Northern Zone
 - Central Zone
 - Eastern Zone
 - Western Zone
 - Southern Zone
- **Each zonal council is made up of**
 - The Union Home Minister (who acts as a chairman).
 - CM of all States in Zone + 2 other ministers from the states (Each CM acts as a Vice-Chairman by rotation, holding office for 1 year at a time).
 - Administrators of all UTs in the zone.

North-Eastern Council

- A further Act of Parliament, the **North-Eastern Council Act of 1971, established a North-Eastern Council in addition to the previous Zonal Councils.**
- Assam, Manipur, Mizoram, Arunachal Pradesh, Nagaland, Meghalaya, Tripura, and Sikkim are among its members. Its responsibilities are similar to those of zonal councils, with a few exceptions.
- It is required to examine the actions taken by member states to maintain security and public order in the region regularly.

Significance of Zonal council

- Zonal councils **help in designing a collaborative strategy** through discussions and exchange of views between the Union and States on important issues.
- It takes up issues involving the Union and states or between many states.
- The zonal councils provide a platform for resolving disputes between the Union and the States and among many States.
- Zonal Meetings are used by the Union, States and Union Territories to share their best practices.
- **Zonal councils also discuss a wide range of issues, including;**
 - Boundary-related disputes.
 - Security.
 - Infrastructure-related matters like road, transport, industries, water, and power.
 - Forests and environment.
 - Housing.
 - Education.
 - Food security
 - Tourism
 - Transport

NATIONAL FOOD SECURITY ACT

GS-II POLITY

In News

- The **Supreme Court of India has directed the Union government to expand the coverage under the National Food Security Act (NFSA).**
 - The main objective of the verdict was to provide benefits to needy persons and citizens under the provisions of the

National Food Security Act (NFSA).

- The Supreme Court also **directed the States to register unorganized workers, including migrant labourers, on the e-Shram portal within 6 weeks.**

Food Security

- The basic concept of food security is to ensure that all people, at all times, should get access to basic food.
- The right to food is part of the fundamental right to life enshrined under Article 21 of the Indian Constitution.
- The government enacted the National Food Security Act, of 2013 to shift the approach from welfare to a rights-based approach.
- **National Food Security Act, 2013**
- The National Food Security Act, 2013 was notified to **provide food and nutritional security.**
- The **objective of the Act is to provide food and nutritional security** in the human life cycle approach, by ensuring access to an adequate quantity of quality food at affordable prices for people to live a life with dignity.
- The Act **provides for coverage of up to 75% of the rural population and up to 50% of the urban population** for receiving subsidized food grains under the Targeted Public Distribution System (TPDS), thus covering about two-thirds of the population.
- The eligible persons will be entitled to receive 5 Kg of foodgrains per person per month at subsidized prices of Rs. 3/2/1 per Kg for rice/wheat/coarse grains.
- The existing Antyodaya Anna Yojana (AAY) households, which constitute the poorest of the poor, will continue to receive 35 Kg of foodgrains per household per month.
- Corresponding to the all-India coverage of 75% and 50% in the rural and urban areas, **State-wise coverage is determined by the Central Government.**
- The work of identification of eligible households is to be done by States/UTs.
- Pregnant women and lactating mothers and children in the age group of 6 months to 14 years are entitled to meals as per prescribed nutritional norms **under Integrated Child Development Services (ICDS) and Mid-Day Meal (MDM) schemes.**
- Children up to 14 years of age are entitled to nutritious meals as per the prescribed nutritional standards. In case of non-supply of entitled food grains or meals, the beneficiaries will receive a food security allowance.
- Besides meals to pregnant women and lactating mothers during pregnancy and six months after childbirth, such **women are entitled to receive maternity benefits of not less than Rs. 6,000.**
- The eldest woman of the household age 18 years or above be the head of the household to issue ration cards.
- Grievance redressal mechanism at the District and State levels. States will have the flexibility to use the existing machinery or set up separate mechanisms.

E-Shram Portal

- The Ministry of Labour and Employment has developed the e-SHRAM portal for building a National Database of Unorganized Workers (NDUW).
- The Portal was developed to extend **the benefits of the social security schemes to unorganized sector workers.**
- It is the first-ever national **database of unorganized workers including migrant workers, construction workers, gig and platform workers, etc.**
- The following is required to register on the portal:
 - Aadhar Number
 - The mobile number is linked with Aadhaar
 - Savings Bank Account Number
- It created a **centralized database of all unorganized workers** including Construction Workers, Migrant Workers, Gig and Platform workers, Street Vendors, Domestic Workers, Agriculture Workers, etc.
- Smooth Sharing of information in respect of registered unorganized workers with various stakeholders such as Ministries/ Departments/ Boards/ Agencies/ Organizations of the Central & State Governments.

COOPERATIVE FEDERALISM**GS-II GOVERNANCE****In News**

- The Prime Minister of India has stated that there is an urgent need to develop a spirit of healthy competition among state governments, as it will ensure the development of the nation.
- The Prime Minister highlighted that the Centre and states may have different schemes or different styles of working, but dreams for a nation will remain identical. He also lauded states for playing a significant role in India's growth.
- NITI Aayog has played an important role in facilitating healthy competition among states and Union Territories by ranking them on several parameters.
- According to the NITI Aayog ranking of states, would encourage them to improve their performance.

Federalism

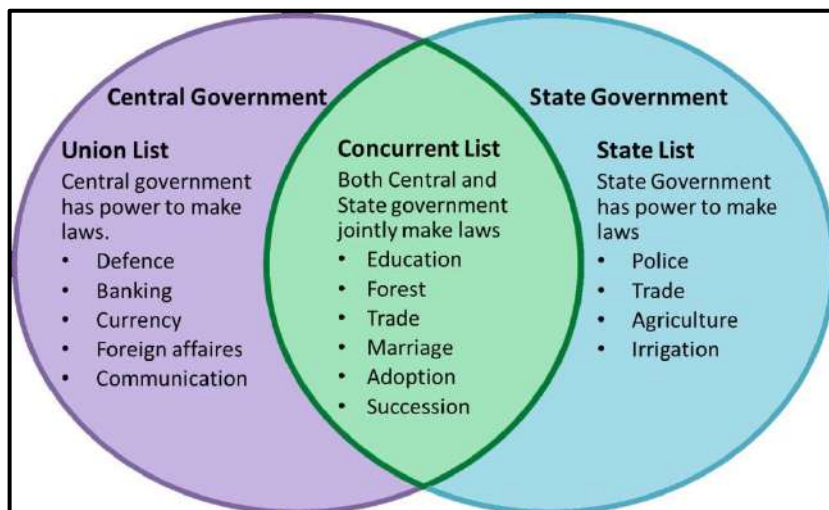
- **Federalism is a system of government in which the power is divided between a central authority and various constituent units of the country.**
 - Usually, a federation has two or more levels of Government, different tiers of Government Govern the Same Citizens, but each tier has its Jurisdiction in Specific matters of legislation, Taxation and Administration.
- Both these levels of government enjoy their power independent of the other.
- The judiciary has the power to interpret the Constitution and the Powers of different levels of Government.
- **Indian Constitution originally Provided for a two-tier System of Government:**
 - Union Govt or Central Govt and State Govt.
 - Later, the 3rd tier of federalism was added in the form of Panchayats and Municipalities by the 73rd Constitutional amendment and 74th constitutional amendment respectively.

Centre-State Relations

- It revolves around the balance of distribution of Powers between the Centre and States. There are 3 types of distributions:
 - Legislative Power Distribution
 - Executive Power Distribution
 - Financial Power Distribution
- **Legislative Relations**
 - Union Government Possess Powers over the entire territory of India while the States have jurisdiction over their territories.
 - Central Government has extra-territorial Jurisdiction which means that its laws govern not only Persons and Property within India but also Indian Citizens and their Properties located in any corner of the world.
 - ✓ The State legislatures do not Possess Jurisdiction outside their territory.
 - Constitution distributes the legislative Subjects between the Union Government and States:
 - ✓ Union list
 - ✓ State list
 - ✓ Concurrent list
 - **Residuary Powers:** Any Subject not mentioned in the above three lists will automatically Come under the Jurisdiction of the Union Government.
 - When President declares National Emergency the Parliament acquires the Powers to legislate over the Subjects in the State List.
 - Parliament has Powers of enactment on a State Subject to implement an **International Agreement**.
 - After the declaration of Emergency under Article 356 emergency in a State, Parliament Can enacts on State list Subjects for that State.
- **Executive Relations**
 - Union Government extends over the territory of India and the Union list while the Executive Power of the state governments extends over their territories and State list.
 - Union Government can entrust its functions to the State Government after getting the Consent of the State Government Concerned.
 - State Government can entrust its executive functions to the Union Government after getting the Consent of the Union Government.

Financial Relations

- Indian Constitution distributes financial Powers between the Union and States in a Comprehensive arrangement.
- There are two sources of revenue distributed by the Constitution namely "Tax Revenue and Non-tax Revenue".



Cooperative Federalism

- It is a **System that allows States to cooperate over a wide range of subjects to provide Citizens with Services at the lowest cost and best value goods.**
- It is a Concept where the Centre Competes with States and vice-versa, and States Cooperate, and the Ultimate aim is to develop India.
- States learn from each other to promote socio-economic development.**
- Freedom with States to plan their expenditure based on their priorities, State governments do not look towards the Centre for Policy guidance and Fiscal resources.

Concern

- Union passed several legislations that Weakening States' Autonomy**
 - The **farm laws** (now repealed).
 - Government of National Capital Territory Amendment Act, 2021**
 - Draft Electricity (Amendment) Bill, 2021.
- Enlarging the non-divisible pool of taxes by increasing cess on several goods.
- All States in the Indian Union do not have identical powers. Some States enjoy a special status

Steps to strengthen federalism

- Inter-State Commission should be formed** to Promote Cooperation among Central and State Governments.
- Transferring some of the residuary Powers of legislation and Taxation from the Union Government to the State Governments to empower the States.
- Making Finance Commission a Permanent body.**
- Article 356 must be imposed only as a measure of last resort when there is a complete breakdown of Constitutional machinery in a State.
 - All available and possible alternatives should be explored before the imposition of an Emergency.
- State Government must be consulted before the appointment of State Governors.
 - Politically active Persons and leaders should not be appointed as Governors.
- Adaptation of 3 language formulas to strengthen the unity and integrity of the Country.
- Cooperative Federalism provides a way for different groups of people in different parts of the country to live together and contribute to nation-building.

PANCH PRAN

GS-II GOVERNANCE

In News

- Addressing the country on the 76th Independence Day, the **Prime Minister** gave a call for setting big resolutions and spelt out "PanchPran" (five resolves) to fulfil the dreams of freedom fighters for the country by 2047, the centenary of Independence.
- Prime Minister also stated **that corruption, nepotism and misogyny are some of the big challenges that needed to be combated.**

Key Points of the Speech

- In the pursuit of Independence, the **entire period of slavery was spent in a struggle. No part of India or any time period remained untouched by the freedom struggle** against several centuries of slavery and marked by people sacrificing themselves facing torture and making supreme sacrifices.
- All the countrymen are deeply indebted to Pujya Bapu, Netaji Subhash Chandra Bose, Babasaheb Ambedkar, and Veer Savarkar, who devoted all their life to the path of duty toward the nation.

- The path of obligation has been their sole life path.
- This country is grateful to Mangal Pandey, Taty Tope, Bhagat Singh, Sukhdev, Rajguru, Chandrashekhar Azad, Ashfaqulla Khan, Ram Prasad Bismil and countless such revolutionaries of ours who shook the foundations of British rule.
- This nation is grateful to those brave women, be it Rani Lakshmibai, Jhalkari Bai, Durga Bhabhi, Rani Gaidinliu, Rani Chennamma, Begum Hazrat Mahal, VeluNachiyar, who showed their mettle of women power of India.
 - Every Indian is filled with pride while remembering the countless brave women who achieved the pinnacle of sacrifice.
- We cannot forget the contribution of our tribal society living in forests. There are countless names like BhagwanBirsu Munda, Sidhu-Kanhu, Alluri Sitarama Raju, and Govind Guru, who became the voice of the freedom movement and inspired my tribal brothers and sisters, mothers and youth in the remotest jungles to live and die for the motherland.
- Many great men like Narayana Guru, Swami Vivekananda, Maharishi Aurobindo, and Gurudev Rabindranath Tagore kept awakening the consciousness of India in every corner and every village of India and kept this consciousness alive.
- **On 14th August, India also remembered the deep wounds of Partition on 'Partition Vibhishika Memorial Day' with a heavy heart.**
- This journey of 75 years has been full of ups and downs. our countrymen have accomplished various achievements.
- India is the Mother of democracy, our India has proven to all that we have this invaluable strength.
- We must take up the responsibility of fulfilling **all the dreams of the freedom fighters by embracing those 'Panch Pran' by 2047 when the country celebrates 100 years of independence.**
 - The country to move ahead with a big resolve of a developed India.
 - We have to liberate ourselves from the slavery mindset which is visible in innumerable things within and around us.
 - We should feel proud of our heritage and legacy.
 - Unity and solidarity. Amongst 130 million countrymen when there is harmony and bonhomie, unity becomes its strongest virtue.
 - We must be responsible citizens and have a duty towards the nation.
- The 10% ethanol blending seemed like a very big dream. Old experiences showed that it was not possible, but the country has realized this dream of 10 % ethanol blending before time.
- Providing electricity connections to 2.5 crore people in such a short time was not a small task, but the country has done it.
- The country is rapidly providing 'water from the tap' to the homes of lakhs of families.
- Freedom from open defecation has become possible in India.
- Experience tells us that we can achieve our goals once we are determined. Be it the goal of renewable energy, the intention of building new medical colleges in the country or creating a workforce of doctors, the pace has increased a lot in every field.
- New National Education Policy has been formulated with a lot of brainstorming, with the exchange of ideas from various people and is at the root of the country's education policy. The skill that we have emphasized is such a power, which will give us the strength to be free from slavery.
- One of the dreams of a self-reliant India is to ensure that India does not lag in fulfilling the needs of the world. Even if it is the MSMEs we have to take our products to the world with 'Zero Defect - Zero Effect'.

LEGAL METROLOGY RULES 2011

GS-II GOVERNANCE

In News

- The Department of Consumer Affairs under the Ministry of Consumer Affairs, Food and Public Distribution has received several proposals for exempting loose or open garment sales from the Legal Metrology (Packaged Commodities) Rules 2011.
 - Legal Metrology (Packaged Commodities) Rules 2011 **regulate pre-packaged commodities and also impose certain labelling requirements on commodities.**
- Therefore, after assessing proposals the Department of Consumer Affairs **introduced the Legal Metrology (Packaged Commodities) (Third Amendment) Rules, 2022, which has exempted the garment industry from selling loose or open garments.**
 - The decision will promote **ease of doing business, reduce the compliance burden on industries** and declare the information relevant to consumers.

Related News

- Recently the Union Minister of Consumer Affairs suggested a pragmatic approach to balancing the interest of consumers with the need to simplify laws.
- The Minister has highlighted the **need to effectively implement laws to protect consumer interests without the harassment of businesses.**
- He suggested adopting a pragmatic approach to **decriminalizing laws and urged states to support the initiative to balance the interest of consumers with the need to simplify laws.**

- He said it is important to bring a transparent system so that people can do business with simplicity. Consumers should be encouraged to come forward with complaints to benefit society as a whole.

Consumer Protection Act, 2019

- **Consumer Protection Act, 2019** replaced the Consumer Protection Act, 1986, which was enacted to protect the interests of consumers.
- The Act defined a **consumer as a person who buys any goods or avails of service for final use.**
 - It does not include a person who buys a good for resale or a good or service for commercial purposes.
- It covers transactions through all modes including offline, and online.
- The Act clearly defined **6 Rights of consumers:**
 - Right to be protected against the marketing of goods and services which are hazardous to life and property.
 - Right to be informed about the quality, quantity, potency, purity, standard and price of goods or services.
 - Right to Choice among a variety of goods or services at competitive prices.
 - Right to be heard
 - Right to seek Redressal against unfair or restrictive trade practices.
 - Right to Consumer Awareness
- Central Consumer Protection Authority (CCPA) promotes, **protects and enforces the rights of consumers.**
 - It functions under the guidelines of The Minister of Consumer Affairs, Food and Public Distribution
 - It regulates matters linked to the violation of consumer rights, unfair trade practices, and misleading advertisements.
 - The CCPA has an investigation wing; they may conduct an inquiry or investigation into the case of violations of rules.
- **Central Consumer Protection Authority (CCPA) functions;**
 - Inquiring into violations of consumer rights, investigating and taking appropriate action.
 - It could pass orders to recall goods or withdraw hazardous services, and refund the price paid.
 - It Issues directions to the concerned trader/ manufacturer/ endorser/ advertiser/ publisher to either discontinue a false or misleading advertisement.
 - It imposes penalties on a manufacturer or an endorser of up to Rs 10 lakh and imprisonment for up to two years for a false or misleading advertisement. In case of a subsequent offence, the fine may extend to Rs 50 lakh and imprisonment of up to five years.
 - It Issues safety notices to consumers against unsafe goods and services.
- **Consumer Disputes Redressal Commissions (CDRCs) at the District, State, and national levels.**
 - Appeals from the State CDRC will be heard by the National CDRC.
 - The final appeal to the Supreme Court.
 - The District CDRC will entertain complaints where the value of goods and services does not exceed Rs 1 crore.
 - The State CDRC will entertain complaints when the value is more than Rs 1 crore but does not exceed Rs 10 crore.
 - Complaints with a value of goods and services over Rs 10 crore will be entertained by the National CDRC.

Provision	Consumer Protection Act, 1986	Consumer Protection Bill, 2019
Regulator	No Central Regulator	Central Consumer Protection Authority to be set up.
Filing of Complaint	A complaint needs to be filed in the consumer court under whom jurisdiction of the seller falls under	A complaint can be filed from anywhere or from where the consumer resides.
Mediation	No Provision	Courts can work towards settlement through mediation cells.
Jurisdiction	The jurisdiction at District level was complaints worth of Rs. 20 Lakh	District level authorities can take-up complaints with goods and services worth up to Rs.1 crore.
Product Liability	No Provision	Consumers have the right to seek compensation for any harm caused.
E-Commerce	No Provision	E-Commerce transactions will come under the provisions involving direct sales.
Video Conferencing	No Provision	Consumers can seek hearing through Video Conference.

MID-DAY MEAL SCHEME

GS-II SOCIAL JUSTICE

In News

- As per a study conducted by the Karnataka government, there is “clear evidence of significant improvement” in the growth of egg-eating children, with girls in Class 8 gaining up to 71% more weight than their peers who were not served eggs.
- The study revealed that the **Body Mass Index (BMI)** of children, both boys and girls, improved due to the introduction of eggs, and to some extent bananas.
- Currently, eggs are served in mid-day meals in 13 states and three UTs as part of “additional food items”, with the states/UTs picking the tab. The frequency ranges from five days a week to once a month.

Mid-Day Meal Scheme

- The Midday Meal Scheme is a school meal programme in India designed to better the nutritional standing of school-age children nationwide, under the Ministry of Education.
- The programme supplies free lunches on working days for children in primary and upper primary classes in government, government-aided, local body, Education Guarantee Scheme, and alternate innovative education centres, Madarsa and Maqtabas supported under SarvaShikshaAbhiyan, and National Child Labour Project schools run by the ministry of labour.
- Serving 120 million children in over 1.27 million schools and Education Guarantee Scheme centres, the Midday Meal Scheme is the largest of its kind in the world.
- The Midday Meal Scheme has been implemented in the Union Territory of Puducherry under the French Administration since 1930.
- In post-independent India, the Midday meal Scheme was first launched in Tamil Nadu, during the early 60s.
 - The government of India initiated the **National Programme of Nutritional Support to Primary Education (NP-NSPE)** on **15 August 1995**.
 - By 2002, the scheme was implemented in all of the states under the orders of the Supreme Court of India.
- The name of the scheme was changed to **PM-POSHAN (Pradhan MantriPoshan Shakti Nirman) Scheme**, in September 2021, by the Ministry of Education, which is the nodal ministry for the scheme.
 - The Central Government also announced that an additional 24 lakh students receiving pre-primary education at government and government-aided schools would also be included under the scheme by 2022.
- The Midday Meal Scheme is covered under the **National Food Security Act, 2013**.

The Parliamentary Committee report on Mid Day Meal Scheme

- A Parliamentary committee raised concern over the ‘under-utilization’ of funds under Mid Day Meal schemes, which are considered the “backbone of education” in the country.
- According to the report, out of the total allocation of Rs 40,576 crore under the Centrally Sponsored Schemes that come under the Department of School Education and Literacy, only Rs 23,572 crore was spent.
- The Department-related Parliamentary Standing Committee on Education, Women, Children, Youth and Sports has directed the Center to identify the factors behind the underutilization.
- The PM-Poshan scheme, under which cooked meals are provided to students in schools, officially covers 11.8 crore children in classes up to class VIII.

CONTINUATION OF PMAY-U

GS-II SOCIAL JUSTICE

In News

- The Union Cabinet has extended the Pradhan MantriAwasYojana (Urban) up to 31st December 2024, so that the sanctioned houses are completed.

Pradhan Mantri Awas Yojana

- The **Ministry of Housing and Urban Poverty Alleviation** launched **Pradhan Mantri Awas Yojana** in 2015.
- The Programme was initiated with the **objective of ‘Housing for All by 2022’**.
- Providing housing Facilities to rural poor and urban poor including slum dwellers
- Financial assistance is provided** to eligible beneficiaries for the construction of pucca houses.
- The **Centre and States share the Cost** of the houses made under the scheme.
- The mission has **2 Components**: Pradhan MantriAwasYojana (Urban) and Pradhan MantriAwasYojana (Rural).
- Pradhan MantriAwasYojanaGramin (PMAY-G) was formerly called the Indira AwasYojana and was renamed in March 2016.
 - It is targeted at promoting accessibility and affordability of housing for all of rural India with the exceptions of Delhi and Chandigarh.

• Pradhan Mantri Awas Yojana (Urban) Programme

- **In Situ Slum Redevelopment:** A slum rehabilitation grant of Rs. 1 lakh per house, on average, would be admissible for all houses built for eligible slum dwellers in all such projects. Slums so redeveloped should compulsorily be denotified.
- **Affordable Housing through Credit Linked Subsidy:** Under Credit Linked Subsidy, beneficiaries of Economically Weaker Section (EWS) and Low Income Group (LIG) can seek housing loans from Banks, Housing Finance Companies and other such institutions for new construction and enhancement of existing dwellings as incremental housing.
- **Affordable Rental Housing Complexes:** It will be a mix of single/double bedroom Dwelling Units and a Dormitory of 4/6 beds including all common facilities which will be exclusively used for rental housing for a minimum period of 25 years.
- **Aadhar Card is mandatory** to take benefit of the scheme.
- Economically weaker sections and Middle-Income Groups are also eligible for financial assistance under the Missions.
- **Priority is given to SCs, STs, OBSs, differently-abled persons, senior citizens, minorities, single women, transgender and other Socio-economic weaker sections of the society.**
- Identifying beneficiaries eligible for assistance and their prioritisation to be done using information from the Socio-Economic and Caste Census (SECC) ensures total transparency and objectivity.
- The ownership of houses is provided in the name of female members or joint names.
- **Houses made under the scheme would ensure basic facilities** like salutation, tap water connection, etc.
- Under the scheme, the Government promoted Training to Rural Masons under Rural Mason Training (RMT) programme to make a pool of trained rural masons available for faster construction of quality houses.

Objectives of Pradhan Mantri Awas Yojana

- To promote the empowerment of citizens, the Ownership of a house is one of the key indicators of socio-economic development.
- **They are ensuring Women's empowerment** through the Scheme, as the **ownership of the house is provided in the name of a female member or joint ownership.**
- **To Promote Cooperative Federalism, Autonomy is given to States/UTs** to decide the list of beneficiaries and adopt innovative methods to implement housing projects.

Present Status

- The Prime Minister has said that the Government has provided pucca houses to 2.5 crore families across the country — of these, 2 crore houses are in rural areas.
- To achieve the target of "Housing for All", the Union Government is implementing Pradhan Mantri Awaas Yojana.
- It aims to assist eligible rural households with an overall target to construct 2.95 crore pucca houses with basic amenities by March 2024.

SMILE 75 INITIATIVES

GS-II SOCIAL JUSTICE

In News

- The **Union Ministry of Social Justice and Empowerment has launched the 'SMILE-75' initiative.**
- The main objective of the scheme is to ensure **comprehensive rehabilitation of baggers in 75 identified municipalities as a part of the 75th year of Independence day celebrations.**
- The initiative is a part of the Ministry's ongoing SMILE project.

Details

- The Ministry of Social Justice and Empowerment has launched an **umbrella scheme "SMILE: Support for Marginalized Individuals for Livelihood and Enterprise" to cover several comprehensive measures including welfare measures for both transgender persons and persons who are engaged in the act of begging.**
- The Ministry allocated Rs 265 cr under Comprehensive Rehabilitation for Welfare of Transgender Persons, and Rs 100 cr under Comprehensive Rehabilitation of Persons engaged in the Act of Begging for the years 2021-22 to 2025-26.

About SMILE Scheme

- The Scheme aims to provide welfare and rehabilitation to the Transgender community and the people engaged in the act of begging.
- The 2 sub-schemes of SMILE are:
 - **Central Sector Scheme for Comprehensive Rehabilitation for Welfare of Transgender Persons.**
 - **Central Sector Scheme for Comprehensive Rehabilitation engaged in the act of Begging'.**

- It aims to **provide comprehensive welfare and rehabilitation measures to the Transgender community and the people engaged in the act of begging.**
- The scheme aims to ensure social security through multiple dimensions of identity, medical care, education, occupational opportunities and shelter.
- The Ministry has allocated Rs. 365 Crore for the scheme from 2021-22 to 2025-26.
- **It has provisions for Skill Development and Livelihood under the PM-DAKSH scheme.**

Expected Outcome of the Scheme

- Through **Composite, Medical Health** aims to provide a comprehensive package in convergence with PM Jan ArogyaYojna (PM-JAY) supporting Gender-Reaffirmation surgeries through selected hospitals.
- Providing **Housing facilities in the form of 'GarimaGreh'** to ensure food, clothing, recreational facilities, skill development opportunities, recreational activities and medical support etc. to the Transgender community and the people engaged in the act of begging.
- The **Provision of Transgender Protection Cell** in each state will monitor cases of offences and ensure timely registration, investigation and prosecution of offences.
- The **National Portal and Helpline** will provide necessary information and solutions to the Transgender community and the people engaged in the act of begging when needed.

Concerns

- **Transgender face numerous forms of discrimination and injustice, exclusion from participation in social and cultural life, education, and economic sphere, and political and decision-making processes.**
- Issues with Current legislations:
 - Discretionary powers to Police to arrest.
 - No distinction between beggars and the homeless.
 - Different definitions in different States.
- **The problem of beggary, like any other social problem, is multi-dimensional. Its roots are found in the diverse patterns of its intertwined and interlocked social fabrics.**
- According to an estimate, 3 lakh children across India are forced to beg, using everything from addiction to drugs, to threats of violence and actual beating.
- **In India, there is a lack of adequate provision for treatment and social rehabilitation of blind, deaf, dumb or physically handicapped. In the absence of any reasonable alternative, such persons are forced to beg.**
- Economic factors generally prompt people to take to begging. Among these factors poverty, unemployment, under-employment and loss of income are important.

Way forward

- **These are Social problems and have to be seen in a Holistic manner as there are numerous contributory factors such as poverty, unemployment, disability and migration.**
- Rehabilitate through rehabilitation Center, Setting up Counseling Committees to interact with them and assist them.
- **Sensitizing people and authorities, Coordination of stakeholders such as Civil Society, Government, media, police and Citizens are needed to end this.**
- As a progressive and developing society, we must respect the identity and dignity of all sections of society.
- The Ministry has ensured that every need of the Transgender community and persons engaged in the act of begging is taken care of in a most professional way.
- **The provision under the SMILE initiative will provide necessary information and solutions to the problems of the Transgender community and the people engaged in the act of begging.**

NAMASTE PROJECT

GS-II SOCIAL JUSTICE

In News

- The Union Ministry of Social Justice and Empowerment is in the process to **start a nationwide survey to list all people engaged in the hazardous cleaning of sewers and septic tanks.**
- The Ministry also highlighted that the practice of **manual scavenging no longer takes place in the country as all manual scavengers had been enrolled on the rehabilitation scheme.**

Details

- The Union Minister of State for Housing and Urban Affairs has announced the '**NAMASTE scheme**' for cleaning sewers and septic tanks.

- **NAMASTE (National Action Plan for Mechanized Sanitation Ecosystem) Scheme is a joint venture between;**
 - The Department of Drinking Water and Sanitation.
 - The Ministry of Social Justice and Empowerment.
 - The Ministry of Housing and Urban Affairs.
- **The main objective of the scheme is to ensure;**
 - Zero fatalities in sanitation work in India.
 - No sanitation workers come in direct contact with human faecal matter.
 - All Sewer and Septic tank sanitation workers have access to alternative livelihoods.
- **The Ministry has announced that;**
 - They have shortlisted the types of machinery and core equipment required for maintenance works and Safety gear for SafaiMitras.
 - Skill Development and training of SafaiMitras to be conducted with the help of the Ministry of Social Justice and Empowerment through the National SafaiKaramchari Finance Development Corporation.

Sanitation workers in India

- Despite the various laws, Sanitation workers in India constantly face stigma and are devoid of fundamental rights.
- During the 1990s, various civil societies started a movement to abolish dry latrines.
 - This movement has always demanded the abolition of the dehumanising practice of the manual removal of human excreta.
 - In the present time, the focus shifted to manhole deaths and the requirement of safety equipment for sanitation workers.
- **The Union government has enacted an Act in 1993, the act restrict the construction of unsanitary dry latrines and employing manual scavengers.**
 - With time, the construction of dry latrines has reduced, but the number of deaths in manholes, sewers and septic tanks continues to remain high.
- According to the data released by the Social Justice and Empowerment Ministry, a total of 971 people lost their lives while cleaning sewers or septic tanks since 1993, the year law prohibiting the employment of manual scavengers was passed.
- **The occupation of sanitation work is tied with the caste in India.** All kinds of cleaning are considered lowly and are assigned to people from the so-called lowest caste of the social hierarchy.
- Socio-Economic and Caste Census (SECC) released in 2015, states that there were around 18 million manual scavenging households in rural areas.
- Statistics show that 80% of India's sewage cleaners die before they turn 60, after contracting various infectious diseases.
- Data show the manual scavengers' reluctance to take up self-employment, even if they try to switch their job; they face social discrimination due to their caste.

Concern

- **Even though manual scavenging is banned in India, the practice is still prevalent in many parts of the country.**
- Only in 30% of cases of Compensation awarded after death, hardly anyone receives the Rehabilitation or Alternative jobs to which they are entitled by law.
- **Employers and local authorities are not providing Protective measures.**
- **When the Government builds toilets through its Swachh Bharat Abhiyan, it is not taking into account the question of who will have to clean the septic tank.**
- Rehabilitation has been Slow because they are mostly illiterate and have no Skill to do any work other than Sanitation related activities.
- **Most sanitation staff hardly has any ID cards, protection of medical insurance policies, etc.**
- The workers in sanitation departments are recruited through open competition. The local administration usually approaches particular cast members during such hiring.
 - The situation is so alarming that while we find volunteers to distribute food and undertake rescue operations during natural calamities, hardly any volunteer offers to do clean-up work or dispose of dead bodies.
- **There are no vehicles for sanitation workers to travel to their designated workplace, and they have to either walk for kilometres or use garbage vehicles.** This is forced choice and is connected to the dignity of a worker.
- There are **hardly any exclusive trade unions for sweepers**, and unlike other sections in the government or private workforce, their problems are expressed by mainly those who are not associated with sanitation work (Civil society or NGOs).
- Despite the laws, **manual scavenging was reported in many states.** In 2021, the National Human Rights Commission observed that the eradication of manual scavenging as claimed by state and local governments is far from over.

Steps by the Government

- Sanitation is a State subject as per the 7th Schedule.

- In 2013 Delhi announced that they were banning manual scavenging, making them the first state in India to do so.
 - District magistrates are responsible for ensuring that no manual scavengers are working in their district.
- "The Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993", drafted by the Ministry of Urban Development was passed by Parliament in 1993.
 - The act punishes the employment of scavengers or the construction of dry (non-flush) latrines with imprisonment for up to one year and/or a fine of Rs 2,000.
- In 2007 the Self Employment Scheme for Rehabilitation of Manual Scavengers was passed to help in the transition to other occupations.**
- The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act 2013.
- Prohibition of Employment as Manual Scavengers and their Rehabilitation (Amendment) Bill, 2020.
 - The Bill calls for complete mechanization of cleaning sewers and septic tanks.
- Safaimitra Suraksha Challenge was launched by the Ministry of Housing and Urban Affairs to make sewer cleaning mechanized.
- 'SwachhtaAbhiyan App' has been developed to identify and Geotag the data of insanitary latrines and manual scavengers so that the insanitary latrines can be replaced with sanitary latrines and rehabilitate all the manual scavengers to provide dignity of life to them.
- In 2014, the Supreme Court order made it mandatory for the government to identify all those who died in sewage work since 1993 and provide Rs. 10 lakh each as compensation to their families.**

Way Forward

- India's Supreme Court has ruled that the practice of manual scavenging violates international human rights law, including protections found in the Universal Declaration of Human Rights (UDHR), the International Convention on the Elimination of All Forms of Racial Discrimination (ICERD), and the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW).
 - India is also a party to other international conventions that reinforce obligations to end manual scavenging.
- Article 21 of the Constitution guarantees the Right to Life and that also with dignity.
- Need to ensure proper implementation of the Self Employment Scheme for Rehabilitation of Manual Scavengers, and promote Alternative opportunities or Jobs.
- Ensure that rehabilitation entitlements under the 2013 Act—including financial assistance, scholarships, housing, alternative livelihood support, and other important legal and programmatic assistance—are available to manual scavenging communities.**

HEALTH INSURANCE FOR TRANSGENDERS

GS-II SOCIAL JUSTICE

In News

- The Union government has announced the **provision of health insurance of Rs 5 lakh to each Transgender person under the Ayushman Bharat scheme.**
 - The insurance policy will **also cover sex change surgeries.**
 - The health Id-cards issued to transpersons will not cover their family members.
- According to the official data, there are nearly 4.8 lakh eligible transgender persons under the scheme.

Ayushman Bharat Scheme

- The Prime Minister of India has launched Ayushman Bharat-Pradhan Mantri Jan Aarogya Yojana (AB-PMJAY) in 2018.
- It is the **"world's largest government-funded healthcare program"** targeting nearly 10 crore poor and vulnerable families (approximately 50 crore beneficiaries).



- Coverage of 5 lakh for each family, **(no restriction of family size)**.
- Under the scheme, **every eligible family would get health insurance coverage up to 5 lakh rupees per family per year for secondary and tertiary care hospitalization.**
- Recently the government launched Ayushman Bharat Digital Mission (ABDM) to create a National Digital Health ecosystem that supports universal health coverage in an efficient, accessible, inclusive, affordable, timely and safe manner.

Related News

- **The Ministry of Social Justice and Empowerment has launched an umbrella scheme “SMILE: Support for Marginalized Individuals for Livelihood and Enterprise” to cover several comprehensive measures including welfare measures for both transgender persons and persons who are engaged in the act of begging.**

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ATROCITIES AGAINST SCS/STS

GS-II SOCIAL JUSTICE

In News

- A Class 7 Dalit boy was allegedly beaten by his school teacher after that the student fell unconscious.
 - Several Dalit organisations protested against the teacher and school management and following that the accused teacher was taken into custody.
- Recently, **a nine-year-old Dalit student was allegedly beaten by a teacher** for touching a pot in the school, the child died during treatment.

Related News

- The Union **Ministry of Home Affairs** has expressed serious concern over the increasing trend of crimes against the oppressed sections, especially Dalits.
- The Ministry of Home Affairs (MHA) has issued **an advisory to the States/Union Territories** for identifying areas prone to atrocities against Dalits.
- The Ministry has also suggested **deploying adequate manpower/infrastructure to safeguard the life and property** of the Scheduled Castes/Scheduled Tribes.
- The guidelines have also highlighted the need for strong enforcement of the statutory provisions and laws relating to offences against SC/ STs.

Dalits in India

- According to the **data released by the National Crime Records Bureau.**
 - Crimes against scheduled tribe (ST) communities increased by 9.3% to a total of 8,272 cases registered in 2020.
 - Crime against Scheduled caste (SC) communities increased by 9.4% to a total of 50,291 cases registered in 2020.
- They **face Social discrimination in their day-to-day life**, which in turn limit their Education, health, economic opportunities, liberty, freedom, etc, and **erode their chance to live a life of dignity**, as they face different kind of stereotype like in case of theft, crime, etc they came in the circle of doubt and were also arrested by police.
- Many people hide their caste identity by adopting a different name, or title, or they migrate to another place and start a new life by hiding their caste identity, by doing this they can save themselves from social discrimination and lead a life of dignity, and take benefit of economic opportunities and improve the standard of living.
- India is a democratic country; **governments at every stage have tried to readdress these discriminations and ensured certain rights and protection** for different groups of people, provided equal opportunities to all citizens, and also prohibited any kind of discrimination based on religion, caste, gender etc.
 - Through Constitutional equality, they provided all people with the same level of opportunities and a proper mechanism to get justice.
- They mainly face **violence due to their so-called lower caste status in the social Caste System hierarchy.**

Steps taken to ensure socio-economic equality for Dalits, and other marginalized sections of the society.

- **Article 17** of the Indian Constitution abolishes Untouchability.
- **Article 46** requires the State 'to promote with special care the educational and economic interests of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes, and to protect them from social injustice and all forms of exploitation.
- **Article 335** provides that the claims of the members of the Scheduled Castes and the Scheduled Tribes shall be taken into consideration, consistently with the maintenance of efficiency of administration, in the making of appointments to services and posts in connection with the affairs of the Union or a State.
- **Article 15(4)** refers to the special provisions for their advancement.
- **Article 16(4A)** speaks of "reservation in matters of appointment/promotion"
- **Article 338** provides for a National Commission for the Scheduled Castes and Scheduled Tribes with duties to investigate and monitor all matters relating to safeguards provided for them.
- **Article 330 and Article 332** of the Constitution respectively provide for reservation of seats in favour of the Scheduled Castes and the Scheduled Tribes in the House of the People and the legislative assemblies of the States.
- **Under Part IX of the Indian Constitution** relating to the Panchayats and Part IXA of the Constitution relating to the

Municipalities provides reservation for Scheduled Castes and Scheduled Tribes in local bodies.

- The Ministry of Social Justice & Empowerment is the nodal Ministry to oversee the interests of the Scheduled Castes.
 - The Scheduled Castes Development (SCD) Bureau promotes the welfare of Scheduled Castes through their educational, economic and social empowerment.
- Pre-Matric Scholarships.
- Scholarships for obtaining Higher Education and Coaching Scheme.
- The **Protection of Civil Rights Act, of 1955** was enacted to provide punishment for the practice of untouchability.
- Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989.
- Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Rules, 1995.
- Enactment of "Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993.
- The 'Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013'.

Way forward

- In democratic Societies there is nothing to legally stop a Person from the most deprived Class and Caste from reaching the highest Position, but these legal rights also need socio-economic support from the government as affirmative action.
- **Education can play an important role in reducing caste rigidity in our society.**
- Governments need to take effective affirmative action based on strong data to ensure the socio-economic development of marginalized people living at the bottom of the social hierarchy.
- People also need to understand that our Sources of knowledge about the past and especially the ancient Past are inadequate. It is difficult to be very certain about what things were like at that time, or the reasons why some institutions and Practices came to be established.
 - But even if we knew all this, just because something happened in the Past or is Part of our tradition, it is not necessarily right or wrong forever.
 - Every age has to think afresh about such questions and Come to its own Collective decision about its Social institutions.
- Discrimination is an evil present in every society, which limits the political, social, economical, and cultural opportunities of people and promotes a sense of insecurity among them stereotypes pushing them to that limit where they see violence as the only option to fight against discrimination.
- Therefore, it is **necessary for all the society to get rid of this evil, to create a sustainable peaceful and tolerant society, where everyone could equally contribute in Nation building.**



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AIR 9
PREETAM KUMAR



AIR 29
BHAVISHYA



AIR 43
SHUBHAM SHUKLA



AIR 44
ANJALI SHROTRIYA



AIR 50
ABHIJIT RAY



AIR 93
DEEPESH KUMARI

AIR 102 PREAKAR
AIR 107 PANKAJ
AIR 137 RISHABH
AIR 152 NISHA
AIR 158 RAJ
AIR 180 SHRISTI
AIR 186 SAMBHA
AIR 211 LALITHA
AIR 220 GARIMA
AIR 228 ANVANI
AIR 229 ABHITA
AIR 232 BEWA
AIR 240 UTSAV
AIR 269 ANUP
AIR 300 SHIVANI
AIR 319 GAJANANI
AIR 324 AIT
AIR 325 KANISHK

AIR 355 PREETIKA
AIR 379 ANURAG
AIR 439 KESHAV
AIR 469 SASHI
AIR 494 ABHINANDAN
AIR 497 SHUBHAM
AIR 534 SUJATA
AIR 541 RITESH
AIR 590 RAJESH
AIR 621 RAJNISH
AIR 622 RAJESH K.
AIR 636 SHANTANU
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AIR 650 DHARAVATHI
AIR 658 SARAVATHI
AIR 673 B.S. AREENA

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APTI PLUS has played a very important role in my UPSC journey. I would like to thank the faculty for their guidance and advice. I will always be grateful to them. Thank you **APTI PLUS**.

GOPAL K. RONANKI
AIR 3-UPSC CSE 2016



Thank you for all the help and guidance from the teachers of **APTI PLUS**. The journey has been long and required constant encouragement. So, I say thank you. All the best to all students at **APTI PLUS**.

MISS SUPRIYA DAS
AIR 236-UPSC CSE 2016



Thank you **APTI PLUS** Shubham and it's faculty for all its guidance and help during the journey of UPSC Exam. Its Faculty Members & materials have helped me crack this tough and prestigious examination.

MANORANJAN BEHERA
AIR 226-UPSC CSE 2017



I really thank the entire staff of **APTI PLUS** Academy who actually helped me a lot during my Mains preparation as well as interview preparation. I found the test series very pertinent. I want to wish all the best to **APTI PLUS** Academy.

JUBIN MOHAPATRA
AIR 46-UPSC CSE 2020



APTI PLUS Academy helped me a lot during UPSC preparation in different stages. I want to thank all faculty members of **APTI PLUS** for their guidance and support during my journey ranging from study materials to guidance and lectures.

ARPIT JAIN
AIR 279-UPSC CSE 2020



I have secured AIR 43 in 2021. I have been part of their mains answer writing which was top notch. I was also part of their interview program which helped me score a 197 in my interview. I am really thankful to **APTI PLUS**.

SHUBHAM SHUKLA
AIR 43-UPSC CSE 2021



I would strongly recommend **APTI PLUS** to their guidance and entry for mains, officer rank interview and help me immensely. Once I faced the IAS Gesta magazine a great experience for current affairs compilation. Supr. Sahoo Sir was very cordial who made my experience with **APTI PLUS** very positive. A big applause.

ABHIJIT RAY
AIR 50-UPSC CSE 2021

CHINA TAIWAN ISSUE**GS-II INTERNATIONAL RELATIONS****Context**

- As US House Speaker Nancy Pelosi arrived in Taiwan, upsetting China, India was keenly watching the developments, although it has not yet commented on it.

Background

- Although largely unrecognised by other countries as such, **self-ruled Taiwan sees itself as no less than an independent nation, and its leaders, including the fiercely pro-independence President Tsai Ing-wen, have vowed to defend its sovereignty against the Chinese goal of “reunification”.**
- But Taiwan is entirely dependent on the US for its defence against possible Chinese aggression — and that is why every spike in military tensions between China and Taiwan injects more hostility in the already strained relationship between Washington and Beijing.
- Taiwan, earlier known as Formosa, a tiny island off the east coast of China, is where Chinese republicans of the Kuomintang government retreated after the 1949 victory of the communists — and it has since continued as the Republic of China (RoC).**
- The island is located in the East China Sea, to the northeast of Hong Kong, north of the Philippines and south of South Korea, and southwest of Japan.
- What happens in and around Taiwan is of deep concern to all of East Asia.
- Taiwan observes October 10 — “double 10” — as its national day; it was on this day in 1911 that sections of the Manchu army rose in rebellion, leading ultimately to the overthrow of the Qing dynasty and the end of 4,000 years of the monarchy.**
- The RoC was declared on December 29, 1911, and it found its feet in the 1920s under the leadership of Dr Sun Yat-sen, founder of the Kuomintang (KMT) Party.
- Sun was succeeded by General Chiang Kai-shek, whose actions against the Chinese communists, who were part of an alliance with the KMT, triggered the civil war that ended in victory for the communists and retreat of Chiang and the KMT to Taiwan.
- Since its founding in 1949, the PRC has believed that Taiwan must be reunified with the mainland, while the RoC has held out as an “independent” country.
- The RoC became the non-communist frontier against China during the Cold War, and was the only ‘China’ recognised at the UN until 1971. That was when the US inaugurated ties with China through the secret diplomacy of Henry Kissinger, national security adviser to President Richard Nixon.**
- The US backs Taiwan’s independence, maintains ties with Taipei, and sells weapons to it — but officially subscribes to PRC’s “One China Policy”, which means there is only one legitimate Chinese government. Just 15, mostly very small, countries recognise Taiwan.
- Starting from the 1990s, and despite the missile crisis, relations between the PRC and RoC improved, and trade ties were established. As the British prepared to exit Hong Kong in 1999, the “One China, Two Systems” solution was offered to Taiwan as well, but it was rejected by the Taiwanese.
- In 2000, Taiwan got its first non-KMT government, when the Taiwanese nationalist Democratic Progressive Party (DPP) won the presidency.
- In 2004, China started drafting an anti-secession law aimed at Taiwan; trade and connectivity, however, continued to improve.
- The 2016 election of President Tsai marked the onset of a sharp pro-independence phase in Taiwan, and the current tensions with China coincided with her re-election in 2020.
- Taiwan now has massive economic interests, including investments in China, and pro-independence sections worry that this might come in the way of their goals. Inversely, the pro-reunification sections of the polity, as well as China, hope that economic dependence and increasing people-to-people contacts will wear out the pro-independence lobbies.**

Challenge for the US

- As tensions rise, the world is watching the US, whose status as the world’s pre-eminent power has been dented by the messy exit from Afghanistan.
- In East and Southeast Asia, several countries including Japan, South Korea, and the Philippines, which are sheltered under the protective umbrella of the US, are reading the tea leaves.**
- President Joe Biden has so far walked a thin line between pledging support for Taiwan, and keeping the lid on tensions with Beijing.**
- China and US had agreed to abide by the “Taiwan Agreement”, under which US support for the “One China Policy” is premised on Beijing not invading Taiwan.

- The AUKUS pact among the US, UK, and Australia, under which Australia will be supplied with nuclear submarines, has imparted a new dimension to the security dynamics of the Indo-Pacific. Taiwan has welcomed the pact, while China has denounced it as seriously undermining regional peace.

Implications for India

- With India facing its own problems with China at the LAC, there have been suggestions that it should review its One China Policy – it has in any case long stopped reiterating this officially – and use not just the Tibet card, but also develop more robust relations with Taiwan to send a message to Beijing.
- India and Taiwan currently maintain “trade and cultural exchange” offices in each other’s capitals.
- In May 2020, the swearing-in of Tsai was attended virtually by MPs.
- In 2016, New Delhi had dropped plans to send two representatives for Tsai’s first inaugural at the last minute.
- Bloomberg has reported that talks with Taipei are ongoing to bring a \$7.5-billion semiconductor or chip manufacturing plant to India.

PORCUPINE STRATEGY

GS-II INTERNATIONAL RELATIONS

Context

- China launched aggressive and unprecedented military exercises near Taiwan in response to US House Speaker Nancy Pelosi’s visit to the island that Beijing claims as part of its territory. As the long-range, live-fire drills began with China’s Eastern Theatre Command firing several ballistic missiles, Taiwan said that it was “preparing for war without seeking war”.

The “porcupine doctrine”

- The “porcupine doctrine”, which was proposed in 2008 by US Naval War College research professor William S Murray, is a strategy of asymmetric warfare focused on fortifying a weak state’s defences to exploit the enemy’s weaknesses rather than taking on its strengths.
- It is about building defences that would ensure that Taiwan “could be attacked and damaged but not defeated, at least without unacceptably high costs and risks”, Murray wrote in the Naval War College Review.
- There are three defensive layers in the porcupine approach.
 1. The outer layer is about intelligence and reconnaissance to ensure defence forces are fully prepared.
 2. Behind this come plans for guerrilla warfare at sea with aerial support from sophisticated aircraft provided by the US.
 3. The innermost layer relies on the geography and demography of the island.
 4. The ultimate objective of this doctrine is that of surviving and assimilating an aerial offensive well enough to organise a wall of fire that will prevent the Chinese People’s Liberation Army (PLA) from successfully invading.
- While the outer surveillance layer would work to prevent a surprise attack, the second one would make it difficult for China to land its troops on the island in the face of a guerrilla campaign at sea using “agile, missile-armed small ships, supported by helicopters and missile launchers.
- Even once Chinese boots were on Taiwanese ground, the island’s mountainous topography and urbanised environment would give defenders an advantage when it comes to hampering the progress of an invasion.

Asymmetric systems of defence

- In its 2021 Quadrennial Defence Review, Taiwan’s Ministry of National Defence defined asymmetric systems as ones that are “small, numerous, smart, stealthy, mobile and hard to be detected and countered”, and “associated with innovative tactics and employments”.
- According to Taiwan’s former Chief of the General Staff Admiral Lee Hsi-ming, these systems are “a large number of small things”.
- Among Taiwan’s current and yet-to-be-delivered military systems, “the minelayer ship, the Harpoon coastal defence cruise missile, the Stinger man-portable air defence missile, and possibly the missile corvettes can be considered ‘small things’ that can be fielded in large numbers”.
- These asymmetric capabilities will be aimed at striking the “operational centre of gravity and key nodes of the enemy”.
- Taiwan underlined its shift to an asymmetric approach by adopting the Overall Defence Concept (ODC) in 2018. The ODC was developed and introduced during the tenure of Admiral Lee, who served from 2017 to 2019.
- The ODC is Taiwan’s current strategy for dealing with a potential Chinese invasion in a resource-constrained environment” while using its “natural advantages, civilian infrastructure and asymmetric warfare capabilities”.
- These asymmetric systems must be cost-effective, easy to maintain, and numerous to disperse at strategic points.
- Missile strikes, cyberattacks, air and naval blockade aside, undertaking a full-scale invasion across the Taiwan Strait, with attendant risks of anti-ship and anti-air attacks, could present challenges for China

INDIA MALDIVES AGREEMENTS

GS-II INTERNATIONAL RELATIONS

Context

- Maldives President Ibrahim 'Tbu' Solih arrived in Delhi for a bilateral visit, amid rows within his government over ties with India, the Yoga Day attack, and a bitter row with Maldivian Speaker, former President and party colleague Mohammad Nasheed.

More on the news

- The Maldives **signed a cyber security agreement** with India as both sides affirmed bilateral will to strengthen ties to take on "transnational crimes and terrorism" in the Indian Ocean region.
- Prime Minister Narendra Modi and Mr. Solih participated remotely in the **pouring of the first concrete of the Greater Male Connectivity Project (GMCP)** that would include a 6.74 km bridge and the causeway linking capital Male with the neighbouring islands. The \$500 million project is being financed by India.
- India also **extended a \$100 million new Line of Credit** to finance infrastructure projects in the Maldives.
- In his remarks, **Mr. Solih referred to India as the "highest priority" of the Maldives**
- To strengthen Maldivian maritime capacity, **India has announced the gifting of a second landing assault craft to the Maldives National Defence Force.**

India-Maldives bilateral Relations

- India and Maldives are neighbors as they share a maritime border. Relations have been friendly and close in strategic, economic and military cooperation. India continues to contribute to maintaining security on the island nation.

Historical relations

- Both nations' were Britain colonies.
- India was among the **first to recognise Maldives after its independence in 1965** and to establish diplomatic relations with the country. India established its mission at Malé in 1972.
- India and Maldives share ethnic, linguistic, cultural, religious and commercial links steeped in antiquity and enjoy cordial and multi-dimensional relations.

Political relations

- India and Maldives have consistently supported each other in multilateral fora such as the **UN, the Commonwealth, the NAM and the SAARC.**
- High connectivity:** High People-to-People contacts, as Air India operates daily flights to Malé from Thiruvananthapuram, Bangalore and Chennai.
- Tourism:** The proximity of location and improvements in air connectivity in recent years has led to a very substantial increase in the number of Indians visiting Maldives for **tourism** (around 33,000) and business.
- Soft diplomacy:** India is a preferred destination for Maldivian for **education, medical treatment, recreation and business.**
- Diaspora:** Indians are the **second largest expatriate community in the Maldives.**

Why Maldives matters to India?

- Strategic location:** Maldives holds strategic importance for India under the Modi government's '**Neighborhood First**' policy due to its location in the Indian Ocean.
- The **Eight Degree Channel** is one of the major maritime lanes of the world.
- Stability, maturity and democratic system** in the Maldives can ensure peace and security in the Indian Ocean.

Major challenges

Chinese influence

- India has been quite apprehensive of the growing Chinese influence in Maldives even as it continues to give utmost priority to the island nation.
- There have been growing concerns regarding China's role in the Maldivian economy through so-called "**debt-trap diplomacy.**"
- Maldives incurred a debt of about **\$1.4 billion** owing to loans from China to finance several of its infrastructure projects.
- Maldives and China had also entered into a **free trade agreement.**

India's position in Male crisis

- During the pro-Beijing regime of their former President Abdulla Yameen, ties between the nations got strained. In fact, there came a point in 2018 when **India even contemplated a military intervention.**

Dhruv controversy

- India gave **two Dhruv Advanced Light Helicopters (ALF) to the Maldives in 2010 and 2015** both of which were to be used for ocean search-and-rescue operations, maritime weather surveillance and for airlifting patients between islands.
- However, some people in the PPM stirred up a controversy by saying that the **helicopters marked the start of military presence in the country.**
- The Maldives government requested India to take back the helicopters in 2016, but **India refused to do**

Lack of transparency

- Another issue is the lack of transparency when it comes to the **signing of agreements between India and the Solih government.**
- The Maldives government has refused to share details of agreements signed with India citing **security reasons**

The Naval Base controversy

- The **Uthuru Thilafalhu** is a **strategically located atoll** near the capital Malé and was called the **UTF Harbour project.**
- Also, in 2016, an action plan was signed by both the governments for defence cooperation to enhance "shared strategic and security interests of the two countries in the Indian Ocean region".
- However, after the Solih government took over, there was speculation that the UTF project would be turned into an Indian naval base.

Measures taken so far

- After coming to power for the second time in May last year, Prime Minister Modi's first international destination was Maldives. He was also the **only head of state to attend Maldives President Ibrahim Mohamed Solih's** swearing-in ceremony in November 2018, when he came to power ousting Yameen.
- India has also **offered a \$1.4-billion development assistance package to Maldives**, which is being utilised in several projects.
- 30 years ago, in 1988, an intervention by the Indian armed forces - codenamed '**Operation Cactus**' - trounced an attempted coup on the island nation. On November 3, 1988, when mercenaries attacked the Maldives, India was the first to respond.
- In 2004, when the tsunami hit Maldives, Indian naval ships were dispatched to assist rescue operation.
- During the **Male water crisis**. Within four hours Indian Navy and Air Force vessels delivered water.

Way forward

- Past learnings:** Despite repeated calls for intervention, India firmly avoided military action against the Yameen regime. New Delhi thoughtfully coordinated its diplomatic response with other stakeholders, and put enormous pressure on Yameen to hold the presidential elections in a fair and transparent manner. This patience seems to have yielded a positive outcome as India finds itself in an advantageous situation now.
- Cautious approach:** India needs to remain careful if it wants to avoid a Nepal-like situation, where New Delhi's perceived interference in Nepal's internal affairs had turned the Nepali people against India. Having a lighter diplomatic footprint is the only way forward in the Maldives.'

INDIA-UK FREE TRADE AGREEMENT

GS-II INTERNATIONAL RELATIONS

Context

- India and the United Kingdom concluded the fifth round of talks for an India-UK Free Trade Agreement (FTA). **Aim is to finalise a free trade agreement (FTA) to double bilateral trade by 2030.**

What is an FTA?

- An FTA is an **agreement** between two countries wherein it allows **free flow of goods and services** to and from both sides, **removing all tariff barriers** to boost trade with one another.

Which country does the U.K. have an FTA with?

- After Brexit (U.K. coming out of European Union), and Britain can now sign trade pact with other nations.
- U.K.-Australia FTA:** U.K. signed an FTA with Australia on December 17, 2021, eliminating almost 99% of tariff on both sides, allowing free flow of goods between the two countries. This pact will help Britain access the Pacific Rim through the **Comprehensive and Progressive Trans-Pacific Partnership.**
- Comprehensive and Progressive Trans-Pacific Partnership is an 11-nation trade conglomerate including Australia.

What does it mean for India?

- Brexit paved the way for Britain to freely and comprehensively negotiate a new free mega trade deal with India.
- The **£1 billion investment and commercial trade deal** India signed with Britain on May 4.

- India's trade would see a quantum jump when the free trade pact is signed, from £23.3 billion through an Enhanced Trade Deal to £50 billion post-FTA.
- With India set to becoming the world's third largest economy by 2050, India would become the U.K.'s most preferred partner.

What is India seeking from the U.K.?

- Removing all trade bottlenecks.**
- Green trade:** India is also seeking cooperation from Britain to **reduce its carbon footprint by 45%** and promoting green energy.

What are the sectors that will benefit?

- Agriculture:** The second Green Revolution, aimed at increasing food production in India to 400 million tonnes in the next 15 years, is led by plant ecology scientist Howard Griffiths of Cambridge University under **Transforming India's Green Revolution by Research and Empowerment for Sustainable food Supplies (TIGR2ESS)** would strengthen alliance between Indian and British experts in social policy and science, hydrology and crop science.
- Education:** India would allow more U.K. universities to open their branches in the subcontinent after the FTA.

ISRAEL PALESTINE CEASEFIRE

GS-II INTERNATIONAL RELATIONS

Context

- Israel and Palestinian militants in the Gaza Strip were exchanging fire, in the worst bout of cross-border violence since an 11-day war between Israel and Hamas last year.

Background

ISRAEL PALESTINE CONFLICT TIMELINE	
1799	Napoleon offers Palestine as a home to the Jews.
1882	Rishon Le Zion, a major Zionist settlement is established in Palestine.
1885	The term Zionism is first coined.
1897	First Zionist congress is held in Switzerland and first Zionist organization is founded.
1916	Sykes-Picot agreement is signed dividing middle east between French and British.
1917	Balfour declaration is created. Britain promises a Jewish national home on Arab land.
1919	King-Crane Commission on the future of Palestine.
1922	League of Nations gives approval to British promises.
1929	Al-Buraq uprising, the first mass protests against increased Jewish migration.
1935	Peel Commission recommends partition of Palestine.
1947	UN adopts Resolution 181, a partition plan for Palestine into separate Jewish and Arab states which Palestine rejects.
1948	The state of Israel is created.
1949	First Arab-Israeli war and Israel seizes more land than agreed in armistices. Gaza strip is created. UN establishes UNRWA.
1950	Jordan assumes control of the West Bank.
1964	Palestine Liberation Organisation (PLO) is formed.
1967	6-day war and Israel occupies rest of Palestine including West Bank, Gaza Strip, Golan Heights (Syria), Sinai (Egypt). UNSC calls on Israel to withdraw from these areas.
1978	Egypt and Israel sign the Camp David accords
1987	First Intifada is launched in occupied Palestine territory.
1991	Madrid Peace Conference ends.
1993	Oslo Accord Signed. Palestine and Israeli leaders sign a Declaration of Principles in Washington. Here the PLO is recognized by Israel and given some powers in Gaza. The PLO recognizes Israel's right to exist. Violence is stopped. They agreed on a plan to implement a two-state solution as part of the Oslo Accords, leading to the establishment of the Palestinian Authority (PA).
2000	Camp David II Summit where Israel and PLO renew final status negotiations.
2002	Israel reoccupies Palestinian cities in West Bank in the wake of 2nd Intifada.
2005	Israel agrees to withdraw from Gaza but maintains control of airspace and some imports/exports while restricting some travel.
2008	Israel invades Gaza in Operation Cast Lead.
2014	50-day conflict over the summer in Operation Protective Edge after more rockets are launched at Israel. Israel invades

	Gaza again.
2017	U.S. announces decision to relocate the U.S. embassy to Jerusalem, recognizing the city as Israel's capital.

Key Terms

- **Fatah and Hamas**
- Fatah is the largest faction of the Palestine Liberation Organization closely identified with the leadership of its founder Yasser Arafat. Hamas is a Palestinian Sunni-Islamic fundamentalist organization.
- In the 2006 parliamentary election, Fatah lost its majority in the Palestinian parliament to Hamas.
- This led to a conflict between Fatah and Hamas, with Fatah retaining control of the Palestinian National Authority in the West Bank, while Hamas dominated Gaza.
- Both are pledged to restore to Islamic rule the whole of Mandate Palestine.
- Their fundamental disagreement is over the strategy for achieving this common purpose, i.e Fatah believes more in peaceful process, whereas Hamas wants to resort to violence.
- **First Intifada:** Palestinians living in the West Bank and the Gaza Strip fomented the riots begun in 1987, known as the first intifada.
- **Madrid Conference of 1991** was a peace conference co-sponsored by the United States and the Soviet Union. It was an attempt by the international community to revive the Israeli-Palestinian peace process through negotiations, involving Israel and the Palestinians as well as Arab countries, including Jordan, Lebanon and Syria.
- **Oslo Peace Accord:** With the mediation of US and Russia in 1993, Israel and PLO signed the Oslo Peace accord which was based on the concept of two-state solution.
- **Camp David Summit (2000):** It aimed to help the two sides finally agree on a settlement, but the talks eventually failed. The violence led to the Second Intifada.
- **Second Intifada (2000-05):** In 2000, a more violent Palestine Uprising started and a large number of civilians died on both sides.
- **Gaza Expulsion plan (2005):** This is a unilateral disarmament plan by Israel by which Israel's defence forces leave the Gaza strip and four settlements in the northern West Bank.

India's Stand on Palestine-Israel Conflict

- India has consistently supported the legitimate right of the Palestinian people to a State and the consequent imperative need for a just, comprehensive and lasting peace in the region based on United Nations Security Council resolutions as well as the principle of "Land for Peace."

1936	Congress working committee sent greetings to Palestine and on 27th September first observed Palestine day.
1939	Session of INC adopted a resolution on Palestine and looked forward to the emergence of an Independent democratic state in Palestine in which Jews rights would be protected. India was the member of UN special committee on Palestine.
1974	India became the first non - Arab country to recognize the Palestine Liberation Organization (PLO) as the sole and legitimate representative of the Palestine people.
1980	GOI announced in Parliament India's decision to accord full diplomatic recognition to the PLO office in New Delhi. It was after this that Yasser Arafat paid a three day visit to India, during which he described India as an 'eternal friend'.
1988	India recognized Palestine as a state. Indian Government has constructed the Palestine embassy building in New Delhi, as a gift of the people and GOI to the Palestine people.
2014-15	India favored UNHRC's resolution to probe Israel's human rights violations in Gaza. Despite supporting probe, India abstained from voting against Israel in UNHRC IN 2015.
Until 2017	India's position was that it supported "the Palestinian cause and called for a negotiated solution resulting in a sovereign, independent, viable and united State of Palestine, with East Jerusalem as its capital, living within secure and recognised borders, side by side at peace with Israel".
2018	India de-hyphenated its relationship with Israel and Palestine as part of its West Asia policy to treat both the countries mutually independent and exclusive.
2019	India voted in favor of a decision introduced by Israel in the UN Economic and Social Council (ECOSOC) that objected to granting consultative status to a Palestinian non-governmental organization
2020	India asked Israel and Palestine to resolve issues between them through direct negotiations and engage with each other to find an acceptable "two-states solution" for peaceful coexistence.
2021	At the UNSC meet recently, India reaffirmed its support for Palestine, but stopped short of making any direct reference to the status of Jerusalem or the future Israel-Palestine borders.

Way Forward

- Both Israel and Palestine should **immediately resume the peace talks under the guidance of the UNSC**.
- Further **any successful peace initiative** would need to resolve the four core issues: **West Bank borders/settlements, Israeli security, Palestinian refugees, and Jerusalem**.
- There must be **proper adherence to UNSC resolution 2334** which states that Israel's settlement activity has no legal validity and demands that it stop such activity.
- India should **counsel Israel to exercise restraint and move towards a two-state solution**.
- The **best solution is a "two-state solution"** that would establish Palestine as an independent state in Gaza and most of the West Bank, leaving the rest of the land to Israel.

INDIA-BANGLADESH ANNUAL DEFENCE DIALOGUE

GS-II INTERNATIONAL RELATIONS

Context

- The fourth India-Bangladesh annual defence dialogue was held during which the two sides reviewed ongoing defence cooperation between the two countries and expressed satisfaction that collaboration is growing despite difficulties imposed by the COVID-19 pandemic, the Defence Ministry said.
- Both sides emphasised the need to work closely to implement the \$500 million line of credit extended from India for defence items, the statement said.

How has India's relationship with Bangladesh played out over the years?

- The friendship between India and Bangladesh is historic, evolving over the last 50 years.
- India's **political, diplomatic, military and humanitarian support** during Bangladesh's Liberation War played an important role towards Bangladesh's independence.
- **Post-Independence**, the India-Bangladesh relationship has oscillated as Bangladesh passed through different regimes.
- The relationship **remained cordial until** the assassination of Bangladesh's founding President Sheikh Mujibur Rahman in August 15, 1975, followed by a period of military rule and the rise of General Ziaur Rahman who became President and also assassinated in 1981.
- It **thawed again between 1982-1991** when a military-led government by General H.M. Ershad ruled the country.
- In the **last decade**, India-Bangladesh relations have warmed up, entering a new era of cooperation, and moving beyond historical and cultural ties to become more assimilated in the areas of trade, connectivity, energy, and defence.

Major Achievements of Indo-Bangla cooperation

- Bangladesh and India have achieved the rare feat of solving their border issues peacefully by ratifying the historic Land Boundary Agreement in 2015, where enclaves were swapped allowing inhabitants to choose their country of residence and become citizens of either India or Bangladesh.
- The Bangladesh government led by Prime Minister Sheikh Hasina **has uprooted anti-India insurgency elements from its borders, making the India-Bangladesh border one of the region's most peaceful**, and allowing India to make a massive redeployment of resources to its more contentious borders
- Bangladesh is **India's biggest trading partner in South Asia** with exports to Bangladesh in FY 2018-19 at \$9.21 billion and imports at \$1.04 billion.
- India has **offered duty free access to multiple Bangladeshi products**. Trade could be more balanced if non-tariff barriers from the Indian side could be removed.
- On the development front, **cooperation has deepened**, with India extending **three lines of credit** to Bangladesh in recent years amounting to \$8 billion for the construction of roads, railways, bridges, and ports.
- Bangladeshis make up a **large portion of tourists in India**, outnumbering all tourists arriving from western Europe in 2017, with one in every five tourists being a Bangladeshi.
- Bangladesh accounts for **more than 35% of India's international medical patients and contributes more than 50% of India's revenue from medical tourism**.

What are irritants in Indo-Bangladesh relationship?

- Proposed countrywide National Register of Citizens (NRC) and the Citizenship Amendment Act (CAA) passed last year.
- Bangladesh had cancelled visits by ministers, and Hasina has expressed reservations about CAA. She commented that the CAA and the proposed nationwide NRC are **"internal matters"** of India, the CAA move was **"not necessary"**.

How have relations between Bangladesh and China been developing?

- "China is the biggest trading partner of Bangladesh and is the foremost source of imports.
- In 2019, the trade between the two countries was \$18 billion and the trade is heavily in favour of China,"

- Recently, **China declared zero duty on 97% of imports from Bangladesh.** The concession flowed from China's duty-free, quota-free programme for the Least Developed Countries.
- India has provided developmental assistance worth \$10 billion, but **China has promised around \$30 billion worth of financial assistance to Bangladesh** to overcome India assistance.
- **Bangladesh's strong defence ties with China** makes the situation complicated. China is the biggest arms supplier to Bangladesh and it has been a legacy issue. Bangladesh forces are equipped with Chinese arms including tanks, missile launchers, fighter aircraft and several weapons systems. Recently, Bangladesh purchased two Ming class submarines from China.

How has India been engaging with Bangladesh post CAA?

- In the wake of the Ladakh standoff, India has become more sensitive to Chinese defence inroads into Bangladesh.
- India and Bangladesh have cooperated on pandemic-related moves. Hasina contributed \$1.5 million in India's regional emergency fund for fighting Covid-19 and India **provided medical aid to Bangladesh.**
- The two countries have also **cooperated in railways**, with India giving 10 locomotives to Bangladesh.
- The **first trial run for trans-shipment of Indian cargo through Bangladesh to Northeast states under a pact on the use of Chittagong and Mongla ports** took place in July.
- However, in recent weeks, Pakistan PM call to Hasina raised eyebrows in Delhi. While Islamabad portrayed it as a **conversation on Kashmir**, Dhaka said it was about **cooperating to deal with Covid-19.**

How has India sought to address China's latest move?

- During recent diplomats meeting with Hasina, "security-related issues of mutual interest" were discussed.
- The visit tried to address **issues on areas that have emerged as potential irritants in the relationship.**
- Bangladesh expressed "deep concern" at the rise in killings at the Indo-Bangladesh border by "BSF or Indian nationals" during the first half of this year, and the Indian side assured that the BSF authorities have been sensitised of the matter.

Among other issues

- The two sides agreed that Implementation of projects should be done in a timely manner, and that greater attention is required to development projects in Bangladesh under the Indian Lines of Credit.
- Bangladesh **sought return of the Tablighi Jamaat members impacted by the lockdown in India**, and early release of the 25 Bangladeshi fishermen in custody in Assam. India assured Bangladesh that its nationals would be able to return soon.
- Bangladesh requested for **urgent reopening of visa issuance from the Indian High Commission in Dhaka**, particularly since many Bangladeshi patients need to visit India.
- India was also requested to **reopen travel through Benapole-Petrapole land port, which has been halted by the West Bengal government in the wake of the pandemic.**
- Bangladesh told that it is ready to collaborate in the development of a Covid-19 vaccine, including its trial, and looks forward to early, affordable availability of the vaccine when ready.

What is the way ahead?

- While the Teesta project is important and urgent from India's point of view, it will be difficult to address it before the West Bengal elections due next year.
- India should implement all its assurances in a time-bound manner to avoid China tilt.
- Anti-India sentiment in Bangladesh, which has been revived after India's CAA -NRC push need to be managed carefully as it threatens to damage Dhaka-New Delhi ties.

QUAD GROUPING

GS-II INTERNATIONAL RELATIONS

Context

- India envisages a free, open, inclusive and peaceful Indo-Pacific built on a rules-based order, sustainable and transparent infrastructure investment, External Affairs Minister S. Jaishankar said as he emphasised on mutual respect for sovereignty, amid China flexing its muscles in the strategic region.

More on the news

- Mr. Jaishankar also said that Quad—comprising the U.S., India, Japan and Australia—is the most prominent plurilateral platform that addresses contemporary challenges and opportunities in the Indo-Pacific.
- India envisages the Association of Southeast Asian Nations (ASEAN) to be at the centre of the Indo-Pacific, both literally and substantively.

- China is engaged in hotly contested territorial disputes in both the South China Sea and the East China Sea. China claims sovereignty over all of the South China Sea. Vietnam, Malaysia, the Philippines, Brunei and Taiwan have counter claims.
- Beijing has also built up and militarised many of the islands and reefs it controls in the region. Both areas are stated to be rich in minerals, oil and other natural resources and are also vital to global trade.
- Chinese and Indian troops are engaged in prolonged standoff in Eastern Ladakh.
- U.S., Japan, India and Australia had in 2017 given shape to the long-pending proposal of setting up the "Quad" or the Quadrilateral coalition to counter China's aggressive behaviour in the Indo-Pacific region.
- The U.S. says Quad is not an alliance but a grouping of countries driven by shared interests and values and interested in strengthening a rules-based order in the strategically-important Indo-Pacific region.

About QUAD

- It is a bloc of countries positioning itself as a **check against China's growing aggression in the Indo-Pacific and outside.**
- India is a "critical and crucial" member of the Quad.

Background

- In the aftermath of Indian Ocean tsunami of 2004, **Australia, Japan, India, and America formed a Regional Core Group in 2004.**
- Then **Japanese PM Shinzo Abe proposed an "Arc of Freedom and Prosperity" in 2006.**
- The first meeting of the initial Quad was held in **May 2007 as officials gathered for the ASEAN Regional Forum meeting.**
- Japan PM Shinzo Abe after returning to office called for a **"democratic security diamond," a Quad 2.0.**

The QUAD 2.0

- The move to set up the quadrilateral also comes in the **backdrop of growing Chinese assertiveness in the South China Sea and China's aggressive posturing.**
- Since its revival in late 2017, the Quad met twice a year in 2018 and 2019.
- In New York in September 2019, the four countries held the first ministerial-level meeting of the Quad "to discuss collective efforts in shared commitments and close cooperation on counter-terrorism, mentoring, assistance in disaster relief, airspace security, cooperation, development, finance and cyber security efforts."

Significance of Quad-grouping

- All four nations **share a deep interest in maintaining a stable balance of power in the Indo-Pacific and** preventing a regional state from becoming dominant.
- All four states share an interest in **detering the use of forceful or coercive practices to resolve political and territorial disputes in the region.**
- All four states are committed to the current **rules-based economic order in** the Indo-Pacific. This is based on free trade, open investment environments, open competitive tendering, the rule of law, and standards of good governance from which all continue to benefit.
- All four nations support to **strengthen liberal democratic governance within** the Indo-Pacific. The region has not been immune to the global decline in observance of political rights and civil liberties.

How is China responding to Quad?

- China's endeavor is to conflate the Quad with the Indo-Pacific vision, and link both to the so-called China Containment Theory.
- In 2016, China itself established a **Quadrilateral Cooperation and Coordination Mechanism with Afghanistan, Pakistan and Tajikistan.**
- More recently, China has established **Quadrilateral Cooperation with Pakistan, Afghanistan and**
- The strategic community in China, nevertheless, had branded it an emerging "Asian NATO".

Quad Nations and China

- **USA** had followed a policy to contain China's increasing influence in East Asia. Therefore, **USA sees the coalition as an opportunity to regain its influence in the Indo-Pacific region.**
- **Australia** is concerned about China's growing interest in its land, infrastructure and politics, and influence on its universities.
- **Japan** has expressed concerns related to **China's territorial transgression in the region.**
- China's violation of international norms, particularly its **construction of military facilities on reclaimed islands in the South China Sea**, and its growing military and economic power, pose a **strategic challenge to India.**

QUAD Significance for India

- **Act East Policy:** It gives a **powerful platform to advance its interests in East Asia**, coordinate strategies with powerful friends and add more strength to its Act East initiative.
- It will **deepen India's ties with US, Australia and Japan** and will provide New Delhi significant leverage in shaping US policies in Afghanistan-Pakistan to the benefit of India.
- Through QUAD India seeks to reassert rule-based world order to **counter China's growing power and assertion**.
- **Defence-related spending reduced** in this time of COVID pandemic and associated with lockdowns, Quad will provide heavyweight to India's interests.
- **Sustainable Development in the Indian Ocean Region:** India holds the responsibility to act as the net security provider in the Indian Ocean region.
- **Issue-based alliance or multilateralism:** India has moved beyond non-alignment towards an issue-based alliance with no formal agreements. Therefore, joining Quad will be in line with the present foreign policies of the government.

Challenges

- **Translating intent into action** will require a strengthening of ties in existing fields, as well as non-traditional areas such as cyber/information security, energy and climate change, disaster management, etc.
- Poor Indian and Japanese financial and logistical bandwidth to competitively invest in the IPR compounds the Quad's shortcomings.
- **Complex economic relationships between the Core Quad and China-** for all Quad members, China is either the first or the second largest trading partner, or a key import/export partner.
- If the Quad begins a **Quad-plus initiative**, it will not only be confronting these challenges, but will also have to contend with other issues such as disputes even amongst members, and differing dispositions towards China.

Challenges for India

- **Non-alignment:** India is abandoning its "sacred" tradition of non-alignment.
- **Trustworthiness of US:** US military alliances with Japan and the Philippines has not provided any challenge to Chinese aggression in the region.
- **No clarity on objectives:** India wants advancing the security and economic interests of all countries having legitimate and vital interests in the Asia-Pacific region whereas US is pitching for mutating the Indo-Pacific Quad into a more formal security grouping modelled on NATO.
- **Individual visions of the Indo-Pacific:** It would be difficult to align the combined vision of the grouping with that of their individual visions regarding Indo-Pacific.
- **Internal economic changes:** If India wants to engage the Quad partners on reforming the China-centred economic globalisation, it also requires engineering many changes on trade-related aspects, which might prove to be difficult, given India's drive for self-reliance

Recommendations for greater collaboration among quad member governments in the years to come

- **Establish Working Groups On Defense And Infrastructure:** Broadening the current Quad format of foreign ministry senior official-level meetings to include representatives from defense ministries would be a necessary first step toward creating a whole-of-Quad "working 2+2."
- **Develop An Indo-Pacific Infrastructure And Development Coordination Working Group:** it would ensure that all four Quad nations are committed to creating a roadmap to sustainable, high-quality infrastructure for developing countries. It would further permit the streamlining of various inter- Quad infrastructure initiatives, including the Japan India sponsored Asia-Africa growth corridor.
- Pursue An Annual Meeting Of Joint Operational Commands And Encouragement Of Exchanges
- Add **Crisis Response, Humanitarian Aid, And Disaster Relief to the Quad's Agenda.**
- **Appeal to ASEAN:** The Quad should seek to harness consensus with ASEAN as a whole, promoting cooperation in the shared interests among the two.
- **2+2 And Malabar:** Three of the four Quad countries enjoy ministerial-level "2+2" defense and foreign ministers dialogues with one another. India and Australia should upgrade their "2+2" to the ministerial level to close the loop and complete the square.
- **Boost Non-Traditional Security Cooperation:** elevating collaboration on mine-sweeping technologies, anti-piracy operations, and pollution control, pandemic responses, joint escorts of international shipping, force structuring, coast guard collaboration, counter-proliferation initiatives, and exchange of information on white shipping.
- Expand Cooperation On Space And Maritime Domain Awareness

CHINA PAKISTAN ECONOMIC CORRIDOR

GS-II INTERNATIONAL RELATIONS

Context

- China's investments in infrastructure projects under its Belt and Road Initiative (BRI) have declined while Beijing's short and medium-term assistance to partner countries, some of which are dealing with rising debt levels, is increasing, according to recent research highlighting a shift in China's approach to overseas lending.

Details

- In the first half of 2022, China's engagement through financial investments and contracts in 147 countries amounted to \$28.4 billion, up by 47% from the previous year, said a report from the Green Finance and Development Centre (GFDC) at Shanghai's Fudan University.
- Of this, \$11.8 billion was through investments and \$16.5 billion through project contracts.
- This marked a decline from \$48.5 billion in the same period in 2019.
- Since the launch of the BRI in 2013, the report estimated China's total engagement at \$932 billion, with \$561 billion in construction contracts and the rest in other investments.
- The report noted three clear trends in the BRI: a growing role for Chinese State-owned Enterprises; the average size for project deals falling, from \$558 million in 2021 to \$325 million last year; and an increasingly uneven spread of engagement.
- Several countries "saw no Chinese engagement" in the first half of the year, including Russia, Sri Lanka and Egypt, while the figure in Pakistan was down by 56%.
- At the same time, China's short and medium-term lending to several BRI partners has rapidly risen, according to research from the AidData research lab reported by Bloomberg this month.
- In the past five years, China "made nearly \$26 billion in short and medium-term loans to Pakistan and Sri Lanka" alone, marking a shift in its overseas engagement "from funding infrastructure toward providing emergency relief."



What is CPEC?

- CPEC is a 3,000-km long route of infrastructure projects connecting China's northwest Xinjiang Uygur Autonomous Region and the Gwadar Port in the western province of Balochistan in Pakistan.
- It is a bilateral project between Pakistan and China, intended to promote connectivity across Pakistan with a network of highways, railways, and pipelines accompanied by energy, industrial, and other infrastructure development projects.
- It will pave the way for China to access the Middle East and Africa from Gwadar Port, enabling China to access the Indian Ocean and in return China will support development projects in Pakistan to overcome the latter's energy crises and stabilising its faltering economy.
- CPEC is a part of the Belt and Road Initiative.

Background

- In 2013, Chinese President Xi Jinping, during his visits to Kazakhstan and Indonesia, expressed his vision to build a Silk Road Economic Belt (SERB) and a 21st Century Maritime Silk Road (MSR), to break the "bottleneck" in Asian connectivity. Thus, the Belt and Road initiative was born.
- The initiative envisioned a Chinese-led investment of over \$1 trillion in partner countries by 2025. More than 60 countries have now joined BRI agreements with China, with infrastructure projects under the initiative being planned or under construction in Asia, Africa, Europe, and Latin America.
- To finance BRI projects, China offers huge loans at commercial interest rates that countries have to pay within a fixed number of years.
- The west has accused China of debt-trapping by extending "predatory loans" that force countries to cede key assets to China. However, research indicates that low and middle-income countries are often the ones to approach China after not being able to secure loans from elsewhere.
- In recent years, the BRI seems to have experienced a slowing down as annual Chinese lending to countries under the initiative slimmed from its peak of \$125 billion in 2015 to around \$50 to \$55 billion in 2021.

Investments in the Indian neighbourhood

- The **biggest project under BRI is in Pakistan, the China Pakistan Economic Corridor (CPEC)**. Over time, China pledged \$62 billion in low-interest loans and financing from Chinese state-owned banks and the Asian Development Bank (ADB).
- **Bangladesh, which joined the BRI in 2016, has been promised the second-highest belt and road investment by China in South Asia after Pakistan.**
- In Sri Lanka, multiple infrastructure projects that were being financed by China came under the fold of the BRI after it was launched in 2013. The island nation in the last couple of years has witnessed competition between India and China in port terminal and energy projects. **In 2021, Colombo ejected India and Japan out of a deal to develop the East Container Terminal at the Colombo port and got China to take up the project.** Some BRI projects in Sri Lanka have been described as white elephants – such as the Hambantota port.
- **Afghanistan has not comprehensively been brought into the BRI, despite a Memorandum of Understanding (MoU) being signed with China in 2016**
- **One of the most prominent BRI projects undertaken in the Maldives is the two km long China-Maldives Friendship Bridge – a \$200 million four lane bridge.**

INDIA-IRAN MOU ON SEAFARERS

GS-II INTERNATIONAL RELATIONS

Context

- In a bid to aid the movement of seafarers between the two countries, India and Iran **signed a memorandum of understanding on recognition of Certificates of Competency in Unlimited Voyages to help seafarers from both countries as per the provisions of the International Convention on Standards of Training, Certification and Watch Keeping for Seafarers, 1978.**

Details

- The MoU was signed during a bilateral meeting between the Union Minister for Ports, Shipping and Waterways and Ayush, Sarbananda Sonowal and Iranian Minister of Roads and Urban Development Rostam Ghasemi. Mr. Sonowal is on a three-day visit to Iran.
- The Union Minister reiterated the importance of the bilateral relationship between the two countries.
- **The role of Chabahar as a trade multiplier for the region was highlighted by the Union Minister at the meeting as the potential of the port to act as a swift, economical trade conduit between Central Asia and South Asia, even South East Asia, remains to be tapped fully.**
- The Minister also called on Iranian Vice-President Mohammad Mokhber. Mr. Mokhber, who is Iran's special envoy for relations with India, said the development of the Chabahar port would lead to an increase in trade and shipment volume.
- Since India Ports Global Private Ltd. (IPGPL) assumed the operations of Shahid Beheshti Port, it has handled over 4.8 million tonnes of bulk cargo.
- With close cooperation between India's IPGPL and Iranian stakeholders including Iran's Port and Maritime Organisation, Iranian Customs Administration and the Chabahar Free Zone Authority, the Shahid Beheshti Port Authority & other stakeholders, the port is likely to act as a catalyst to unlock the huge trade potential in the region.
- In 2020, India supplied 75,000 tonnes of wheat to Afghanistan as part of a humanitarian assistance programme as well as provided for 40,000 litres of Malathion and 96% ULV pesticides to Iran via the Chabahar port in an effort to mitigate locust threat to agriculture and enhance food security in the region.

Chabahar Port

- It is **located in the Indian Ocean in the Sistan province of Iran.**
- The Chabahar port is considered a gateway to golden opportunities for trade by India, Iran and Afghanistan with central Asian countries.
- The port, which is easily accessible from India's western coast, is increasingly seen as a counter to Pakistan's Gwadar Port which is being developed with Chinese investment.
- **Chabahar Port provides an option of alternate supply route to everyone, thus reducing the importance of Pakistan with respect to trade.**
- **It is located on the Gulf of Oman and is only 72 km away from the Gwadar port in Pakistan which has been developed by China.**
- China is aggressively pursuing its own Belt and Road Initiative (BRI) under the One Belt One Road (OBOR) project.
- In future, the Chabahar project and the International North South Transport Corridor (INSTC) will complement each other by optimising Indian connectivity with Russia and Eurasia.
- Also, it **gives India direct access to Afghanistan and other Central Asian Republics**

Background

- India-Iran relations span millennia marked by meaningful interactions.
- The two countries shared a border till 1947 and share several common features in their language, culture and traditions.
- Both South Asia and the Persian Gulf have strong commercial, energy, cultural and people-to-people links.

Political relations

- India and Iran signed a friendship treaty on March 15, 1950.
- Before the Iranian Revolution of 1979, the Shah of Iran visited India twice (March 1956 and February 1978) and Prime Minister Jawaharlal Nehru visited Iran in 1963. Prime Minister Indira Gandhi and Prime Minister Morarji Desai visited Iran in April 1974 and June 1977 respectively.
- After the Iranian Revolution, Prime Minister Narasimha Rao visited Iran in 1993 and President Rafsanjani paid a visit to India in 1995.
- The trend was enhanced at the turn of the millennium with the visit of Prime Minister Shri Atal Bihari Vajpayee to Tehran in April 2001 wherein the two countries signed the "Tehran Declaration" which set forth the areas of possible cooperation between the two countries.
- President Mohammad Khatami visited India from January 24-28, 2003 as the Chief Guest at the Republic Day parade. Both sides signed "The New Delhi Declaration" which set forth the vision of strategic partnership between India and Iran.
- Prime Minister Dr. Manmohan Singh visited Iran to attend the 16th Non-Aligned Movement (NAM) Summit held in Tehran from August 28-31, 2012.
- Prime Minister Shri Narendra Modi paid a bilateral visit to Iran from May 22-23, 2016. Prime Minister called on the Supreme Leader Ayatollah Khamenei and held delegation level talks with President Rouhani. A Joint Statement titled "Civilizational Connect, Contemporary context" was released.
- Dr. Hassan Rouhani, President of Iran, paid his first State Visit to India from February 15-17, 2018.

Bilateral Consultative Mechanisms

- The two countries have in place several Bilateral Consultative Mechanisms at various levels which meet regularly. These include the Joint Committee Meeting (JCM) chaired at the Ministerial level, the Foreign Office Consultations chaired at the Foreign Secretary level, and the Joint Consular Committee Meeting at the level of Joint Secretary/DG.

Defence relations

- Both India and Iran also consult each other on security matters.
- There are regular bilateral exchanges at the level of National Security Advisors and Deputy National Security Advisors.

Economic and Commercial Relations

- India-Iran commercial ties were traditionally dominated by Indian import of Iranian crude oil.
- In 2018-19 India imported US\$ 12.11 bn worth of crude oil from Iran.
- The bilateral trade during 2019-20 was \$4.77 billion, a decrease of 71.99% as compared to the trade of \$17.03 billion 2018-19.
- What is significant is that Indian exports to Iran between 2011-12 and 2019-20 have grown by 45.60%.
- Both countries are negotiating a Preferential Trade Agreement
- The Trilateral Transit Agreement (Chabahar Agreement) was signed by the three transport ministers of India, Iran and Afghanistan in the presence of Prime Minister Shri Narendra Modi, President Dr. Rouhani and President Ashraf Ghani in May 2016.

Humanitarian Assistance

- India has also helped Iran in times of natural disasters and health emergencies.
- India delivered aid that included PPE kits and PCR machines to Iran in April 2020 during the COVID-19 crisis.
- In 2019, India provided 103 tonnes of aid to Iran during the floods that ravaged the country.
- In June 2020, India supplied Malathion pesticide to Iran to fight the menace of desert locusts.

Indian community

- The Indian community in Iran comprises around 5000 Indian nationals.
- There is a high-level commitment in both countries to promote and facilitate people-to-people contacts.

TIGRAY CRISIS**GS-II INTERNATIONAL RELATIONS****Context**

- **Tedros Adhanom Ghebreyesus, director-general of the World Health Organization (WHO), described the humanitarian crisis in Ethiopia's Tigray region as the "worst disaster on earth".**

More on the news

- Questioning why the situation was not getting enough attention from the international community, he said: "maybe the reason is the colour of the skin of the people."
- Nowhere in the world, six million people are sealed off...from basic services, from their own money, from telecom, from food, from medicine.
- Further, the World Food Programme (WFP) said, that the conflict in Ethiopia, which started in November 2020, had left nearly half of Tigray's population without enough food as aid groups struggled to reach rural areas owing to inadequate fuel supplies.

Details

- Ethiopia, the second most populous country in Africa, is situated in the strategic Horn of Africa region.
- It is bordered by Eritrea, Djibouti, Sudan, Somalia, and Kenya.
- The country is divided into 10 regions based on the concentration of ethnic groups.
- The Oromo- the largest ethnic group in the country, and Amhara- the second largest group, make up more than 60 per cent of Ethiopia's 115 million people.
- The Tigrayans, meanwhile, constitute around 6-7 per cent and are an ethnic minority.
- In 1975, the 'Derg', a Soviet-backed Marxist military dictatorship led by Mengistu Haile Mariam was established in Ethiopia and ruled over the country till 1991, when it was ousted.
- The Tigray People's Liberation Front (TPLF) was formed as a small ethno-nationalist paramilitary group and a political outfit in the 1970s, with its base in the mountains of Tigray. It grew into a formidable force that played a central role in fighting the dictatorship and went on to head the country's ruling coalition of parties – the Ethiopian People's Revolutionary Democratic Front (EPRDF) – for nearly three decades.
- TPLF guerrillas were considered war heroes in Addis Ababa when the dictatorship fell in 1991.
- TPLF leader Meles Zenawi became the President and then Prime Minister, overseeing the country's transition from military rule to a system of ethnic federalism- which meant that while the ruling coalition EPRDF held power at the Centre, regional parties had some powers in ethnic provinces.
- Under Zenawi's leadership, Ethiopia went through an economic transformation, strengthened ties with the United States to become one of its biggest aid recipients, and enjoyed relative peace among the various ethnic groups despite fighting a fierce border war with Eritrea.
- Although many of its members belonged to the Tigrayan minority, the TPLF reportedly wielded significant influence in the coalition as well as the whole country.
- After Zenawi's death in 2012, however, ethnic faultlines started to resurface in Ethiopia. The EPRDF in the years of its rule had grown increasingly authoritarian and intolerant of dissent.
- After it won the national election in 2015, the coalition faced popular unrest and resistance led by the Oromos and Amharas for the following two years, leading to the election of a new leader – current Ethiopian Prime Minister Abiy Ahmed.
- An ethnic Oromo, Mr. Ahmed was welcomed as a reformer, who in the first year of his leadership, ended longstanding hostilities and the war with neighbouring Eritrea, lifted the emergency, granted amnesty to thousands of political prisoners, lifted curbs on the media, legalised banned political outfits and dismissed military and civilian leaders who were facing allegations of corruption and other wrongdoing. He was awarded the Nobel Peace Prize in 2019 for his efforts in peacemaking.

What led to the current conflict?

- Things started to change in the subsequent years of Mr. Ahmed's leadership.
- In late 2019, the former intelligence officer and software engineer dissolved the EPRDF coalition to create a new one- the Prosperity Party, virtually ending TPLF's reign in Addis Ababa.
- He expressed his ambitious vision of rewriting the power balance in the country, forming an all-encompassing Ethiopian identity and extending political representation to hitherto excluded ethnic groups such as the Oromo, the country's largest but politically marginalised group.
- But previously dormant ethnic and communal violence grew during his reign, leading to displacement.
- United Nations has said that ethnic violence in the country had risen to "an alarming level" and ethnic intolerance was growing due to the stigmatisation of certain groups.

- The ties between the government and TPLF worsened when the former decided to postpone elections in September 2020, citing the pandemic.
- TPLF held its own elections in Tigray, calling the central government illegitimate.
- In November of that year, the TPLF carried out a pre-emptive strike in Tigray, saying that it was a retaliation to the federal troops Mr. Ahmed had sent for an attack to the borders of Tigray.
- It was after this that Mr. Ahmed declared war on Tigray, beginning the current conflict.
- His government also declared TPLF a terrorist organisation. Joining forces with other ethnic militia and Eritrean troops, Mr. Ahmed managed to capture most of Tigray and gained control of its capital Mekele. On November 28, 2020, he announced that "major military operations were completed".
- However, this did not end the war. The TPLF, still very influential, regrouped in the northern mountains and later joined forces with a large Oromo militia, forcing the government to retreat from Tigray and even launching incursions into neighbouring regions of Amhara, Afar, and Oromio.

How bad is the humanitarian situation?

- Tigray and its neighbouring regions are facing starvation, absence of medical facilities, no access to their own money due to shut-down banking services, ethnic and physical violence, and raids at the hands of warring forces.
- The government declared a ceasefire on humanitarian grounds but in an effort to break the TPLF in June last year, imposed a blockade on Tigray, shutting power, telecommunications, banking and commercial transit facilities.
- This, aid agencies said, made it impossible to deliver humanitarian, economic, and medical assistance to Tigrayans.
- The U.N. called it "a de facto humanitarian aid blockade." It noted that just 15 per cent of cash needs for humanitarian operations have entered Tigray since July 2021.
- The U.N. estimated last year that over 90 per cent of Tigray's people needed emergency food aid — a total of 5.2 million.
- It was estimated that 400,000 and 900,000 people were facing famine conditions in Tigray.
- The United Nations High Commissioner for Refugees (UNHCR) said in July this year: "the humanitarian situation across Northern Ethiopia is extremely concerning, with more than 2.6 million internally displaced people (IDPs), over 240,000 returnees and more than 97,000 refugees & asylum-seekers in the Afar, Amhara and Tigray Regions."

INDIA - BANGLADESH RELATIONS

GS-II INTERNATIONAL RELATIONS

Context

- India and Bangladesh discussed a wide range of issues related to the major common rivers such as the Ganga, Teesta and several smaller rivers during the 38th meeting of the Joint River Commission (JRC).

Details

- The Indian delegation led by Gajendra Singh Shekhawat, Minister for Jal Shakti, assured the Bangladesh delegation that India was making "utmost efforts" for agreement on the Teesta.
- The JRC meeting, held in a cordial and friendly atmosphere, discussed the whole gamut of the issues related to the common rivers between the two countries, especially the Ganga, Teesta, Manu, Muhuri, Khowai, Gumti, Dharla, Dudhkumar and Kushiyara.
- The two sides also discussed exchange of flood-related data and information, river-bank protection works, common basin management, and also the River Interlinking Project of India.
- Bangladesh side requested for conclusion of the long-pending Teesta Waters Sharing Treaty at an early date. The Indian side assured of their utmost efforts in concluding the agreement.

How has India's relationship with Bangladesh played out over the years?

- The friendship between India and Bangladesh is historic, evolving over the last 50 years.
- India's **political, diplomatic, military and humanitarian support** during Bangladesh's Liberation War played an important role towards Bangladesh's independence.
- **Post-Independence**, the India-Bangladesh relationship has oscillated as Bangladesh passed through different regimes.
- The relationship **remained cordial until** the assassination of Bangladesh's founding President Sheikh Mujibur Rahman in August 15, 1975, followed by a period of military rule and the rise of General Ziaur Rahman who became President and also assassinated in 1981.
- It **thawed again between 1982-1991** when a military-led government by General H.M. Ershad ruled the country.
- In the **last decade**, India-Bangladesh relations have warmed up, entering a new era of cooperation, and moving beyond historical and cultural ties to become more assimilated in the areas of trade, connectivity, energy, and defence.

Major Achievements of Indo-Bangla cooperation

- Bangladesh and India have achieved the rare feat of solving their border issues peacefully by ratifying the historic Land Boundary Agreement in 2015, where enclaves were swapped allowing inhabitants to choose their country of residence and become citizens of either India or Bangladesh.
- The Bangladesh government led by Prime Minister Sheikh Hasina **has uprooted anti-India insurgency elements from its borders, making the India-Bangladesh border one of the region's most peaceful**, and allowing India to make a massive redeployment of resources to its more contentious borders
- Bangladesh is **India's biggest trading partner in South Asia** with exports to Bangladesh in FY 2018-19 at \$9.21 billion and imports at \$1.04 billion.
- India has **offered duty free access to multiple Bangladeshi products**. Trade could be more balanced if non-tariff barriers from the Indian side could be removed.
- On the development front, **cooperation has deepened**, with India extending **three lines of credit** to Bangladesh in recent years amounting to \$8 billion for the construction of roads, railways, bridges, and ports.
- Bangladeshis make up a **large portion of tourists in India**, outnumbering all tourists arriving from western Europe in 2017, with one in every five tourists being a Bangladeshi.
- Bangladesh accounts for **more than 35% of India's international medical patients and contributes more than 50% of India's revenue from medical tourism**.

What are irritants in Indo-Bangladesh relationship?

- Proposed countrywide National Register of Citizens (NRC) and the Citizenship Amendment Act (CAA) passed last year.
- Bangladesh had cancelled visits by ministers, and Hasina has expressed reservations about CAA. She commented that the CAA and the proposed nationwide NRC are "**internal matters**" of India, the CAA move was "**not necessary**".

How have relations between Bangladesh and China been developing?

- "China is the biggest trading partner of Bangladesh and is the foremost source of imports.
- In 2019, the trade between the two countries was \$18 billion and the trade is heavily in favour of China,"
- Recently, **China declared zero duty on 97% of imports from Bangladesh**. The concession flowed from China's duty-free, quota-free programme for the Least Developed Countries.
- India has provided developmental assistance worth \$10 billion, but **China has promised around \$30 billion worth of financial assistance to Bangladesh** to overcome India assistance.
- **Bangladesh's strong defence ties with China** makes the situation complicated. China is the biggest arms supplier to Bangladesh and it has been a legacy issue. Bangladesh forces are equipped with Chinese arms including tanks, missile launchers, fighter aircraft and several weapons systems. Recently, Bangladesh purchased two Ming class submarines from China.

How has India been engaging with Bangladesh post CAA?

- In the wake of the Ladakh standoff, India has become more sensitive to Chinese defence inroads into Bangladesh.
- India and Bangladesh have cooperated on pandemic-related moves. Hasina contributed \$1.5 million in India's regional emergency fund for fighting Covid-19 and India **provided medical aid to Bangladesh**.
- The two countries have also **cooperated in railways**, with India giving 10 locomotives to Bangladesh.
- The **first trial run for trans-shipment of Indian cargo through Bangladesh to Northeast states under a pact on the use of Chittagong and Mongla ports** took place in July.
- However, in recent weeks, Pakistan PM call to Hasina raised eyebrows in Delhi. While Islamabad portrayed it as a **conversation on Kashmir**, Dhaka said it was about **cooperating to deal with Covid-19**.

How has India sought to address China's latest move?

- During recent diplomats meeting with Hasina, "security-related issues of mutual interest" were discussed.
- The visit tried to address **issues on areas that have emerged as potential irritants in the relationship**.
- Bangladesh expressed "deep concern" at the rise in killings at the Indo-Bangladesh border by "BSF or Indian nationals" during the first half of this year, and the Indian side assured that the BSF authorities have been sensitised of the matter.

Among other issues

- The two sides agreed that Implementation of projects should be done in a timely manner, and that greater attention is required to development projects in Bangladesh under the Indian Lines of Credit.
- Bangladesh **sought return of the Tablighi Jamaat members impacted by the lockdown in India**, and early release of the 25 Bangladeshi fishermen in custody in Assam. India assured Bangladesh that its nationals would be able to return soon.

- Bangladesh requested for **urgent reopening of visa issuance from the Indian High Commission in Dhaka**, particularly since many Bangladeshi patients need to visit India.
- India was also requested to **reopen travel through Benapole-Petrapole land port, which has been halted by the West Bengal government in the wake of the pandemic**.
- Bangladesh told that it is ready to collaborate in the development of a Covid-19 vaccine, including its trial, and looks forward to early, affordable availability of the vaccine when ready.

What is the way ahead?

- While the Teesta project is important and urgent from India's point of view, it will be difficult to address it before the West Bengal elections due next year.
- India should implement all its assurances in a time-bound manner to avoid China tilt.
- Anti-India sentiment in Bangladesh, which has been revived after India's CAA -NRC push need to be managed carefully as it threatens to damage Dhaka-New Delhi ties.

INDIA EGYPT RELATIONS

GS-II INTERNATIONAL RELATIONS

Context

- In a unique move **Egypt Post released a commemorative postage stamp to celebrate 75 years of diplomatic relations between Egypt and India** that were established with Egypt's recognition of the independence of India on 18 August 1947, just three days after India's independence.

Background

- India and Egypt, two of the world's oldest civilizations, have enjoyed a history of close contact from ancient times.
- **Ashoka's edicts refer to his relations with Egypt under Ptolemy-II.**
- **In modern times, Mahatma Gandhi and Saad Zaghloul shared common goals on the independence of their countries, a relationship that was to blossom into an exceptionally close friendship between President Nasser and Prime Minister Nehru, leading to a Friendship Treaty between the two countries in 1955.**

Political Relations

- India and Egypt share close political understanding based on long history of contacts and cooperation in bilateral, regional and global issues.
- The joint announcement of establishment of diplomatic relations at Ambassadorial level was made on 18 August 1947.
- Both countries have cooperated closely in multilateral fora and were the founding members of Non-Aligned Movement.
- **The year 2022 is of particular significance since it marks the 75th anniversary of diplomatic relation between India and Egypt.**

Bilateral mechanisms

- There are several mechanisms of bilateral institutional dialogue at different levels.

Economic Relations

- The India-Egypt Bilateral Trade Agreement has been in operation since March 1978 and is based on the Most Favoured Nation clause and the bilateral trade has increased more than five times in last ten years.
- The bilateral trade in 2018-19 reached US\$ 4.55 billion.
- Despite Pandemic, the volume of trade declined only marginally to US \$ 4.5 billion in 2019-20 and to US \$ 4.15 billion in 2020-21 (Egypt's exports to India were valued at US\$ 1.89 billion and imports from India at US\$ 2.26 billion with India having a favorable trade balance of US\$ 372 million.)
- Bilateral trade has expanded rapidly in 2021-22, amounting to 7.26 billion registering a 75% increase compared to FY 2020-21.
- India's exports to Egypt during this period amounted to US\$ 3.74 billion, registering a 65% increase over the same period in FY 2020-21. At the same time, Egypt's exports to India reached US\$ 3.52 billion registering an 86% increase.

Development assistance:

- The grants-in-aid projects include: Pan Africa Tele-medicine and Tele-education project in Alexandria University, Solar electrification project in Agaween village and Vocational Training Centre for textile technology in Shoubra, Cairo, which have been completed.
- Technical cooperation and assistance have been a major part of our bilateral relationship. Since 2000, over 1250 Egyptian officials have benefited from ITEC and other programs like ICCR and IAFS scholarships.
- In the field of scientific cooperation, ICAR and the Agricultural Research Center of Egypt are working in the field of agricultural research.
- 'Science & Technology' cooperation is implemented through biennial Executive Programmes and Scientific Cooperation Programme between CSIR (India) and NRC (Egypt).

- Space cooperation is an emerging vertical of cooperation between India and Egypt. Joint Working Group meetings and discussions between ISRO and NARSS (National Authority for Remote Sensing and Space Sciences) have been held, since an MoU was signed in

Defence Relations

- There was close cooperation between the Air Forces, with efforts at jointly developing a fighter aircraft in 1960s.
- IAF pilots had also trained Egyptian pilots from 1960s until 1984.
- Most of the current defence cooperation is determined by Joint Defence Committee (JDC) activities.
- Egypt participated in the Multinational Training Exercise for friendly African countries held at Pune in 2019. The first ever IAF-EAF Joint Tactical Air Exercise, Dessert Warrior, was held in 2021.
- The first ever Special Forces exercise "Cyclone 1" between India and Egypt planned in Jodhpur from 8th – 22nd January 2022 stands postponed.

Cultural Relations

- The Maulana Azad Centre for Indian Culture (MACIC) has been promoting cultural cooperation between the two countries, through regular activities such as Hindi, Urdu and Yoga classes; seminars; film shows; exhibitions and participation in local cultural activities.
- 'Sawt-ul-Hind', Embassy's flagship Arabic magazine for the past six decades, reached a milestone in July 2017 with the publishing of its 500th edition, depicting the strong bond and vibrant cultural exchanges between the two countries.

Indian Community

- At present, the Indian community in Egypt numbers at around 3200, most of whom are concentrated in Cairo.



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NATIONAL POLICY FOR RARE DISEASES 2021

GS-II HEALTH

Context

- Eight Centres of Excellence (CoEs) have been identified for diagnosis, prevention and treatment under National Policy for Rare Diseases 2021. The Government launched National Policy for Rare Diseases (NPRD), in March, 2021 for the treatment of rare disease patients.

What is a Rare disease?

- Lifelong disease or disorder condition with a prevalence of 1 or less, per 1000 population is defined by the World Health Organization (WHO) as a rare disease. Some examples of rare diseases include hemangiomas, Hirschsprung disease, Gaucher disease etc.
- There is no single definition for rare diseases. The parameters for the definition vary depending on the country. As of yet, no definition has been set in India.

Prevalence of Rare Diseases

- More than 300 million people across the world are affected by over 7,000 rare diseases. Further, there are thousands of people living with rare diseases without proper diagnosis, let alone treatment.
- Out of 7,000 rare diseases identified across the globe, 450 have been found in the Indian population.

Challenges

Lack of awareness

- The lack of awareness among patients, physicians, clinical researchers and the general public continues to be one of the biggest hindrances in developing treatments and therapies for these diseases. Awareness among the general public is essential for early diagnosis and timely treatment.

Lack of priority

- The inability to diagnose is also a consequence of the lack of importance given to these diseases. Most physicians don't receive any training in rare diseases. Lack of awareness and training translates to incapacity to help out people with rare diseases.

Higher cost of diagnosis and treatment

- Like most parts of the world, the higher cost of diagnosis and treatment is another challenge in the rare disease sphere in India.

National Policy for Rare Diseases 2021

- In 2017, under orders from the Delhi High Court, the Union government came up with a policy for the treatment of rare diseases. It was revised in 2021. The policy has three major aims – increasing the focus on indigenous research, lowering the cost of treatment of rare diseases, and catching rare diseases at early stages.

Salient Features of National Policy for Rare Diseases (NPRD)

Categorization of Rare Diseases

- The rare diseases have been identified and categorized into 3 groups namely Group 1, Group 2 and Group 3.
 - Group 1:** Disorders amenable to one-time curative treatment.
 - Group-2:** Diseases requiring long term/lifelong treatment having relatively lower cost of treatment and benefit has been documented in literature and annual or more frequent surveillance is required.
 - Group 3:-** Diseases for which definitive treatment is available but challenges are to make optimal patient selection for benefit, very high cost and lifelong therapy.

Note: Financial support up to Rs 20 lakh under the Umbrella Scheme of Rashtriya Arogya Nidhi is available to the first group. It is left to the state governments to decide if they want to fund treatment for the second group and no support is provided to the third group.

Financial Support

- Provision for financial support of up to Rs. 50 lakhs to the patients suffering from any category of the Rare Diseases and for treatment in any of the Centre of Excellence (CoE) mentioned in NPRD-2021, outside the Umbrella Scheme of Rashtriya Arogya Nidhi.

Centres of Excellence

- In order to receive financial assistance for treatment of rare disease, the patient of the nearby area may approach the nearest Centre of Excellence to get him assessed and avail the benefits.

- Eight (08) Centres of Excellence (CoEs) have been identified for diagnosis, prevention and treatment of rare diseases. A provision of a one-time grant of Rs 5 crores is made for these centres.

Nidan Kendras

- Five Nidan Kendras have been set up for genetic testing and counselling services.

R&D

- The NPRD, 2021 has provisions for promotion of research and development for diagnosis and treatment of rare diseases; promotion of local development and manufacture of drugs and creation of conducive environment for indigenous manufacturing of drugs for rare diseases at affordable prices.

Other initiatives being taken

PLI Scheme

- Department of Pharmaceuticals has initiated the implementation of Production Linked Incentive Scheme for Pharmaceuticals. The Scheme provides for financial incentives to manufacturers selected under the Scheme for domestic manufacturing of various product categories, which also **include Orphan drugs**.

Full waiver of Basic Customs Duty (BCD) and Integrated Goods and Services Tax (IGST)

- Ministry of Finance gives full waiver of Basic Customs Duty (BCD) and Integrated Goods and Services Tax (IGST) to drugs imported **(personal use only)** for treatment of Spinal Muscular Atrophy (SMA) rare disease, making the medicines for SMA rare disease affordable.
- Ministry of Finance has given exemption from Basic Customs Duty to drugs or medicines, which are used in the treatment of Rare Diseases when imported by Centres of Excellence (CoEs) as specified in NPRD, 2021. Exemption is also for any person or institution on recommendation of any Centre of Excellence listed in NPRD, 2021, certifying that the person, for whom the drugs or medicines are imported, is suffering from a rare disease and requires the drugs or medicines for the treatment of said rare disease.

Insurance Coverage

- In 2019, the Insurance Regulatory and Development Authority (IRDA) of India **made genetic diseases non-excludable from insurance coverage**. This has provided some relief to patients with rare diseases.

Way Ahead and Final Thoughts

- Rare diseases require more consideration because of special circumstances. Affordable diagnosis and treatments will never be available for such diseases. It is not economically viable for companies to allocate resources for disease with such a small number of patients. This will not improve unless the government intervenes and provides incentives for companies.

Learning from the US

Countries such as the United States did something similar with **the Orphan Drug Act, providing companies tax breaks and relaxed clinical trial regulations to get more therapeutics for rare diseases**. The case is quite opposite in India, where a drug for spinal muscular dystrophy called Zolgensma had an added GST and import duty of Rs 6 crore over its exorbitant Rs 16 crore cost. Expensive drugs such as Zolgensma had the added GST and import duty removed last year. There is a **need to remove the added tax burden from all the therapies directed at rare diseases**. They are already out of reach of the common man and this added cost makes them more inaccessible.

- Ideally, the government should cover the entire cost for such diseases due to the unique circumstances surrounding them. **Setting up the 100 crore fund**, initially promised by the government can be the first step. This will go a long way in improving patients' access to treatment.
- More **focus has to be put on preventive strategies**.
- **Testing and counselling for those at high risk** is also a must.
- **Proper integration of genetic and rare disease curriculum into the medical syllabus** is essential for prevention and early diagnosis.
- **Tax breaks, institutions and companies' grants, making it financially viable to research, developing and manufacturing drugs for these diseases** are essential steps.
- The country needs to take a robust and transformational approach to better treat and manage people suffering from rare diseases. The government has to allocate sufficient resources for successfully reducing the rare disease burden.

WARNING LABELS ON FOOD PACKETS

GS-II HEALTH

Context

- A new study Published in open access journal Nutrients has found that in India warning labels on food packets are most effective in helping consumers identify foods high in sugar, saturated fat and sodium as compared to other labeling formats.

Details

The Study

- Participants were shown food packets with one of five Front of Package Labelling (FOPLs) – a control label (barcode), nutrient-specific warning label (octagon symbol indicating whether the product was high in salt/sugar or saturated fat), Health Star Rating, guideline for daily amount (GDA that gives nutritional content information) or traffic light label (indicating red, amber or green levels of nutrients of concern).

Objective

- The objective of the study was to evaluate the impact of different labels in helping consumers correctly identify packaged products containing excess levels of nutrients of concern such as sugar, saturate fat and sodium.

Findings

- The study found that relative to a control label, **most number of participants were able to identify a nutrient of concern**.
- This was when they were presented a packet with a warning label with 60.8% recognizing harmful nutrients as compared to 55% recognizing them when they were shown a GDA label, and 54.8% when shown a traffic light label. **HSR label performed the worst** with only 45% being able to recognize the three nutrients of concern.
- Warning label outperformed other labels** even where secondary outcomes were concerned such as perceived message effectiveness, which is predictive of behavioral change. However, the study also found that **warning labels failed to statistically significantly reduce intentions to purchase unhealthy packaged products**.

Need for adopting Warning labels

- Food labels **provide important information to consumers and assist them in making informed purchase decisions**. The labels can include specific nutrient claims as well as detailed nutrient composition data. Also, warning labels can be the most effective **Front of Package Labelling (FOPL)** to help Indian consumers identify & avoid unhealthy foods.

Downside

- Warning labels allow companies to prove the negligence was on the part of the consumer. If it can prove that in court, then the ruling will be against the consumer, and the company wins the case.

Final Thoughts

- In a country where there is a demographic transition taking place and there is dominance of non-communicable diseases and multiple morbidities such as diabetes, cardiovascular diseases, **we need to adopt a suitable strategy** based on evidence **to make consumers aware of nutrients of concern**. Hence, there is a **need for adopting warning labels**.
- Processed food packets can carry clear and simple warning labels indicating the presence of high salt, sugar and fat. The labeling can be done in such a way that it will cut across the barrier of multiple languages and easily understood by even those who cannot read.
- But the downside mentioned above remains there. Also the recent study found that **warning labels failed to statistically significantly reduce intentions to purchase unhealthy packaged products**. Thus, the FSSAI has decided to adopt **Health Star Rating (HSR) Design** instead of labels with appropriate information. As per the 'Health Star' rating system, packaged foods will display the number of stars on the front of the pack, indicating how healthy or unhealthy it is depending upon the amount of salt, sugar and fat it has. These are on the lines of the Bureau of Energy Efficiency (BEE) star rating for the electrical appliances.
- Issue:** Australia and New Zealand had introduced the voluntary HSR system in 2014. But recent studies have shown that their system is highly flawed as unhealthy food products are still able to get a high score as the rating is based on the overall nutritional value, and any inclusion of healthy ingredients like fibre and protein to an otherwise unhealthy product could easily cancel out its unhealthy ingredients (i.e. sugar, saturated fats and salt).

Bottomline

- The FSSAI should call for a wider consultation before introducing (HSR) system. It should also explore the possibility of making warning labels on food packets compulsory after proper consultation with all the stakeholders.



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GENERAL STUDIES - III

REGIONAL RURAL BANKS

GS-III ECONOMY

Context

- One of the key reasons for RRBs incurring losses is the fact that many of these branches do not have enough business as they focus mainly on offering government's schemes like direct benefit transfer in the rural areas of the country.

More on the news

- As part of reforms to make Regional Rural Banks (RRBs) financially sustainable, the government has asked them to move towards digitisation, including offering internet banking services to its customers, and expand their credit base further through increased lending to the Micro, Small and Medium Enterprises (MSME) sector.
- This was discussed in a meeting that was convened by Finance Minister Nirmala Sitharaman and attended by heads of sponsor banks and RRBs.
- After a set of reforms in the '90s, the government had, in 2005-06, initiated a consolidation programme that resulted in the number of RRBs declining from 196 in 2005 to 43 in FY21. The aim was to improve their operational viability and to take advantage of economies of scale.
- After two consecutive years of losses during the Covid period, RRBs reported a consolidated net profit of Rs 1,682 crore in FY21, and 30 of the 43 RRBs reported net profits.

Regional Rural Banks

About

- Regional Rural Banks (RRBs) are **government owned scheduled commercial banks** of India that operate at regional level in different states of India.

Establishment

- Regional Rural Banks were established under the provisions of an ordinance passed **on 26 September 1975 and the RRB Act 1976** to provide sufficient banking and credit facility for agriculture and other rural sectors.
- As a result, five RRBs were set up on 2 October 1975 **on the recommendations of the Narsimha Committee** on Rural Credit, during the tenure of Indira Gandhi's government.

Objectives of RRB

RRBs were set up with the following set of objectives

- To overcome the credit gaps that is prevailing in rural areas.
- To restrict the flow of cash from rural to urban areas by adopting necessary policies and measures.
- To generate employment opportunities in rural areas.
- To provide basic banking facilities to rural and semi-urban areas.
- To give effect to some governmental functions such as disbursement of wages under MGNREGA policy.
- To provide other bank-related facilities such as locker facility, internet banking, mobile banking, debit a credit card, etc.
- To grant credit facilities to people belonging to rural areas such as small farmers, artisans, small entrepreneurs, and so on.
- To accept deposits from people.

Ownership

- The RRBs are **jointly owned by the central government, state government, and the sponsoring bank with 50%, 15%, and 35% shareholding respectively.**

First RRB

- Prathama Bank, with head office in Moradabad, Uttar Pradesh was the first RRB.

Ministry

- These banks are **under the ownership of Ministry of Finance**, Government of India.

Mandate

- They were **created to serve rural areas with basic banking and financial services.** However, RRBs also have urban branches.

Area of operation

- The area of operation is limited to the area notified by the government of India covering, and it covers one or more districts in the State.

Working

- These banks, overall affairs are managed by a Board of Directors, which consists of one Chairman, three directors as nominated by the Central Government, maximum of two directors as nominated by the concerned State Government, and a maximum of three directors as nominated by the sponsor bank.

Management

- Management of each RRB is vested in a **nine-member board of directors, headed by a Chairman, appointed by the Government of India**. While discharging their functions, they have to cover the commercial angle, and at the same time, follow the directive principle issued by the Government. For example, they can appoint officers and employees, but their salary structure is prescribed by the Government according to the one existing in the state where the bank is located.

RRB Amendment Act, 1987

After the RRB Amendment Act, 1987, the following changes have come into force:

- The **authorized capital** was raised from Re 1 to **Rs Five crores**.
- The chairman is to be appointed by the concerned sponsor bank in consultation with National Bank for Agriculture and Rural Development (hereafter referred to as NABARD).
- Sponsor banks have to subscribe to the share capital as well as impart training to the personnel and provide managerial and financial assistance for the first five years of its functioning.
- The amalgamation of two or more RRBs can be done **with the consultation of NABARD, concerned state government, and the sponsor bank**.
- Sponsor banks are empowered to monitor the progress of their RRBs from time to time, to conduct inspections, internal audits, and to suggest measures to RRBs wherever necessary.
- From 5th July 2007, RBI has allowed RRBs to **accept foreign currency deposits from NRIs and persons of Indian origin**.

Functions

RRBs perform various functions such as

- Providing banking facilities to rural and semi-urban areas,
- Carrying out government operations like disbursement of wages of MGNREGA workers and distribution of pensions,
- Providing para-banking facilities like locker facilities, debit and credit cards, mobile banking, internet banking, and UPI services.

Weakness or the problems faced by RRBs

- Despite the fact that RRBs had a fast extension of the branch system and increment in the volume of business, these organizations experienced an extremely troublesome transformative procedure due to the following issues:
- **High overdues and poor recovery of loan** is one of the biggest concern affecting the functioning of RRB's. Reasons being poor access of granting loan, insufficient and untrained staff, unproductive or less productive use of credit, inadequate production, poor marketing facilities and improper channel of recovery system.
- There is also a problem of **regional imbalance in banking facilities provided by RRB's**. They are creating this problem by concentrating their branches in some specific states and districts & loose other prospective group of customers. Many RRB's are suffering from the problem of heavy loans because of low repaying capacity of their customer, untrained staff, low level of deposits and heavy sanction of loan without checking the creditworthiness of their customers.
- **Lack of proper co-ordination between RRB's and other financial institution** like commercial banks, NABARD and other co-operative bank has badly affected the performance of these banks.
- **Slow progress:** The progress of RRBs is not up to the expectation and is slow when comparing with other types of banks because of many restrictions on their operations. For example till 1996, RRBS were permitted to lend only under priority sector schemes.
- The basic objective of RRBs was to provide credit facilities to poor and weaker sections of society, i.e., to small and marginal farmers and other weaker sections. They were **originally having limited scope to invest their surplus funds freely**.
- A crucial practical difficulty experienced in their working by the RRBs is the **urban orientation of their staff** which is rarely inclined to serve in rural areas. There is **no true local involvement of the bank staff** in the village where they serve. Lack of training facility concerning these areas also affects the growth of RRBs.
- **Delay in decision making:** The RRBs are controlled directly and indirectly by various agencies, i.e., the sponsoring bank, NABARD, RBI, besides Central Government. Thus, it takes long time to take decisions on some important issues. This, in turn affects the progress of RRBs. However, since end 1997, the operational responsibility of RRBs has been passed on to sponsor bank.
- **Difficulties in deposit mobilization:** The RRBs are aiming at catering to the needs of poor and are not serving the needs of the rich. So, the RRBs are not able to attract the deposit from that potential sector.
- **Haste in branch expansion programme** in many cases has **resulted in lopsidedness due to lack of co-ordination**. In several cases, it could not be ensured that the branches of the RRBs are opened at centres where no commercial or co-operative banking facilities were provided.

Improvements needed in the working of RRB

- The unique role of RRB in providing credit facilities to weaker sections in the villages must be preserved. The RRB **should exist as rural banks of the rural poor.**
- The RRB may be permitted to **lend up to 25% of their total advances to the richer section of the village society.**
- The State Government should also take keen interest in the growth of RRB.
- **Participation of local people** in the equity share capital of the RRB should be allowed encouraged.
- **Local staff** may be appointed as far as possible.
- **Cooperative societies may be allowed to sponsor** or co-sponsor with commercial banks in the establishment of the RRB.
- A **uniform pattern of interest rate structure** should be devised for the rural financial agencies.
- The RRB must **strengthen effective credit administration** by way of credit appraisal, monitoring the progress of loans and their efficient recovery.
- The credit policy of the RRB should be based on the group approach of financing rural activities.
- The RRB may initiate certain **new insurable policies like deposit-linked cattle** and other animals insurance policy, crop insurance policy or the life insurance policy for the rural depositors.
- The RRB may **relax their procedure for lending** and make them easier for village borrowers.
- **Co-ordination between district level development planning and district level credit planning** is also required in order to chart out the specific role of the RRB as a development agency of the rural areas.
- Steps needed for **opening more branches in more fragile and remote zones** of the state.
- Profitability can be improved by **controlling the expenses and expanding the salary.**
- The RRBs must be **cautious and diminish the working costs** since it has been found from our examination that these costs have expanded the absolute consumption of the banks.
- The RRB must **reinforce successfully credit organization** by method for credit examination, observing the advancement of advances and their productive recuperation.

JUTE SECTOR OF INDIA

GS-III ECONOMY

Context

- India's jute economy is faltering while Bangladesh's is flourishing: Experts.

Jute industry of West Bengal

- The jute industry of West Bengal is facing a major crisis and impacting the livelihoods of thousands of workers and farmers.
- The sector directly provides employment to about **3.70 lakh workers in the country and sustains over 40 lakh farm families.**
- With 70 of the 93 (2016 data) mills in India, West Bengal is the hub of India's jute industry, valued at around Rs 10,000 crore. Several mills are on the verge of closing.

Issue

- The issue is the **procurement of raw jute at a higher cost but the final output is being sold at higher rates.**
- The government procures raw jute from farmers at a fixed Minimum Support Price (MSP) which is Rs 4,750 per quintal for the financial year 2022-23.
- This reaches the mill at Rs. 7,200 per quintal, that is, Rs. 700 more than the Rs. 6,500 per quintal cap for the final product.
- The jute mills do not procure raw material directly from the farmers because the mills are far from farmers and the process of procurement takes time. No single farmer produces enough to meet the entire demand of a mill. Thus, the middlemen or traders procure raw jute from multiple farmers and then trade it to the mills.

Supply Crunch

- The occurrence of Cyclone Amphan in May 2020 and the subsequent rains in major jute producing States aggravated the crisis. These events led to lower acreage, which in turn led to lower production and yield compared to previous years.
- Additionally, as the Commission for Agricultural Costs and Prices (CACP) stated in its report, this led to production of a lower quality of jute fibre in 2020-21 as water-logging in large fields resulted in farmers harvesting the crop prematurely.
- Acreage issues were accompanied by hoarding at all levels – right from the farmers to the traders.

Impact

- As the jute sector provides direct employment to 3.70 lakh workers in the country and supports the livelihood of around 40 lakh farm families, closure of the mills is a direct blow to workers and indirectly, to the farmers whose production is used in the mills. West Bengal, Bihar and Assam account for almost 99% of India's total production.

India's Jute Industry

- India is the **world's biggest producer of jute**, followed by Bangladesh. Jute is **primarily grown in West Bengal, Odisha, Assam, Meghalaya, Tripura and Andhra Pradesh**.
- The **jute industry in India is 150 years old**. There are about 79 jute mills in the country, of which about 60 are in West Bengal along both the banks of river Hooghly.
- Jute production is a labour intensive industry. It employs about two lakh workers in the West Bengal alone and 4 lakh workers across the country.

Jute as a crop and its benefits

- Jute is the only crop where earnings begin to trickle in way before the final harvest. The seeds are **planted between April and May and harvested between July and August**.
- The leaves can be sold in vegetable markets for nearly two months of the four-month jute crop cycle. The tall, hardy grass shoots up to 2.5 metres and each part of it has several uses.
- The **outer layer of the stem produces the fibre that goes into making jute products**. But the leaves can be cooked, the **inner woody stems can be used to manufacture paper and the roots**, which are left in the ground after harvest, improve the yield of subsequent crops.
- Compared to rice, **jute requires very little water and fertiliser**. It is largely pest-resistant, and its rapid growth spurt ensures that weeds don't stand a chance.
- To top it all, the **monetary returns on jute are twice that of paddy**. An acre of land produces approximately nine quintals of fibre.
- Jute brings home higher returns compared to most cash and food crops, and it is also a massive winner on the sustainability front.
- Jute is the **second most abundant natural fibre in the world**. It has **high tensile strength, acoustic and thermal insulation, breathability, low extensibility, ease of blending with both synthetic and natural fibres, and antistatic properties**.
- Jute can be used: for insulation (replacing glass wool), geotextiles, activated carbon powder, wall coverings, flooring, garments, rugs, ropes, gunny bags, handicrafts, curtains, carpet backings, paper, sandals, carry bags, and furniture.
- A 'Golden Fibre Revolution' has long been called for by various committees, but the jute industry is in dire need of basic reforms.

Problems of Jute Industry in India

The major problems of Indian Jute Industries are mentioned below:

- **High cost of production:** Equipments for production are all worn out, outmoded in design. Many mills are uneconomic. Products are made costlier.
- **Storage of raw Jute:** Jute industry suffers from inadequate supply of raw jute.
- **Shortage of Power Supply:** Load-shedding creates problem of under-utilization of capacity.
- **Growth of Jute mills in Bangladesh and loss of foreign market:** Newly started jute industry in Bangladesh has captured some of the market of Indian jute goods.
- **Emergence of substitute goods against gunny bags and loss of demand for jute goods both at home and abroad:** Indian jute goods have been losing ground in the world market primarily due to keen competition from synthetic substitutes and also supplies from Bangladesh and China.
- **Effects of Partition:** Due to Partition in 1947, the erstwhile best quality jute-producing areas went to the then East Pakistan (now Bangladesh) while the jute mills were mainly concentrated in the Indian Territory. Bangladesh received 82% of the good quality jute growing tract India retained 95% of the mills. The resultant acute shortage of raw jute forced some of the mills to close down.
- **Stiff Competition:** Bangladesh, Sri Lanka, Thailand and China are recently posing grave threat to India in international export market.
- **Low Yield Per Acre:** India produces very low quantity of jute per unit of land. In Bangladesh the average yield per hectare is 1.62 tonnes. It is only 1.3 tonnes per hectare in India. The corresponding figure of jute production in China is 1.78 tonnes per hectare. In Taiwan, it is 2 tonnes per hectare.
- **Outmoded Mills and Machinery:** Most of these jute mills were established some 100 or 150 years back. Naturally most of these mills are having backdated machinery. Output of these machines is very low compared to the modern sophisticated machines. Because of use of these for more than a century, productive capacity has gradually declined.
- **Low Demand:** Not many people are aware of plastic alternatives like jute. Besides, the misconception that cotton bags are more durable, presentable and nature friendly has resulted in very few people using jute products.
- **Pandemic:** The coronavirus pandemic has also thwarted hopes of restoring the lost glory of the industry – several mills have shut down and lockdowns have caused labour and raw material shortages.

Steps taken by the Government

The following measures have been taken for improving the Jute mills.

- **Mandatory use of Jute goods:** Mandatory use of Jute bags in food grains and sugar, cement and in fertilizers.
- **Modernization and Rationalization:** Modernization and rationalization of Jute mills have been undertaken.
- **Nationalization of 'sick' Jute mills:** The National Jute Manufacture Corporation Limited (NJMC) under the Ministry of Textiles has taken over the management of sick Jute mills.
- Under the **Jute Packaging Materials (Compulsory Use in Packing Commodities) Act 1987 (JPMA)**, the government is required to consider and provide for the compulsory use of jute packaging materials for supply. Under unusual circumstances, the central government can allow the use of plastic bags as an alternative for up to 30% of the total requirement for food grains.
- Whenever the market price of raw jute falls below a certain level, **the Jute Corporation of India (JCI) procures raw jute at Minimum Support Price (MSP)**, fixed on the basis of recommendation of the commission for Agricultural Cost and Prices (CACP), from jute growers to safeguard their interest.
- **Incentive Scheme for Acquisition of Plants and Machinery (ISAPM):** Government of India launched ISAPM for Jute Industry and Jute Diversified Products Manufacturing Units in 2013. The basic aim of this scheme is to facilitate modernization in existing and new jute mills and up-gradation of technology in existing jute mills and to provide assistance to a large number of entrepreneurs to manufacture value added biodegradable Jute Diversified Products (JDP) as well as for modernization Jute up-gradation of technology.
- **Jute-ICARE (Jute: Improved Cultivation and Advanced Retting Exercise):** This pilot project launched in 2015 is aimed at addressing the difficulties faced by the jute cultivators by providing them certified seeds at subsidized rates, seed drills to facilitate line sowing, nail-weeders to carry out periodic weeding and by popularizing several newly developed retting technologies under water limiting conditions. This has resulted in increased returns to jute farmers.
- The **National Jute Board** implements various schemes for market development, workers' welfare and promotion of diversification and exports.
- Government issued a notification in 2017 imposing **Definitive Anti-Dumping Duty on jute goods originating from Bangladesh and Nepal**.
- Government has made it **mandatory** for the entire chain from importers and traders to the level before the end-users, **to register with the Office of Jute Commissioner, and furnish monthly reports on the imported goods**.
- Government through its Office of Jute Commissioner, Kolkata has also **directed all manufacturers, importers processors and traders to mark/ print/ brand the words "Made in- Country of Origin" on imported bags**. Customs have also been requested to maintain a strict vigil so that no unregistered importers/ traders can import jute and no unbranded jute goods can enter India.

Way Ahead

- **India can cater to global demand** but for that two things are needed: **upgrading the skills of the people** to produce different types of products and **upgrading the machinery**.
- The need of the hour is to **upgrade and adopt new technology**, and manufacturing standards and evolve with time. Jute needs to **diversify its offering into non-packaging segments** because it has tremendous potential and uses apart from packaging.
- Jute-based lifestyle **products can be produced on a large scale and then sold online across e-commerce companies** in India and even exported to neighbouring countries. It will help the ailing industry and support the rural economy and empower women.
- There is a need for **training centres and skills upgrades** for increased productivity and improved jute products. Since 2011, no major wage revision had been undertaken in the jute industry. **Implementation of the Minimum Wages Act**, is the need of the hour.
- **All stakeholders, including governments, industry bodies, media, and the jute mill associations, have to work in tandem** to revive the industry and create public awareness about the use of jute products. The modernisation of jute mills and introducing technology for efficiency will revive the jute industry.
- While the Government can bring forward a policy to aid jute production, we all need to promote products made from Jute to make it more mainstream. In contrast, industry bodies and workers need to adapt to new technology and diversify product offerings.

STABLE COINS

GS-III ECONOMY

Context

- Crypto critics are using the collapse of dollar-pegged virtual currency Terra USD as ammunition to attack stable coins and the crypto industry as a whole.

What is Stable coin?

- A stable coin is a digital currency that is **pegged to a "stable" reserve asset like the U.S. dollar or gold.**
- Stable coins are designed to reduce volatility relative to unpegged cryptocurrencies like Bitcoin.

Details

- A stable coin is one type of cryptocurrency that is designed to maintain a fixed value over time. The value of a stable coin is typically pegged to a specific real currency, often the U.S. dollar.
- In this setup, one unit of the cryptocurrency typically equals one unit of the real currency. Unlike highly volatile cryptocurrencies such as Bitcoin, the price of stable coins is not meant to fluctuate.

Importance

- Digital currencies like **Bitcoin and Ethereum are tremendously volatile**, which makes pricing things in their terms very difficult. Stable coins avoid this issue by locking their prices to a known reserve currency.
- In addition, their stability allows many stable coins to be used as a functional currency within a crypto brokerage. For example, traders might convert Bitcoin into a stable coin such as Tether, rather than into dollars.
- **Stable coins are available 24/7**, making them more accessible than cash obtained through the banking system, which is closed overnight and on weekends.
- Stable coins **can also be used with smart contracts**, which are a kind of electronic contract that is automatically executed when its terms are fulfilled. The stability of the digital currency also helps circumvent disagreements that could arise when dealing with more volatile cryptocurrencies.

What are the risks of stable coins?

- **Security:** Like other cryptocurrencies, stable coins must be held somewhere, whether digital wallet or with a broker or exchange. And that presents risks since a given trading platform may not be secure enough or may have some vulnerabilities.
- **Counterparty risk:** While it may seem like cryptocurrency is highly decentralized, in reality one has to deal with several parties in a transaction, including the bank holding the reserves and the organization issuing the stable coin. They must be doing the right things (security, properly reserving, etc.) for the currency to maintain its value.
- **Reserve risk:** A key element of the stable-coin ecosystem are the reserves backing a stable coin. Those reserves are the last backstop on a stable coin's value. Without them, the coin issuer cannot guarantee the value of a stable coin with full confidence.
- **Lack of confidence:** If a stable coin is not sufficiently backed by hard assets, especially cash, it could suffer a run and lose the peg against its target currency. That's effectively what happened to the algorithmic stable coin Terra USD in May 2022, since it wasn't backstopped by cash but rather by other cryptocurrencies. The price of the stable coin broke and spiraled downward, as traders lost confidence in its ability to maintain the peg.

Bottom line

- Stable coins provide some of the stability that is lacking in most cryptocurrencies, making them unusable as actual currency. But those using stable coins should know the risks they're taking when they own it. While in most periods it may seem like stable coins have limited risks, stable coins may become the riskiest in a crisis when it ought to be the safest to own them.

OPEN NETWORK FOR DIGITAL COMMERCE

GS-III ECONOMY

Context

- Microsoft has become the first big tech company to join the government-backed Open Network for Digital Commerce.

About ONDC

- Open Network for Digital Commerce, abbreviated ONDC, is a **private non-profit Section 8 company established by the Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry of Government of India to develop open e-commerce.**
- It was **incorporated in 2021 with initial investment from Quality Council of India and Protean eGov Technologies Limited** (formerly NSDL e-Governance Infrastructure Limited).
- Often referred to as the UPI of e-commerce, ONDC is a freely accessible government-backed platform that aims to democratize e-commerce by moving it from a platform-centric model to an open network for buying and selling goods and services.

Aim

- The ONDC (Open Network for Digital Commerce), is **an initiative aiming at promoting open networks for all aspects of exchange of goods and services over digital or electronic networks.**

- Open Network for Digital Commerce (ONDC) is being seen as a step in the direction of **democratizing the e-commerce space in India, mainly controlled by multinational players Amazon and Flipkart.**

What led to the creation of ONDC?

- Technological self-reliance, demand for level playing field mainly from small retailers, smoothen the ease of doing business online, adoption of open digital ecosystem across key sectors and fixing the non-competitive behavior of big ecommerce firms like Amazon and Flipkart to capture the US\$810 billion domestic retail market led to the creation of ONDC.
- It will also help check Big Tech companies violating Consumer Protection (E-Commerce) (Amendment) Rules, 2021 due to concentration of market power by integrating them into a decentralized open-source platform.

Major Objectives

The major objectives include

- Ending monopolies of the platforms
- Democratisation and decentralisation
- Digitisation of the value chain
- Standardisation of operations
- Inclusivity and access for sellers, especially small and medium enterprises as well as local businesses
- Increased efficiency in logistics
- More choices and independency for consumers
- Ensured data privacy and confidentiality
- Decreased cost of operation
- It is compared to unified payments interface (UPI)

Key Features

- Unlike the platform-based model, the ONDC will not be owned or controlled by a single entity or platform.
- Businesses and consumers will be able to carry out transactions over ONDC using any compatible application of their choice.

ONDC Advisory Council

- **About:** The primary role of the advisory council is **to watch over ONDC implementation in the country.**
- **Member and Convener:** The members were selected based on their experience in fields such as technology, finance, commerce etc. Convener of the ONDC Advisory Council is Additional Secretary from Department for Promotion of Industry and Internal Trade under Ministry of Commerce and Industry.

Structure

- The ONDC uses "free software methodology, open specifications and open network protocol".
- The backend of the ONDC is built on Bechn Protocol, an open and interoperable protocol for decentralized digital commerce. Bechn Gateways provides anonymised aggregated data generated from the network.
- On the ONDC, the consumers and merchants can transact for goods and services via open protocol instead of the central platform or application.

GUIDELINES TO REGULATE DIGITAL LENDING

GS-III ECONOMY

Context

- The Reserve Bank of India (RBI) issued the first set of guidelines for digital lending, to crack down on illegal activities by certain players. This follows the recommendation of a Working Group on Digital Lending that had submitted its report recently.

What is Digital Lending?

- Digital lending is a process of quick loan disbursement through electronic medium. It is considered as the most effective, convenient, and faster way to disburse loans as compared to the traditional method.
- With the maturing of the digital ecosystem and enhanced use of analytics, automation, and blockchain the lending financial institutions rely more on algorithms and automated processes for loan approvals and disbursements.

Benefits of Digital lending

- There has been a definite shift from the traditional mode of lending to digital lending in the recent past.
- It is attributable to the fact that the digital mode of lending offers many benefits that may not be found in traditional mode.

New norms

- As per the new norms, all loan disbursements and repayments will be required to be executed only between the bank accounts of the borrower and the Regulated Entities (RE) - such as a bank or a non-banking financial company - without any pass-through or pool account of the Lending Service Providers or any third party.
- Stating that digital lending channels had become prominent recently, the RBI said concerns had also emerged which, "if not mitigated, may erode the confidence of members of the public in the digital lending ecosystem."
- The concerns relate to 'unbridled engagement of third parties, mis-selling, breach of data privacy, unfair business conduct, charging of exorbitant interest rates, and unethical recovery practices.
- "A standardised Key Fact Statement must be provided to the borrower before executing the loan contract," the RBI said in a circular. The norms prohibit any automatic increase in credit limit without borrowers' consent.
- They also allow a cooling-off period in which borrowers can exit loans by paying the principal and the proportionate annual percentage rate (APR) sans penalty.
- The framework is based on the principle that the lending business can be carried out only by entities regulated either by the Reserve Bank or entities permitted to do so under any other law, RBI added.

Future of Lending is Digital

- The industry has been alerted by Covid-19 to the tremendous potential of digital transformation. As customer demand for contactless transactions rises, more lenders will adopt technology to provide borrowers with maximum convenience.
- Even traditional banks and non-banking financial companies (NBFCs) are realizing the need to digitize processes such as customer onboarding, risk assessment, loan underwriting, disbursement, and repayment in order to reduce operational costs and enhance the customer experience.
- With services such as video-KYC, Aadhaar-based KYC, and websites and applications with cutting-edge functionalities, loan application procedures will become more efficient and less cumbersome.
- Additionally, the traditional credit underwriting procedure will undergo a radical transformation. Lenders will increasingly utilize cutting-edge technologies such as AI, ML, and big data analytics to collect and evaluate data from multiple sources in order to evaluate the creditworthiness of an applicant more quickly and efficiently.
- With the technology that enables alternative credit scoring, lenders can extend credit to a greater number of individuals, thereby advancing the cause of financial inclusion.
- In the coming years, technology will continue to disrupt the digital lending ecosystem, with a renewed emphasis on delivering an improved end-to-end customer experience.

ETHANOL BLENDING

GS-III ECONOMY

Context

- Prime Minister Narendra Modi announced that India has achieved its target of blending 10% sugarcane-extracted ethanol in petrol, ahead of schedule.

Biofuels

- Biofuels are **liquid or gaseous fuels primarily produced from biomass — that is, plant or algae material or animal waste.**
- Biofuels can be used to replace or can be used in addition to diesel, petrol or other fossil fuels for transport, stationary, portable and other applications.
- Ethanol and biodiesel are the two main transport biofuels. These fuels can be produced from a variety of biomass.

Categories of biofuels

- **First generation biofuels** - First-generation biofuels are made from sugar, starch, vegetable oil, or animal fats using conventional technology. Common first-generation biofuels include Bioalcohols, Biodiesel, Vegetable oil, Bioethers, Biogas.
- **Second generation biofuels** - These are produced from non-food crops, such as cellulosic biofuels and waste biomass (stalks of wheat and corn, and wood). Examples include advanced biofuels like biohydrogen, biomethanol.
- **Third generation biofuels** - These are produced from micro-organisms like algae.
- **Fourth generation biofuels** - These are produced from genetically modified (GM) algae to enhance biofuel production.

India's Biofuel Economy

- India is one of the fastest growing economies and the third largest consumer of primary energy in the world after the US and China.
- India's fuel energy security will remain vulnerable until alternative fuels are developed based on renewable feedstocks.
- The government of India targets reducing the country's carbon footprint by 30-35% by the year 2030.
- These targets will be achieved through a five-pronged strategy which includes:

1. Increasing domestic production
 2. Adopting biofuels and renewable
 3. Implementing energy efficiency norms
 4. Improving refinery processes and
 5. Achieving demand substitution.
- The government of India has proposed a target of **20% blending of ethanol in petrol and 5% blending of biodiesel in diesel by 2030** and introduced **multiple initiatives to increase indigenous production of biofuels.**

Benefits of India's ethanol blending mandates include

- **Reduce Import Dependency:** Will save Foreign Exchange (FOREX).
- **Cleaner Environment:** Reducing crop burning and converting agricultural residues/wastes to biofuels will further reduce greenhouse gas (GHG) emissions.
- **Health Benefits:** Prolonged reuse of cooking oil for preparing food, particularly in deep-frying, is a potential health hazard and can lead to many diseases. Used cooking oil (UCO) is a potential feedstock for biodiesel and its use for making biodiesel prevents reuse of UCO within the food industry.
- **Solid Waste Management:** There are technologies available, which can convert solid waste and plastics to drop-in fuels.
- **Infrastructural Investment in Rural Areas:** Establishing additional 2G biorefineries across the country will spur infrastructural investment in rural areas.
- **Employment Generation:** 2G biorefinery can contribute 1200 jobs across plant operations, village level entrepreneurs and supply chain management.
- **Additional Income to Farmers:** By adopting 2G technologies, agricultural residues/wastes that otherwise are burnt can be converted to ethanol. Farmers can realise an additional revenue source if markets are developed for these residues/wastes.

Major programs supporting the development of biofuels production and use in India

Background

- In India, the **Ethanol Blending Programme in 2003 was the first significant policy step related to liquid biofuels. It mandated a five-percent blending rate for ethanol in petrol.**
- The Biofuel Policy, implemented in 2009, was more ambitious, mandating a 20-percent blending rate for both ethanol and by 2017. The 2009 policy also **moved beyond molasses-based ethanol production to the direct use of sugarcane juice.**
- The 2009 Policy also outlined a clear pathway for biodiesel production, utilising non-edible oils – specifically, Jatropha Curcus.
- Despite these measures, ethanol production remained low in the ensuing years. Issues in the **sugarcane supply chain prevented production, and oil-marketing companies were unable to get bids for most of the amount offered for purchase.**
- This prompted a slew of measures in the next few years, including the **reintroduction of administered minimum support price and the opening up of alternate routes for ethanol production.**
- By 2018, blending rates reached around four percent, followed by a faster uptake in the subsequent years.
- **'Pradhan Mantri JI-VAN (JaiVandhan- Vatavaran Anukoolfasalawashesh Nivaran) Yojana'**
- **Viable gap funding (VGF)** for commercial scale 2G ethanol plants under **'Pradhan Mantri JI-VAN.**
- It is a tool to create 2G ethanol capacity in the country and attract investments in this new sector.
- Financial assistance for demonstration scale 2G integrated bioethanol under Pradhan Mantri JI-VAN Yojana.
- Grants for research and development from Direct Benefit Transfer to 5 Centres for Excellence in the Bioenergy area.

Biogas Power Generation and Thermal Energy Application Programme (BPGTP)

- The programme promotes biogas based Decentralized Renewable Energy Sources of power generation (Off-Grid), in the capacity range of 3 kW to 250 kW or thermal energy for heating/cooling applications from the biogas generation produced from Biogas plants of 30 M3 to 2500 M3 size.

New National Biogas and Organic Manure Programme (NNBOMP)

- The objective is to provide clean cooking fuel for kitchens, lighting and meeting other thermal and small power needs of farmers/dairy farmers/users including individual households and to improve organic manure system based on bio-slurry from biogas plants in rural and semi-urban areas by setting up of small size biogas plants of 1 to 25 Cubic Metre capacity.

Sustainable Alternative Towards Affordable Transportation (SATAT)

- The government is promoting the use of Compressed Bio Gas (CBG) also known as BioCNG. In a significant push that has the potential to boost the availability of more affordable transport fuels, better use of agricultural residue, cattle dung and municipal solid waste as well as to provide an additional revenue source to farmers, an innovative initiative titled SATAT i.e., Sustainable Alternative Towards Affordable Transportation initiative was brought up in 2018.
- Under this initiative, Oil PSUs IOCL, HPCL, BPCL, GAIL and IGL have invited Expression of interest (Eoi) from potential entrepreneurs to procure CBG.

Ethanol Blended Petrol (EBP)

- On the occasion of World Environment Day, 2021, Prime Minister Narendra Modi, launched the ambitious E100 pilot project in Pune for the production and distribution of ethanol across the country. The aim is to promote biofuels for a better environment.
- The government resolved to meet the target of **20 per cent ethanol blending in petrol by 2025**. Earlier the target was set for 2030. Currently, the ethanol blending level in petrol is around 8.5 per cent.

Financial assistance

- Government has notified scheme for extending **financial assistance to project proponents for enhancement of ethanol distillation capacity or to set up distilleries for producing first Generation (1G) ethanol from feed stocks** such as cereals (rice, wheat, barley, corn & sorghum), sugarcane, sugar beet etc. vide notification dated January 1, 2021.
- Under the scheme, government would bear **interest subvention for five years, including one year moratorium, against the loan availed by project proponents from banks @ 6 per cent per annum or 50 per cent of the rate of interest charged by banks, whichever is lower.**
- This loan would be for setting up of new distilleries; expansion of existing distilleries; converting existing distilleries to dual feedstock; setting up of new dual feed distilleries; expansion of existing dual feed distilleries; and installation of Molecular Sieve Dehydration (MSDH) column etc.

National Policy on Biofuels - 2018

- The 'National Policy on Biofuels 2018' was notified by the Ministry of Petroleum and Natural Gas in 2018 in supersession of National Policy on Biofuels, promulgated through the Ministry of New & Renewable Energy in 2009.
- It provided an **indicative target of blending 20% ethanol in petrol by 2030**.
- NITI Aayog "Roadmap for Ethanol Blending in India 2020-25" report outlines the journey for 20% ethanol blending in the country.

The policy was drafted to help in meeting the target of reducing import dependence on fossil fuels by 10 per cent from 2014-15 levels by the year 2022. This target is to be achieved by adopting a five-pronged strategy which includes, increasing domestic production, adopting biofuels & renewable, energy efficiency norms, improvement in refinery processes and demand substitution. As of 2021, the Government of India claims a blending rate of 8.1 percent

Amendments approved to the National Policy on Biofuels, 2018

- In 2021-22, there has been a pivot from the policy articulated in 2018. The GOI has announced a scaling up of its ethanol blending ambitions – most notably, the deadline for achieving a 20 percent blending rate for ethanol has been set at 2025.
- To enable faster transition, the **Union government has doubled down on 1G biofuels.**
- In addition to sugar-based production, the use of food grains has been allowed**, which includes maize as well as surplus rice from Food Corporation of India (FCI) stocks.
- The **loan interest subvention scheme has also been expanded, to include grain-based distilleries apart from sugar or molasses-based distilleries.**
- The recently constituted "Expert Committee on Roadmap for Ethanol Blending in India by 2025," has outlined a reconfigured approach to meeting the new targets that requires **13.5 billion litres of ethanol to be produced by 2025 – a sixfold increase from the 2.7 billion litres produced in 2021.**
- The plan is to obtain 6.8 billion litres from sugarcane and 6.6 billion litres from food grains, which will have a significant impact on the agriculture sector.

The following are the main amendments approved to the National Policy on Biofuels

- To **allow more feedstocks for production of biofuels,**
- To advance the ethanol blending **target of 20% blending of ethanol in petrol to 2025-26 from 2030,**
- To promote the **production of biofuels in the country, under the Make in India Program**, by units located in Special Economic Zones (SEZ)/ Export Oriented Units (EoUs). This proposal will attract and foster developments of indigenous technologies which will pave the way for the 'Make in India' drive and thereby generate more employment,
- The amendments have also called for **adding more members to the National Biofuel Coordination Committee (NBCC), which is chaired by the Union Minister of Petroleum And Natural Gas** and has members from 14 other ministries.
- To grant **permission for export of biofuels in specific cases,** and
- To delete/amend certain phrases in the policy in line with decisions taken during the meetings of National Biofuel Coordination Committee.

Significance of the amendments

- The existing National Policy on Biofuels came up during the year 2018. This amendment **proposal will pave the way for 'Make in India' drive thereby leading to reduction in import of petroleum products.**
- Since many more feedstocks are being allowed for production of biofuels, **this will promote the Atmanirbhar Bharat and give an impetus to Prime Minister's vision of India becoming 'energy independent' by 2047.**

Policy Recommendations

- For a sustainable transition, the **long-term biofuel pathway should be based on waste (2G) and algal biomass (3G)**. Such approaches **will ensure reductions not only in oil imports but also in carbon emissions**.
- Furthermore, a **waste-based pathway will ensure higher levels of biofuel production**, since a larger part of the biomass can be apportioned for fuel production, **without posing a threat to food security and land**.
- In the long run, **waste-based biofuels will also be cheaper for consumers**, since the raw materials are cheaper than edible feedstock.
- In India, the cost of ethanol is significantly higher than in other countries, due to government-regulated pricing of agricultural commodities. It can also be an **effective solution to the problem of air pollution arising from the burning of agricultural wastes**.
- Currently in India, Biofuel development is centred around the cultivation of Jatropha plant seeds. There is **need to develop new feedstock for biofuels**.
- To facilitate the blending of biofuels with conventional fuels, there is **need to set up advanced biorefineries**.
- **Research and development should be promoted to support generation of bio-fuel from waste**. As it will ensure realizing the goal of waste management and waste to energy.

PRIVATIZATION OF BANKS

GS-III ECONOMY

Context

- Big bang privatisation of public sector banks can do more harm than good, an RBI article has warned.

Brief History of Banks in India

- **"The Bank of Hindostan", established in 1770, was the first Bank of India** which ran for about 60 years and soon failed.
- The modern day **"State Bank of India" was established in 1806 and was first named "Bank of Calcutta"**. It was later renamed as the **"Bank of Bengal"** by the British Government. Soon this bank merged with **"Bank of Madras"** and **"Bank of Bombay"** and formed a **new bank called "Imperial Bank of India"**.
- **"Reserve Bank of India (RBI)"** which is the central banking institution in India, was established on 1st April 1935 with the RBI act 1934. In succeeding years, India got many other private banks working well with the economy.
- The Government of India took a step to **nationalize the 14 major banks of India in 1964 after independence**.
- After the 6 years, 6 more banks were nationalized in 1970 and thus we got 20 nationalized banks in India but soon
- **"The New Bank of India" merged with the "Punjab National Bank" and now we have all over 19 nationalized banks in India.**

Public Sector and Private Sector Banks

- A public sector bank is a bank in which the majority of its stake is held by the Government like -SBI. The Public Sector Banks are classified into two groups as:
 1. Nationalized Banks
 2. State Bank and Associates
- On the other hand, a private sector bank is a bank in which the majority of the shares of the bank are under the control of its share holders like the HDFC Bank and the Axis Bank. There are currently 22 Private Sector Banks working in India.

Privatization

- Privatization refers to the process by which the private sector assumes operational or financial control of public institutions.
- In other words, privatization entails the **abolition of all government controls and involvement in the establishment of supply and demand mechanisms**.

Background: Bank Nationalization

- Bank nationalization ushered in a revolution for India's banking sector.
- Before nationalization, barring the State Bank of India, most **banks were privately owned and they largely benefited the rich and the powerful**.
- The **nationalization of 14 private banks in 1969**, followed by six more in 1980, **transformed the banking sector, created jobs, extended credit to the agriculture sector and benefited the poor**.
- Areas that had so far been neglected, including agriculture, employment-generating productive activities, poverty alleviation plans, rural development, health, education, exports, infrastructure, women's empowerment, small scale and medium industry, and small and micro industries, became priority sectors for these banks.

Importance of Public Sector Banks

- PSBs are **vehicles of the Indian economy's growth** and development, and they have become the **trustees of people's savings and confidence**.
- The PSBs played a huge role in making the country **self-sufficient by supporting the green, blue, and dairy revolutions**. They have also contributed significantly to infrastructural development.
- Public sector banks in India are currently earning **considerable operating profits**, to the tune of Rs. 1,74,390 crore in 2019-20 and Rs. 1,49,603 crore in 2018-19.

Issues faced by Indian public sector banks

- High Non-performing assets ratio
- Managerial efficiency
- Political interference
- Poor performance of Insolvency and Bankruptcy Code and National Company Law Tribunals (NCLT)
- High Capital to Risk-weighted Assets Ratio (CRAR): Impractical for Banks
- Problem of high loan write-offs.
- Willful Defaulters.
- Corruption

Arguments for Privatization of Banks

Many Organizations conducted surveys and found that the privatization of the Banks will result in positive outcomes. It led the Government to re-think about the privatization of all the Banks. Let's see why privatization of Indian Banks has become indispensable for the Government of India:

- It is found that the Private sector banks are more advanced than Public sector Banks and are also **working more efficiently**.
- The **foreign investors prefer to invest in private sector banks** rather than the public sector banks.
- The private sector banks are much **strict against loans and frauds**.
- Public Sector banks are usually less **competitive** than the private sector banks.
- Private sector banks are obedient and quite serious towards their work and responsibility that is lacking in most of the Public sector banks.
- The private sector banks **follow the concept of lowest risk**.
- Privatization will also help to **reduce the burden of the Government of India**.
- Privatization of banks **will deter government influence & control and aids economic growth. (Lack of Political Influence)**
- Privatization attracts public investments and FDI's.

Arguments against Privatization of Banks

- The privatized banks **will focus on maximizing their benefit** and it will put an **adverse effect on the middle class and poor** people of the society.
- Every organization, whether government sector or private sector, has some issues within its structure. It is **not necessary that a private sector bank will never go with any fraud**.
- The public sector banks usually work on social welfare while the **motive of private sector banks is generation of profit**.
- Many government schemes like "Jan-DhanYojna" and "Pension Yojna" worked well and also became successful only **because they were applied in Public Sector Banks**.
- Another disadvantage of privatization is **nepotism which will affect the banking services**.
- **Loss of Jobs:** Employees are concerned that they may lose jobs due to the privatization of banks.
- Private sector banks **can exit the market at any time**.
- **SC/ST/OBC** categories may **lose reservation benefits**.
- **High service charges** on transactions and other services.
- **Limited safety and security.** All India Bank Officers Confederation claimed that Indian Citizens prefer safety and security of their money deposits that is offered by Public Sector Banks.
- Public sector banks' coverage of rural areas was far better than their private sector counterparts.
- Private Banks **can never match PSBs in the real sense, due to PSBs' higher risk-taking capacity** and the dual nature of their profitability — social and commercial profits.
- The **Nationalized Banks have bailed out the failing private banks**. Twenty-five private banks were merged with PSBs from 1969 to 2020 as per AIBEA's compilation; the **YES Bank's bailout by the State Bank of India is the latest example**.

Recent findings of RBI

- While private sector banks (PVBs) are more efficient in profit maximisation, their public sector counterparts have done better in promoting financial inclusion.

- The gradual approach to privatisation adopted by the government can ensure that a void is not created in fulfilling the social objective of financial inclusion and monetary transmission.
- PSBs (Public Sector Banks) have played a key role in catalysing financial investments in low-carbon industries, thereby promoting green transition in countries such as Brazil, China, Germany, Japan, and in the European Union.
- Evidence suggests that public sector banks are not entirely guided by the profit maximisation goal alone and have integrated the desirable financial inclusion goals in their objective function unlike private sector banks.
- RBI's results point out the countercyclical role of PSB lending. In the recent years, these banks have also gained greater market confidence. Despite the criticism of weak balance sheets, data suggests that they weathered the Covid-19 pandemic shock remarkably well.

Way Ahead

- Banks are the backbone of the economy. The **Indian Constitution** says "Every economic activity in the nation should be centred at the welfare of the people" but, privatization might violate this concept because Private Bank will aim at maximizing their own profit. Any large-scale privatization of public sector banks appears to be fraught with problems.
- There is an urgent and imperative need to bring in a **suitable statutory framework to consider willful defaults on bank loans a "criminal offence"**.
- The right solution for correcting the functioning of PSBs would be **putting in place better regulations and control mechanisms**.
- In the medium term, the **best solution is improving governance at public sector banks**.
- Stringent measures are required to recover **large corporate stressed assets**, which is a key concern for the entire banking sector. This must include **strong recovery laws and criminal action against willful defaulters**.
- Willful default by **large corporate borrowers** and **subsequent recovery haircuts**, imposed through the **ill-conceived Insolvency and Bankruptcy Code**, has resulted in a heap of **write-offs**, putting a big dent on the balance sheets of PSBs.
- This has not only affected the profitability of the banks, but has also become an **excuse to allege inefficiency**.
- A system to examine top executives of PSBs across the country will also help in improving accountability.
- But **privatization of PSBs is not a definitive panacea for the problems of the banking sector in India**.
- For the country to progress, it is important to **ensure that the modern banking facilities reach every inch of the country** and this is **possible only when operational efficiency is combined with a strong sense of service towards the nation**.

DIGITAL ECONOMY

GS-III ECONOMY

Context

- The draft of the revised data protection Bill will be released for consultation soon with the government planning to present it in Parliament during the Budget session next year, Minister for Telecom and IT Ashwini Vaishnaw said.

What is the digital economy?

- The digital economy refers to economic activity that uses electronic communication and digital technologies to provide goods and services. The main building blocks of the digital economy are
 1. **The internet.** This enables firms to offer goods for sale and enables consumers to browse for goods that they need.
 2. **E-mail.** Electronic communication enables very cheap, instantaneous communication across the world. It can be used to send information and requests very quickly.
 3. **Digital automation.** Firms can use the processing power of computers to make decisions on output, prices and how to reach consumers.
 4. **Digital payments** – credit cards, Apple Pay, Google pay, bitcoin, bank transfer. A digital economy is moving us towards a cashless society.
 5. **Automation.** Increasingly the digital economy relies on AI, mass use of electronic data and automated technology
 6. **Social media.** To a lesser extent, social media is an aspect of the digital economy. With individuals using it share recommendations about business.

Essential Elements of Digital Economy

- Digital Economy facilitates and executes the buying and selling of products and services through electronic transactions undertaken by means of the internet. Its essential elements are:
 1. Digitalization and using Information and Communication Technology (ICT), rigorously.
 2. Knowledge codification
 3. Conversion of information into commodities
 4. Organizing work and production in modern ways.

Hyperconnectivity, i.e. emerging interconnectivity of people, firms, systems, etc. as a result of the internet, mobile technology and Internet of Things (IoT).

Examples of the digital economy

- **Airbnb** – This enables tourists to book online. It has also made it possible for individual households to let out their house/room to tourists. Before the digital economy it was not practical.
- **E-commerce site: Amazon market place/Ebay.**
- **Netflix** – This enables consumers to purchase tv-series and films over the internet, without need for any physical good.

Some Initiatives taken to digitize India

Infrastructure

Under this initiative, the Government provides multiple programs that facilitate a reliable digital infrastructure. The following are some of the programs under this:

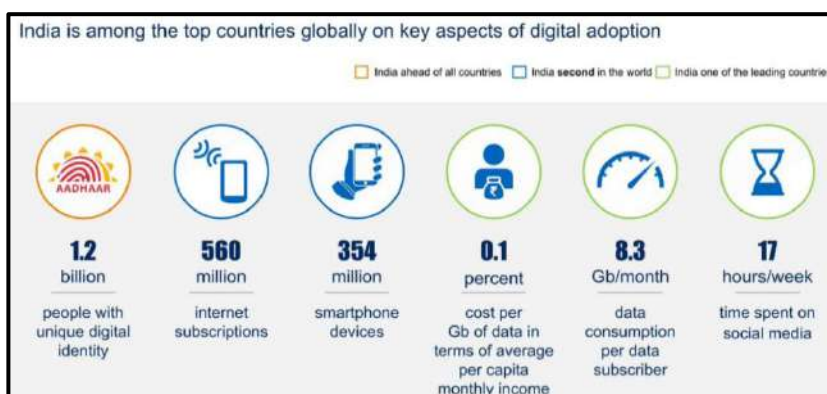
- **AADHAR:** One of the key strengths of 'Digital India', wherein every resident of the country is given a unique identity number.
- **Bharat Broadband Network (BBNL):** This is the custodian of Digital India. The creation of the National Optical Fiber Network (NOFN) has been mandated in India.
- **Centre for Excellence for Internet of Things (CoE-IT):** The main objective of the center is for creating domain capability and innovative applications.
- **CERT-IN:** This is formed with the intention to secure Indian cyberspace.
- **Common Services Centres (CSCs):** CSCs are the access points for the delivery of essential public utility services, healthcare, social welfare schemes, financial, education, and agriculture services.
- **Cyber Swachhta Kendra:** The purpose of this is to generate secure cyberspace by detecting botnet infections in India and to notify, enable cleaning, and secure systems of end-users so as to prevent further infections.
- **DeenDayalUpadhyaya Gram JyotiYojana:** This is one of the flagship programs of the Power Ministry (MoP) and is designed to provide a continuous power supply to the entire rural India.
- **DigiLocker:** A digital wallet to empower citizens digitally.
- **Digital SakshartaAbhiyaan (DISHA):** This aims to provide IT training to 52.5 lakh persons.
- **Digitize India Platform:** This platform provides digitization of scanned document images or physical documents.

Services

Under this initiative, the Government has introduced multiple online services to facilitate greater reach and accessibility:

- **Accessible India Campaign and Mobile App:** This nation-wide flagship campaign is for achieving universal accessibility for enabling people with disabilities to gain access to equal opportunity.
- **Agrimarket App:** This mobile application aims to keep farmers abreast with the crop prices and avoid distress sale.
- **BetiBachaoBetiPadhao:** This aims to provide equal opportunity to a girl child, a chance to be born and be educated.

The Digital economy	
Pros	Cons
<ul style="list-style-type: none"> • Greater information and choice • Saves time • Reduced costs for business • Greater personalisation • Lower barriers to entry • Greater flexibility in work, enabling people to work from home. • Benefits for developing world 	<ul style="list-style-type: none"> • Monopoly power of tech giants • Less community • Addictive nature of technology • Privacy issues • Bypassing of labour laws. • Disruption to traditional economy and jobs. • Potential environmental costs.



- **BHIM (Bharat Interface For Money):** This makes payment easy and quick using UPI.
- **Crime and Criminal Tracking Network & Systems (CCTNS):** This aims for nationwide networking infrastructure for the evolution of an IT-enabled state-of-the-art tracking system around 'Investigation of crime and detection of criminals.'
- **Crop Insurance Mobile App:** This app can be used to compute the insurance premium for notified crops based on the area of coverage, amount, and loan amount in the case of loanee farmers.
- **Digital AIIMS:** A distinctive health identification number for every patient visiting AIIMS was generated on an Aadhar platform.
- **E-Granthalaya, E-Panchayat, E-Hospital, E-Pathshala, E-prison:** All of these provide digitalization of services like libraries, hospitals, schools, and prisons.

Empowerment

Under this initiative, the Government provides e-governance, skill development, and infrastructure development initiatives:

- Aadhar Enabled Payment System (AEPS)
- BPO Scheme
- DigidhanAbhiyaan
- MyGov
- National Mission on Education using ICT
- North East BPO Promotion Scheme (NEBPS)
- NREGA - Soft
- OpenForge
- PayGov India
- Smart Cities
- Pradhan Mantri Jan- DhanYojana (PMJDY)
- Pradhan MantriKaushalVikasYojana (PMKVY)
- PAHAL (DBTL)
- Targeted Public Distribution System (TPDS)
- Visvesvaraya PhD Scheme For Electronics and IT

NATIONAL LABOUR CONFERENCE

GS-III ECONOMY

Context

- Prime Minister, Narendra Modi recently addressed the National Conference of Labour Ministers of all States and Union Territories via video conferencing.

The Conference

- The two-day conference has been organized by the Union Ministry of Labour and Employment on August 25-26 at Tirupati, Andhra Pradesh.
- The conference has been convened in the spirit of cooperative federalism to discuss various significant labour-related issues.
- It will help create further synergy amongst the Centre and state governments in formulating better policies and ensuring effective implementation of schemes for the welfare of workers.

Highlights of the Conference

- PM Modi said that **flexible workplaces, a work-from-home ecosystem and flexible work hours are the need of the future.**
- He said India's labour force has a huge role to play in realizing India's dreams and aspirations to build a developed nation in the AmritKaal, and with this thinking, **the country is working continuously for crores of workers from the organised and unorganised sector.**
- The Prime Minister reiterated the various efforts by the Government like **Pradhan Mantri Shram-Yogi Maandhan Yojana, Pradhan Mantri Suraksha Bima Yojana, Pradhan Mantri Jeevan Jyoti Bima Yojana** that have given a kind of security cover to the workers. These schemes have assured the labourers of the recognition of their hard work and contribution.
- The **Emergency Credit Guarantee Scheme**, according to a study, saved 1.5 crore jobs during the pandemic.
- The Prime Minister said that today India has once again become the fastest growing economy in the world, so a lot of credit goes to the workers.
- The Prime Minister pointed out that the **e-Shram portal is one of the key initiatives to bring the labour force into the ambit of social security.** In just one year, about 28 crore workers from 400 areas have been registered on the portal. This has especially benefited construction workers, migrant labourers, and domestic workers. He requested all the ministers to integrate state portals with the e-Shram portal.
- **29 labour laws have been converted into 4 simple labour codes.** This will ensure the empowerment of workers via minimum wages, job security, social security, and health security.
- PM emphasized **the need to take full advantage of the fourth industrial revolution** by taking quick decisions and implementing them rapidly.
- In the light of platform and **gig economy and online facilities**, the Prime Minister stressed that **right policies and efforts in this area will help in making India a global leader.**
- The Prime Minister highlighted that the country's Labour Ministry is **preparing its vision for the year 2047 in AmritKaal.**
- He said by making the right use of women power, India can achieve its goals faster. Prime Minister also emphasized the need to think in the direction of **what can be done for women in the newly emerging sectors in the country.**
- Remarking on the **demographic dividend of India**, the Prime Minister said that **India's success in the 21st century will depend on how well it is used.**
- India needs to take advantage of global opportunities by creating a high-quality skilled workforce.
- PM urged everybody to pay attention to **how ESIC together with the Ayushman Bharat scheme can benefit more and more work.**

SPACE DEBRIS

GS-III SCIENCE & TECHNOLOGY

Context

- Recently, China's Long March-5B rocket burned up after entering the atmosphere. But no damage has been reported from the debris that fell to the Earth.

Space junk and Space Debris

- "Space junk" is defined as artificial objects left by humans in space and which no longer serve a useful purpose.
- "Space debris," on the other hand, is a more general term referring to both meteoroids and orbital debris.

Status of Space Debris

- According to the European Space Agency, more than 9,300 tons of materials accumulated over 60 years of space activity are currently orbiting Earth.

Concerns associated

In-orbit risks

- Objects in Low Earth Orbit travel at speeds up to 10km/second - fast enough to cause significant damage to satellite, spacecraft, or spacewalking astronauts in case of a collision.

Kessler Syndrome

- The Kessler Syndrome is a theoretical scenario in which Earth's orbit is overpopulated with objects and debris, preventing the use of satellites in Earth's orbit- a Domino Effect. This idea was proposed by NASA scientist Donald Kessler in 1978.

Danger to space station

- The rising number of space debris increases the potential danger to all space vehicles, especially to the International Space Station (ISS).

Impact on weather monitoring

- The density of the junk may become so great that it could hinder our ability to use weather satellites, and hence to monitor weather changes.

Steps taken to tackle the problem

Liability Convention (1972)

- Outlines the liability of launching states for damage caused by their space objects on the Earth or in space, and procedures for the settlement of claims for damages.

Inter-Agency Space Debris Coordination Committee

- IADC is an inter-governmental forum whose aim is to co-ordinate efforts to deal with debris in orbit around the Earth founded in 1993.

COPUOS

- The United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) in 2019 adopted a set of 21 voluntary, non-binding guidelines to ensure the long-term sustainability of outer space activities.

NORAD

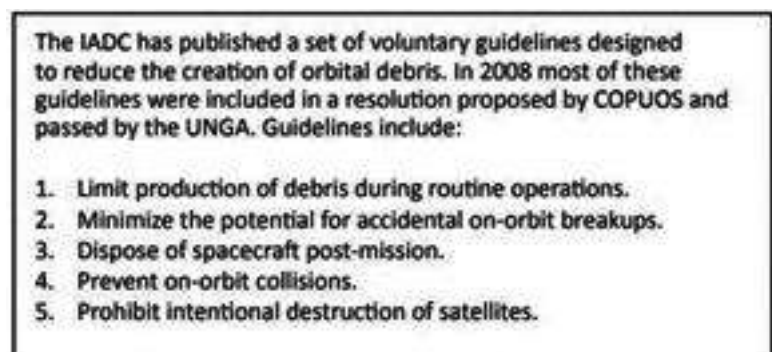
- North American Aerospace Defense Command, is an initiative of the U.S. & Canada that shares selective debris data with many countries.

ClearSpace-1 Mission

- In this a "chaser" with its four robotic arms will grab the leftover of 2013 craft known as VESPA (Vega Secondary Payload Adapter) and drag it down to Earth's atmosphere where both will burn up. To be launched in 2025.

Starship

- Space X Starship - the passenger-carrying spacecraft once ready can collect and de-orbit space junk apart as well.



Artemis Accords

- This accord ensures that space exploration is conducted in a safe, sustainable and transparent manner and in full compliance with international law.

"Astro Carta" for space sustainability

- The U.K. calls for an "Astro Carta" for space sustainability, based on the Artemis Accords model for sustainable space exploration.

NEO-01'

- China launched a low Earth orbit robot prototype called 'NEO-01'. It can scoop up space debris left behind by spacecraft with a big net.

ISRO's Efforts

'Project NETRA'

- ISRO has initiated 'Project NETRA' to monitor space debris. The domestic surveillance system would provide first-hand information on the status of debris, which would aid further planning on protecting space assets.

'SPADEX'

- 'SPADEX' looks at docking a satellite on an existing satellite, offering support in re-fuelling and other in-orbit services while enhancing the capability of a satellite. This would ensure the longevity of a mission and provide a futuristic option to combine missions/experiments.

Other

- In April 2022, India and the U.S. signed a new pact for monitoring space objects at the 2+2 dialogue.
- ISRO's GSLV employs passivation of the Cryogenic Upper Stage at the end of its useful mission.

Mitigation Measures and Way Ahead

- Developing Reusable spacecrafts.
- Designing and building spacecraft that can better withstand the harsh environment of space without disintegrating.
- Releasing stored energy and fuel so that defunct spacecraft don't explode.
- Once a spacecraft's mission is over, moving it to a safer orbit. That is - A "graveyard orbit" high above the low-Earth space.
- Bringing it down using laser into Earth's atmosphere to burn up on re-entry as a neat disposal system.
- Capture debris or de-orbit old satellites.
- Charge operators "orbital-use fees" for every satellite put into orbit.
- Careful choice of orbits.
- Performing 'collision avoidance manoeuvres'.
- Orbital lifetime reduction (accelerating the natural decay of space objects to reduce the time that they remain in orbit).
- International cooperation in the debris mitigation measures.
- Contributing to the efforts of the **Inter-Agency Space Debris Coordination Committee (IADC)** and **United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS)**.

Conclusion

- Multilateral efforts, alongside technological innovation, can ensure that the great space cleanup is well underway.

MINERALS SECURITY PARTNERSHIP (MSP)

GS-III SCIENCE & TECHNOLOGY

Context

- The US and 10 have come together to form the Minerals Security Partnership (MSP).

What is MSP?

- The Minerals Security Partnership (MSP) is an ambitious new initiative to bolster critical mineral supply chains, announced by the United States (US) and 10 key partner countries. However, **India is not a part of this partnership.**

Which Countries Are Part Of The Mineral Security Partnership?

- Australia, Canada, Finland, France, Germany, Japan, the Republic of Korea, Sweden, the United Kingdom, the United States, and the European Commission are part of the partnership.

Objective of MSP

- The goal of the MSP is to ensure that critical minerals are produced, processed, and recycled in a manner that supports the abilities of countries to realize the full economic development benefit of their geological grants.

What Are Critical Minerals?

- A critical mineral is a metallic or non-metallic element that is essential for the functioning of modern technologies, economics, or national security, has a supply chain at risk of disruption, and is used to manufacture advanced technologies.
- The advanced technologies which can be manufactured using critical minerals include mobile phones, computers, tablets, semiconductors, fibre-optic cables, and defense, aerospace and medical applications.
- Critical minerals such as copper, lithium, nickel, cobalt and rare earth minerals are essential components in the rapidly growing clean energy technologies such as wind turbines and electric vehicles. Critical minerals are essential for clean energy and other technologies, and the demand for these minerals is projected to expand significantly in the future.

Role of Critical Minerals in Clean Energy Transitions

- The critical minerals used in electric vehicles to improve battery performance include cobalt, manganese, and graphite. Permanent magnets used in wind turbines and electric vehicle motors require rare earth minerals. A huge amount of copper and aluminum is needed for the construction of electricity networks.
- A large number of minerals are required to build solar photovoltaic plants, wind farms, and electric vehicles.
- Countries are accelerating their efforts to reduce emissions, and hence, must make sure that energy systems remain resilient and secure. Since the importance of critical minerals is rising in a decarbonizing system, it has become essential for energy policy makers to expand their horizons.
- According to the International Energy Agency, critical minerals' share of total demand, in a scenario that meets the Paris Agreement goals, rises significantly over the next two decades to over 40 per cent for copper and rare earth minerals, 60 to 70 per cent for nickel and cobalt, and about 90 per cent for lithium. Electric vehicles and battery storage has become the largest consumer of lithium, displacing consumer electronics. By 2040, they are set to displace stainless steel to become the largest end user of nickel.

What Are The Risks To Critical Mineral Supply Chains?

- When production of critical minerals is dominated by individual countries or companies, critical mineral supply chains might be at risk, limiting availability. Market immaturity, social unrest, political decisions, mine accidents, natural disasters, geological scarcity, war, and pandemics are other factors which pose a risk to critical mineral supply chains.

Rare Earth Minerals

- Rare earth minerals are a set of seventeen metallic elements which include the scandium, yttrium, and the fifteen lanthanides on the periodic table. Rare earth minerals are an essential part of many high-tech devices.
- These minerals are necessary components of more than 200 products across a wide range of applications, especially high-tech consumer products such as computer hard drives, cellular telephones, flat-screen monitors and televisions, and electric and hybrid vehicles.

Dependency on China

- China is responsible for around half of the worldwide production of rare earth minerals.
- According to the US Geological Survey, 38 per cent of world production of rare earth minerals in 1993 was in China. However, by 2011, China accounted for 97 per cent of world production.
- Since 1990, supplies of rare earth minerals became an issue because the Chinese government began to change the amount of rare earth minerals it allows to be produced and exported, and also started limiting the number of Chinese and Sino-foreign joint venture companies that could export rare earth minerals from China.
- In 2019, the Democratic Republic of China (DRC) and the People's Republic of China (China) were responsible for about 70 per cent and 60 per cent of global production of cobalt and rare earth minerals respectively.
- China's share of refining is 50 to 70 % of lithium and cobalt, around 35 per cent for nickel, and nearly 90 per cent for rare earth minerals.
- Complex supply chains could increase the risks that might arise from trade restrictions in major producing countries.
- China - a major producer is subject to extreme heat/flooding. This poses greater challenges in ensuring reliable & sustainable supplies.

Significance of MSP

- The MSP is aimed at reducing dependency on China for rare earth minerals. The MSP group will aim to bolster the supply chains of critical minerals such as cobalt, lithium, nickel, gallium, and 17 Rare Earth minerals.
- The partnership will help catalyze investment from governments and the private sector for strategic opportunities that adhere to the highest environmental, social, and governance standards, across the full value chain.

Context

- DeepMind, a company has predicted the three-dimensional structures of more than 200 million proteins using AlphaFold.

What is AlphaFold?

- AlphaFold is an **AI-based protein structure prediction tool**. It is based on a computer system called **deep neural network**.

Deep Learning and Artificial neural network (ANN)

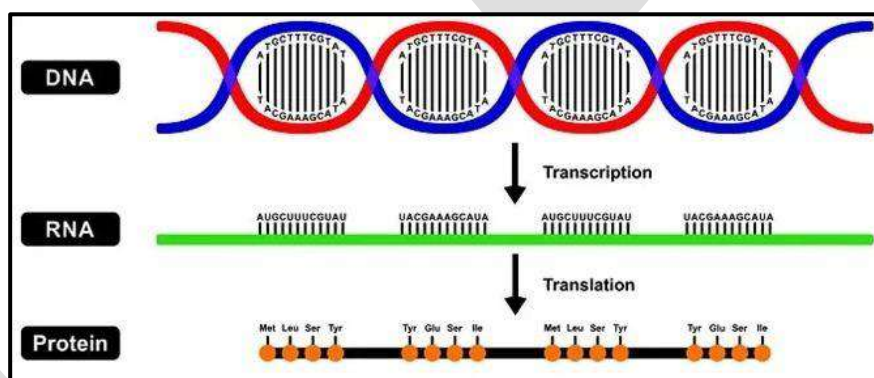
Deep Learning is a subset of Machine Learning, which on the other hand is a subset of Artificial Intelligence. Artificial neural network refers to a system or an algorithm used in deep learning that mimics how the human brain's neural circuits function, such as when making sense of things and events.

- Inspired by the human brain, neural networks use a large amount of input data and provides the desired output exactly like how a human brain would. The real work is done by the black box between the input and the output layers, called the hidden networks.
- AlphaFold is fed with protein sequences as input. When protein sequences enter through one end, the predicted three-dimensional structures come out through the other.

This DNA sequence can only be translated into one possible protein sequence:

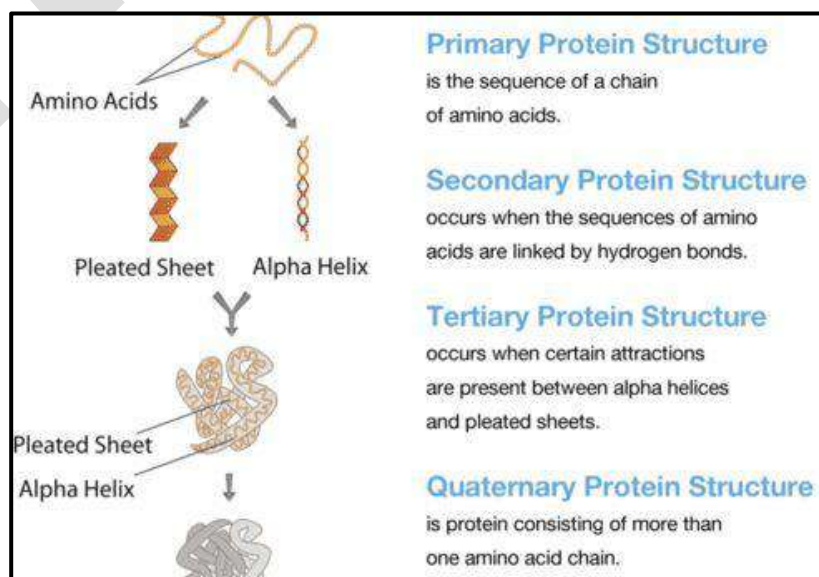
AAACAAGTGGGTCCTG

Lysine
Glutamine
Valine
Glycine



How does AlphaFold work?

- It uses processes based on **"training, learning, retraining and relearning."**
- The first step uses the available structures of 1,70,000 proteins in the **Protein Data Bank (PDB)** to train the computer model.
- Then, it uses the results of that training to learn the structural predictions of proteins not in the PDB. Once that is done, it uses the high-accuracy predictions from the first step to retrain and relearn to gain higher accuracy of the earlier predictions.
- By using this method, AlphaFold has now predicted the structures of the entire 214 million unique protein sequences deposited in the **Universal Protein Resource (UniProt) database**.



Significance of AlphaFold

- Proteins carry out all the functions inside a living cell.** Therefore, knowing **protein structure and function is essential to understanding human diseases**. Scientists predict protein structures using x-ray crystallography, nuclear magnetic resonance spectroscopy, or cryogenic electron microscopy. These techniques are not just time-consuming; they often take years and are based mainly on trial-and-error methods. The development of AlphaFold is a watershed movement in science and structural biology in particular.
- AlphaFold has **already helped hundreds of scientists accelerate their discoveries in vaccine and drug development** since the first public release of the database nearly a year back.

- The Indian community of structural biology needs to take advantage of the AlphaFold database and learn how to use the structures to design better vaccines and drugs.

STEVE PHENOMENON

GS-III SCIENCE & TECHNOLOGY

Context

- Recently, a sudden solar storm termed as STEVE phenomenon struck the Earth's magnetic field late on August 7 night.

STEVE Phenomenon

- Strong Thermal Emission Velocity Enhancement, or STEVE** for short, is a puzzling aurora-like phenomenon that appeared as a result of the storm's collision with our planet's outer shield.
- It is an atmospheric optical phenomenon that appears as a purple and green light ribbon in the sky.
- STEVE first appeared in the sky in 2017 and has been appearing often since. With green picket fences surrounding it occasionally, this purple streak of light stretches across the night sky.

How does it occur?

- The phenomenon is caused by a 25 km wide ribbon of hot plasma moving at a speed of 6 km/s (compared to 10 m/s outside the ribbon) at an altitude of 450 km, according to European Space Agency's Swarm mission.
- STEVE has been observed in New Zealand, Canada, Alaska and the United Kingdom during a specific time of the year - between October to February which lead NASA scientists to believe that its occurrence is related to seasons.
- In 2018 however, scientists discovered that the phenomenon's skyglow is produced in the ionosphere because it was not connected to particle precipitation (either electrons or ions).

Aurora

- An aurora also commonly known as the polar lights, is a natural light display in Earth's sky, predominantly seen in high-latitude regions (around the Arctic and Antarctic). Auroras are the result of disturbances in the magnetosphere caused by the solar wind.
- Major disturbances result from enhancements in the speed of the solar wind from coronal holes and coronal mass ejections. These disturbances alter the trajectories of charged particles in the magnetospheric plasma. These particles, mainly electrons and protons, precipitate into the upper atmosphere (thermosphere/exosphere). The resulting ionization and excitation of atmospheric constituents emit light of varying colour and complexity.
- When we see the glowing aurora, we are watching a billion individual collisions, lighting up the magnetic field lines of Earth.

How is STEVE Phenomenon different from Auroras?

- STEVE phenomenon is closer to the equator than the Auroras.
- It stands out sharply from the typical auroras, and it also appears significantly lower in the atmosphere.
- STEVE is different from the usual aurora, but it is made of light and it is driven by the auroral system.

WOMEN SCIENTISTS IN INDIA

GS-III SCIENCE & TECHNOLOGY

Context

- The appointment Dr N Kalaiselvi as the first woman director general of Council of Scientific and Industrial Research (CSIR), underlined a significant trend – official data show the participation of women in science research has been generally increasing over the past two decades in the country.

Women in Science: Trend

Department of Science and Technology Data

- More than a quarter – 28% – of participants in extramural R&D projects in 2018-19 were women, up from 13% in 2000-01.
- The number of women principal investigators in R&D had risen more than four times from 232 in 2000-01 to 941 in 2016-17.
- Percentage of women researchers went from 13.9% in 2015 to 18.7% in 2018.
- There were fewer women researchers in engineering and technology (14.5%) compared to agriculture (22.5% each), and health sciences (24.5%).
- The percentage of women researchers in the social sciences and humanities is, however, much higher at 36.4%.

WOMEN IN SCIENCE

SCIENTISTS

Post-doc and above,
including researchers
& faculty



*2020 data approximate, still being analysed
Source: DST

ENROLMENT

Year	Undergrad	PG	MPhil	PhD
2011-12	13.2%	9.62%	17.58%	22.9%
2012-13	13.2%	14.26%	28.39%	28.3%
2013-14	14.1%	13.84%	27.22%	27.8%
2014-15	15.4%	14.09%	27.9%	27.7%
2015-16	16.2%	14.49%	27.6%	27.5%

Source: Status of Women in Science (2016-17) by SSES for Niti Aayog

All India Survey on Higher Education (AISHE) 2019 Results

- A 53% and 55% participation of women in science education at the Bachelor's and Master's levels respectively, numbers that are comparable with many developed countries. But **at doctoral level, women graduates (44%) lagged behind men (56%)**.
- Participation (of women) is healthy till the postgraduate level. But there is a drop at the post-doctoral level, where most of the research takes place. Even though this too has increased, **it is still far less than the 30% global average**.

Department of Science and Technology Findings

- In the past two years, the majority of the programme committees in the DST have had at least 20-25% women. 11 out of 18 divisions in the DST are now headed by women – that is 61%, the largest percentage of women in leadership in any government department.
- The rate of women's participation is particularly low across the five IITs in Delhi, Mumbai, Kanpur, Chennai, and Roorkee – ranging from 9% to 14%. Women's participation is the highest in biotechnology (40%) and medicine (35%).
- ICAR has 29% women's participation, CDRI has 18%, NIPER Hyderabad 21%, and the Defence Bio-Engineering and Electro-Medical Lab (DEBEL) in Bangalore has 33%. Delhi University has 33% women's participation, while Tezpur University in Assam has 17%.

Factors in play

- The increase in women's participation in research is due to a combination of government programmes and natural progression.
- In numerous CSIR labs, women's participation has increased because there are creche facilities now in the residential colonies where the women scientists live. Parental attitudes towards girls pursuing science has also seen a shift, and girls are now encouraged more.

Steps taken by the Government

- Women scientist-specific schemes provide opportunities to women scientists and technologists especially those who had a break in careers.
 - **Women Scientists Scheme-A (WOS-A)** for conducting research in Basic and Applied Sciences.
 - **Women Scientists Scheme-B (WOS-B)** for research that entails Science and Technology interventions for societal benefit.
 - **Women Scientists Scheme-C (WOS-C)** for internship in Intellectual Property Rights (IPRs).
- **Consolidation of University Research through Innovation and Excellence in Women Universities (CURIE) Programme** provides support for the development of research infrastructure in women's universities.
- **'Vigyan Jyoti' programme** to encourage meritorious girl students of Class 9-12 to pursue education and a career in science and technology.
- **Gender Advancement for Transforming Institutions (GATI)** aims to gender-sensitive approaches and inclusiveness in institutions.
- **Biotechnology Career Advancement and Re-orientation Programme (BioCARE)** to enhance the participation of Women Scientists in Biotechnology research.
- **Indo-US Fellowship for Women in STEMM (Science, Technology, Engineering, Mathematics & Medicine)** encourages women scientists and technologists to undertake international collaborative research in premier institutions in the USA for 3-6 months.
- **"SERB-POWER (Promoting Opportunities for Women in Exploratory Research)"** has been launched to mitigate gender disparity in science and engineering research funding in Indian academic institutions and research and development (R&D) laboratories.
- **Women in Science and Engineering-KIRAN (WISE-KIRAN) programme** to ensure participation of women in the field of Science and Technology (S&T).
- Nearly 40 **Women Technology Parks (WTPs)** have been supported under Science & Technology Scheme for Women.
- The recently released draft of the **National Science, Technology and Innovation Policy, 2022 (STIP 2022)** has targeted to ensure 30% participation of women in science by 2030.

Key factors perpetuating gender gap in the field of Scientists

- **Gender Stereotypes: STEM fields are often viewed as masculine**, and teachers and parents often underestimate girls' math abilities starting as early as preschool.
- **Male-Dominated Cultures:** Because fewer women study and work in STEM, these **fields tend to perpetuate inflexible, exclusionary, male-dominated cultures** that are not supportive of or attractive to women and minorities.
- **Fewer Role Models: Girls have fewer role models to inspire** their interest in these fields, seeing limited examples of female scientists and engineers in books, media and popular culture. There are even fewer Black women role models in math and science.
- **Lack of Education or Illiteracy:** the problem is the **lack of awareness among women to use their rights**.

- **Social Customs, Beliefs and Practices:** The views of society, customs and cultural practices play a big role in keeping women at lower places in the society – refusing them opportunities, which are generally provided to men, who are considered the dominant ones in India.
- **Pressure for marriage:** A career in science begins soon after completing one's PhD, which coincides for most Indian women with marriage and family commitments. Breaks or temporary research positions of 3-5 years taken by women to balance their dual role often puts them at a disadvantage at later stage of their career.
- **Male dominated workspace:** Indian women in STEM are subjected to subtle biases in their workspaces, such as gender bias in performance evaluations and no opportunities to go to the top position. With fewer female peers and leaders, they are at a risk of exclusion and isolation in male-dominated workspaces.
- **Patriarchal cultural barriers of so-called morality:** Very few female scientists in India are able to get academy memberships, which are considered a stepping stone for establishing scientific achievements in India. For this, one needs to be nominated and then elected. Academic merit plays an important role but there are several unwritten rules such as knowing people in decision-making bodies which comes into play in the process. In this area, women scientists easily lose out, as personal interactions with male colleagues are deeply constrained by the patriarchal cultural barriers of so-called morality. A similar issue is faced by the Indian female scientists to find a place on the government-constituted advisory bodies such as the research advisory board, scientific advisory committee or research council for various national institutions or being a part of the committees that make decisions about accepting or rejecting projects for extramural funding.
- **Less Pay:** Women in STEM are able to publish less and are paid less for their research. They are not able to progress as far as men in their careers according to the UNESCO study.
- **Women are also unrecognized for their scientific achievements:** A 2009 report on the breakup of gender-wise breakup of data related to three important national awards - SSB, Young Scientist, and National Bio Science award - revealed a consistent marginalization of female scientists and technologists.
- **Gender Roles:** The gender roles associated with learning subjects like science and mathematics are so ingrained that 76 per cent of Indian women working in STEM believe that their male co-workers have a genetic advantage over them in mathematics and science. This, even as, research points to girls scoring similarly or slightly higher than boys in examinations and assessments in maths and science.
- **Other:** There are also some institutions which do not permit both the spouses to work in the same unit or institution, and this creates an impediment for women scientists seeking employment.

Way Ahead

- India aims to raise women's participation in S&T to 30% by 2030. The Government needs to create a facilitative gender-neutral culture of research in institutions and industries. More women scientists would support the development of products, processes, and technology and create a meaningful impact on society and national needs. Majorly, we have to work on the following areas -
 - Give women access to education just like men.
 - Stop the violence and sexual assault against women.
 - End child marriages.
 - Aware women about women's rights in India.
 - Improvement in information accessibility for young women interested in pursuing science.
 - Work towards breaking gender stereotypes through early investment in re-skilling and the promotion of STEM education.
 - Introduction to female role models and mentors can help change stereotypical perceptions related to these subjects inspire more girls to choose and work in the area.
 - STEM employers should take a top-down, multi-pronged approach in creating a supportive environment for women. (A 2016-17 NITI Aayog report, designed to understand the reasons for the loss of trained female scientists had found that to be able to work longer in STEM, women scientists need age relaxation in eligibility criteria, an extension of benefits like housing, transport, and medical help, as well as flexibility in their job contracts that allows them more work-life flexibility).
 - Career breaks need to be accommodated, as women scientists have dual commitments. Seniority based on the total number of years of work experience or service rather than continuous service may help to retain talent and experience by allowing for re-entry of women scientists, which would otherwise be lost permanently.
 - There is a need for incorporating a system of grading institutes depending on the enrolment of women and the advancement of the careers of women faculty and scientists. It envisions that at least 30 per cent of decision-making bodies in the field, including selection and evaluation committees, to comprise of women in the future.
 - Promotion of more women scientists to leadership positions in order to inspire young women to pursue careers in science – this could inspire more young women to pursue careers in science and get women scientists to get more recognition for their work.

- Flexible work timings, and adequate, gender-neutral parental leave.

Giving women equal opportunities will not just help narrow the gender pay gap in the field, but also enhance their economic security and well-being - helping employ the full potential of the country's skilled female labour force.

SPACE SITUATIONAL AWARENESS (SSA)

GS-III SCIENCE & TECHNOLOGY

Context

- India's first commercial space situational awareness observatory, to track objects as small as 10 cm in size orbiting the earth, will be set up in the Garhwal region of Uttarakhand by Digantara, a space sector start-up.

SSA

- Space Situational Awareness (SSA) **refers to the knowledge of the space environment, including location and function of space objects and space weather phenomena.** SSA covers three main areas: Space Surveillance and Tracking (SST) of man-made objects.

The SSA Observatory

- The space situational awareness (SSA) observatory **will help India track any activity in space including that of space debris and military satellites hovering over the region.**
- Currently, the United States is a dominant player in monitoring space debris with observatories in multiple locations and commercial companies providing additional inputs from across the world.
- The observatory in Uttarakhand will fill the crucial gap in SSA observations in the region as there is a lack of such facilities between Australia and southern Africa.

Significance

- The high-quality observations, along with those of its partner ground-based sensor network, **would help improve its ability to monitor events occurring in deep space,** especially in the geostationary, medium-Earth, and high-Earth orbits.
- With this data, it **would be able to reduce the potential for collisions between satellites and other spacecraft** by making more accurate predictions of their location, speed, and trajectory.
- The observatory **will also give India indigenous capabilities to monitor space activity over the subcontinent.** For example, Chinese satellites are seen over one particular region of India for a long time, having the indigenous capability to monitor such activities and not being dependent on countries like the U.S. is a plus for India.
- Digantara's network of observational facilities will work in tandem with the currently planned constellation of space-based sensors. This will improve the effectiveness of tracking and identifying pre-existing resident space objects (RSO), and **will result in the creation of a hybrid data pool that will serve both the commercial and the defence sectors of the space industry.**

HYDROGEN FUEL CELL VEHICLE

GS-III SCIENCE & TECHNOLOGY

Context

- Recently, India's first indigenously developed Hydrogen fuel cell bus developed by KPIT-CSIR in Pune was launched.

Hydrogen vehicles

- Hydrogen Fuel Cell Vehicles (FCVs) are similar to electric vehicles (EVs) in that they use an electric motor instead of an internal combustion engine to power the wheels. However, while **EVs run on batteries that must be plugged in to recharge,** **FCVs generate their electricity onboard.** Thus, Hydrogen vehicles are a type of electric car **that use fuel cells powered by hydrogen, to run the motor** instead of relying primarily on a lithium-ion battery pack. They don't burn fuel like gasoline cars.

Fuel Cell

- The fuel cells are similar in design to a lithium-ion battery: they have an anode, a cathode, and a catalyst that triggers the separation of electrons and protons from hydrogen gas pumped inside. Like the lithium-ion cells in an EV battery, hydrogen cars have multiple fuel cells working at once to generate electricity. That collection of cells is called the hydrogen fuel cell stack.

Working

- Hydrogen from the car's onboard fuel tanks combines with oxygen inside the fuel cell stack to generate electricity via a process called **reverse electrolysis.** The electrons are removed from the hydrogen gas, sent through the circuit to power the motor, and combine with oxygen on the other side of the circuit to form water vapor, which is vented via the car's exhaust.

- The electricity that is generated from the hydrogen fuel cells either powers the electric motor directly or charges a small lithium-ion battery that helps power the motor and can store the energy for later use.
- This battery also captures power from the vehicle's regenerative braking system for later use and stores excess power from the fuel cell stack during low-energy driving.

Regenerative braking systems (RBSs) are a type of kinetic energy recovery system that transfers the kinetic energy of an object in motion into potential or stored energy to slow the vehicle down, and as a result increases fuel efficiency. These systems are also called kinetic energy recovery systems.

Advantages of Hydrogen Fuel Cell Vehicles

- They produce no tailpipe emissions. They only emit water vapour and warmair.
- They are more efficient than internal combustion engine vehicles.
- Hydrogen can be refilled in a fuel cell vehicle in a matter of minutes. (It could take hours to charge a battery-powered electric bus.)
- It could increase energy resiliency through diversity and strengthening the economy.

Challenges

- FCEVs are more expensive to refuel, in part because hydrogen is so expensive to produce.
- FCEV refueling infrastructure is severely lacking at the moment. There are fewer than 400 FCEV fueling stations worldwide.
- While FCEVs may run emission-free themselves, the plants that create their hydrogen fuel often do so by burning fossil fuels in a process called steam reforming. If that continues, FCEVs can't really be called zero-emission vehicles.

Way Ahead

- Alternative processes need to be explored like water electrolysis, which uses a renewable source like solar to generate electricity that can be used to separate the hydrogen from water. We need to move towards renewable methods of generating hydrogen in the future.



WEAPONS OF MASS DESTRUCTION

GS-III SECURITY & DEFENSE

Context

- The Parliament of India has passed a bill to prohibit the financing of weapons of mass destruction.

Details

- The Foreign Minister has introduced a bill to prohibit the financing of weapons of mass destruction (WMD) and provides the government with the power to freeze and seize the assets of people involved in such activity.
- The Minister stated that the existing Act (Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act, 2005) does not cover the financial aspect of such delivery systems and the new provisions are necessary to meet international obligations.

The Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful activities) ACT, 2005

- An Act to prohibit unlawful activities, in relation to weapons of mass destruction and their delivery systems.
- No person shall unlawfully manufacture, acquire, possess, develop or transport a nuclear weapon or other nuclear explosive device and their means of delivery.
- No person shall unlawfully transfer, directly or indirectly, to anyone a nuclear weapon or other nuclear explosive devices, or transfer control over such a weapon, knowing it to be a nuclear weapon or other nuclear explosive devices.
- No person shall unlawfully manufacture, acquire, possess, develop or transport a biological or chemical weapon or their means of delivery.
- No person shall unlawfully transfer, directly or indirectly, anyone's biological or chemical weapons.
- No person shall unlawfully transfer, directly or indirectly, to anyone missiles specially designed for the delivery of weapons of mass destruction.
- The Act makes it a severe criminal offence to transfer weapons of mass destruction, missiles specially designed for their delivery, and WMD-usable materials, equipment and technologies; or to transfer fissile or radioactive material for use in terrorist acts.
- The Act also prohibits the transfer, acquisition, possession or transport of fissile or radioactive material for use in terrorist acts.

Key Features of the Bill

- The 2005 Act only prohibited the manufacturing of weapons of mass destruction and their delivery systems.
 - The proposed bill also prohibits the financing of such weapons.
- No person shall finance any activity which is prohibited under the Act or the United Nations (Security Council) Act, 1947 or any other relevant Act, in relation to weapons of mass destruction and their delivery systems.
- The government will have the powers to "freeze, seize or attach funds or other financial assets or economic resources owned or controlled, wholly or jointly, directly or indirectly, by such person.

Weapons of Mass Destruction

- A weapon of mass destruction is a broad term given to a class of weapons including nuclear, chemical and biological weapons.
- It can be defined as those weapons which are extremely dangerous and have the potential of killing a large population.

PEGASUS SOFTWARE

GS-III SECURITY & DEFENSE

Context

- A three-judge Bench led by Chief Justice of India N. V. Ramana on August 25 said the Pegasus technical committee has reported that out of 29 phones examined, five were found infected with "some malware" but that did not mean it was Pegasus spyware.

What is Pegasus?

- Pegasus is the name of a spyware developed by Israeli firm NSO.
 - A spyware is any **malicious software designed** to enter your computer device, gather your data, and forward it to a third-party without your consent.
- It can be introduced surreptitiously into mobile devices and can suck up all data and meta-data on the infected device as well as monitor conversations, chats and browsing.
- Pegasus, is perhaps the most powerful spyware ever created.
- It is designed to infiltrate smartphones — Android and iOS — and turn them into surveillance devices.

- The Israeli company, however, markets it as a tool to track criminals and terrorists – for targeted spying and not mass surveillance.

Who can buy Pegasus?

- NSO claims it will **only sell the software to verified government agencies**, with a contractual clause that the spyware can only be used in cases of suspected crime or terrorist activity.
- In practice, the clause is unenforceable -- any buyer can then use it as they please.
- However, it is possible for NSO to verify potential buyers and check whether they are official agencies, though it refuses to release its client list.
- NSO claims it has 60 clients in 40 countries.
- NSO also says the spyware is mainly used by law enforcement and intelligence agencies as well as the military.

What can Pegasus do?

- Once installed, the spyware takes a wide range of permissions, allowing it to monitor location, e-mails, grab contact lists, take screenshots, grab media, grab instant messages and SMS, access browser history, take control of the phone's mike and cameras, etcetera.
- Pegasus can also be deleted remotely. It is very hard to detect and once it is deleted, leaves few traces.
- It can also be used to plant messages/emails, etcetera, which is why there are theories it may have been used to plant fake evidence to implicate activists in the Bhima Koregaon case.

Who has been targeted?

- The NSO has stated that **Pegasus is not a tool for mass surveillance**.
- The stated **aim of Pegasus is to fight crime and terrorism**, the database also has the numbers of over 200 journalists worldwide, including 40 from Indian media houses.

Pros and cons of public surveillance

Pros

- **Increase Public Safety:** Just like surveillance on our private property improves our home security, public surveillance increases public safety.
- **Reduce Crime Rate:** It can keep an eye out for crimes as well as act as a deterrent.
- **Captures "precrime" data**
- **Helps Catch Criminals**
- It helps authorities to track criminals down.
- **Encourages good behavior**
- **Provide Evidence & Gather Clues**
- **Acts as reassurance**
- **Convenience**

Cons

- **Easily Abused:** Unfortunately, this technology can be easily abused. For example, information collected can potentially be used as a form of blackmail. Another example is voyeurism and stalking. To combat these issues, strict regulations on public surveillance must be put into place.
- **Reduces personal privacy**
- **Reduces personal freedom**
- **Freezes free speech**
- **Creates a "Big Brother" society**
- **Creates a "nanny state"**
- **Brings into disrepute the role of government**
- **Blurs moral and legal boundaries**
- **Undermines the rule of law**
- **Increases societal "paranoia"**
- **Narrows choices through creation of algorithmic "echo chambers"**
- **Increases supply side manipulation**
- **Information asymmetry (supply side high, demand side low)**
- **Doubts about Effectiveness**
- **Expensive:** High maintenance and costs of these systems is not justified by their limited results.

What do Indian laws outline?

- **Section 5(2) of The Indian Telegraph Act, 1885**, states that the government can intercept a “message or class of messages” when it is “in the interests of the sovereignty and integrity of India, the security of the State, friendly relations with foreign states or public order or for preventing incitement to the commission of an offence”.
- The **Rule 419A of the Indian Telegraph Rules, 1951** was added to the Telegraph Rules in 2007 after the verdict in the People’s Union for Civil Liberties (PUCL) vs Union of India case in 1996, in which the Supreme Court said **telephonic conversations are covered by the right to privacy, which can be breached only if there are established procedures**.
- Under Rule 419A, **surveillance needs the sanction of the Home Secretary at the Central or State level**, but in “unavoidable circumstance” can be **cleared by a Joint Secretary or officers above**, if they have the Home Secretary’s authorization.
- In the **Puttaswamy vs. Union of India** verdict of 2017, the Supreme Court further reiterated the need for oversight of surveillance, stating that it should be **legally valid and serve a legitimate aim of the government**.
- The court also said the **means adopted should be proportional to the need for surveillance**, and there should be **procedures to check any abuse of surveillance**.
- The second legislation enabling surveillance is **Section 69 of the Information Technology Act, 2000**, which deals with **electronic surveillance**.
- It facilitates government “interception or monitoring or decryption of any information through any computer resource” if it is in the interest of the “sovereignty or integrity of India, defence of India, security of the State, friendly relations with foreign States or public order” or for preventing or investigating any cognizable offence.

Are India’s laws on surveillance a threat to privacy?

- The procedure for electronic surveillance as authorized by Section 69 is detailed in the **Information Technology (Procedure and Safeguards for Interception, Monitoring and Decryption of Information) Rules, 2009**.
- These rules are **very broad and allow even the redirection of traffic to false websites or the planting of any device to acquire any information**.
- Use of Pegasus is **illegal as it constitutes unauthorized access under Section 66 of the Information Technology Act**.
 - **Section 66** prescribes punishment to anyone who gains unauthorized access to computers and “downloads, copies or extracts any data”, or “introduces or causes to be introduced any computer contaminant or computer virus,” as laid down in Section 43.

Way Forward

- There is an urgent need to enact the **Personal Data Protection law to protect citizen’s right to privacy**.
- There is a need to **address the existing loopholes in the legal framework that allow surveillance and affect privacy**. For example: the IT act.

OUR SUPER ACHIEVERS IN OPSC

 ASWINI K. PANDA RANK 1	 ANKUR ABHILASH RANK 2	 RASHMI REKHA PATRA RANK 3
 AMARENDRASWAIN RANK 12	 BISWA B. TRIPATHY RANK 13	 LOREN ROUTRAY RANK 16
 PRABHU P. PANDA RANK 17	 PRITI BALA RAN RANK 18	 BISWJIT SAHOO RANK 19
 PRIYANKA P. PATI RANK 20	 THEELINE SAHOO RANK 27	 P. SUBHRAJIT BISWAL RANK 28
 LITUSMITA MISHRA RANK 30	 MILAN JAISWAL RANK 36	 SUMAN S. KUNDU RANK 37
 SAMIKHIYA PANI RANK 40	 SIBA S. SAHOO RANK 41	 PRANINANDAN GIRI RANK 42
 SIDHARTH G. PARIDA RANK 43	 SAMARJIT TRIPATHY RANK 44	 MANISHITA MAHARANA RANK 45

OUR SUPER ACHIEVERS IN WBSCS

 SRIMAN BANERJEE RANK 20	 BISWAJIT GHOSH RANK 6
 AKASH GHOSH RANK 5	 SAFIKUL ALAM RANK 6
 SANJEEV SHAW RANK 17	

E-WASTE RULES**GS-III ENVIRONMENT & ECOLOGY****Context**

- A proposed framework by the Centre for regulating e-waste in India has upset a key link of India's electronic waste collection system and threatens the livelihood of thousands.

Details

- Electronic waste, or electronic goods that are past their shelf life, is **largely handled by India's vast informal sector.**
- Spent goods are dismantled and viable working parts refurbished, with the rest **making their way into chemical dismantling units. Many of these units are run out of unregulated sweatshops that employ child labour and hazardous extraction techniques.**
- This electronic detritus also **contributes to contaminating soil as well as plastic pollution.**
- To address all of this, the environment ministry brought the E waste (Management) Rules, 2016,** that introduced a system of **Extended Producer Responsibility (EPR)** compelling makers of electronic goods to ensure a proportion of the goods they sold every year was recycled.
- They are expected to maintain records annually demonstrating this. Most companies however didn't maintain an in-house unit in charge of recycling and this gave rise to network of government-registered companies, called Producer Responsibility Organisations (PRO) who acted as an intermediary between manufacturers of electronic goods and formal recycling units, that were technologically equipped to safely and efficiently recycle end-of-life electronic goods.**
- PROs typically bid for contracts from companies and arrange for specified quantities of goods to be recycled and provide companies certified proof of recycling that they then maintain as part of their records. Several PROs work on consumer awareness and enable a supply chain for recycled goods.
- As of March, the Central Pollution Control Board has registered 74 PROs, and 468 authorised dismantlers who have a collective recycling capacity of about 1.3 million tons.**
- The Environment Ministry estimated 7,70,000 tons of e-waste to have been generated in 2018-19 and around one million tons in 2019-20 of which only a fifth (about 22% in both years) has been confirmed to be "dismantled and recycled."
- Environment Ministry issued a draft notification that does away with PRO and dismantlers and vests all responsibility of recycling with authorised recyclers, only a handful of whom exist in India.**
- Recyclers will source a quantity of waste, recycle them and generate electronic certificates. Companies can buy these certificates equivalent to their annual committed target and thus do not have to be involved with engaging PROs and dismantlers.
- Several PROs have mailed their objections to the Environment Ministry arguing that dismantling a fledgling system was detrimental to the future of e-waste management in India.**
- Under the new rules, recyclers will likely establish their own supply chains and companies will no longer bear any responsibility for ensuring that their produce is recycled.

Background

- According to Global E-waste Monitor 2020, **Global e-waste will increase by 38 per cent in the decade between 2020 and 2030.**
- There was **53.6 million tonnes of electronic waste in 2019 which is an average of 7.3 kg per capita.** That is a nearly 21 per cent increase in just five years
- Asia generated the greatest volume of e-waste in 2019.**
- Most E-waste in 2019 consisted of small equipment, large equipment and temperature exchange equipment.
- Less than 18 per cent of the e-waste generated in 2019 was collected and recycled.**
- The number of countries that have adopted a national e-waste policy, legislation or regulation has increased from 61 to 78 and includes India.** It is far from the target set by the International Telecommunication Union to raise the percentage of countries with an e-waste legislation to 50 per cent.
- The Global E-waste Monitor 2020 is a **collaborative product of the Global E-waste Statistics Partnership, formed by the United Nations University, International Telecommunication Union, International Solid Waste Association, UN Environment Programme.**

E-Waste

- E-Waste is short for **Electronic-Waste** and the term used to describe old, end-of-life or discarded electronic appliances.
- It is **categorised into 21 types under two broad categories: Information technology and communication equipment and Consumer electrical and electronics.**
- E-waste includes their components, consumables, parts and spares.

- E-waste contains several toxic additives or hazardous substances such as mercury, brominated flame retardants (BFR), CFCs and HCFCs.
- The increasing levels of e-waste, low collection rates, and non-environmentally sound disposal and treatment of this waste stream pose significant risks to the environment and to human health.
- International E-Waste Day has been observed on 14th October since 2018.

India specific

- There are 312 authorised recyclers of e-waste in India, with the capacity for treating approximately 800 kilotonnes annually.
- About 90 per cent of the country's e-waste is recycled in the informal sector.
- India's first e-waste clinic for segregating, processing and disposal of waste from household and commercial units has been set-up in Bhopal, Madhya Pradesh.
- According to the Central Pollution Control Board (CPCB), India generated more than 10 lakh tonnes of e-waste in 2019-20, an increase from 7 lakh tonnes in 2017-18. Against this, the e-waste dismantling capacity has not been increased from 7.82 lakh tonnes since 2017-18.

Concerns

- **Toxicity:** E-waste consists of toxic elements such as Lead, Mercury, Cadmium, Chromium, Polybrominated biphenyls and Polybrominated diphenyl.
- **Effects on Humans:** Some of the major health effects include serious illnesses such as lung cancer, respiratory problems, bronchitis, brain damages, etc due to inhalation of toxic fumes, exposure to heavy metals and alike.
- **Effects on Environment:** E-waste is an environmental hazard causing groundwater pollution, acidification of soil and contamination of groundwater and air pollution due to the burning of plastic and other remnants.

Challenges Related to Management of E-Waste in India

- A key factor in used electronic devices not being given for recycling was because consumers themselves did not do so.
- In India, about 4.5 lakh child laborers in the age group of 10-14 are observed to be engaged in various E-waste activities and that too without adequate protection and safeguards in various yards and recycling workshops.
- There is absence of any public information on most State Pollution Control Boards (SPCBs)/PCC websites.
- No clear guidelines are there for the unorganized sector to handle E-waste.
- Also, no incentives are mentioned to lure people engaged to adopt a formal path for handling E-waste.
- 80% of E-waste in developed countries meant for recycling is sent to developing countries such as India, China, Ghana and Nigeria.
- Lack of coordination between various authorities responsible for E-waste management and disposal including the non-involvement of municipalities.
- End of life computers often contain sensitive personal information and bank account details which, if not deleted leave opportunity for fraud.

International Conventions and government initiatives

- Originally the **Basel Convention** did not mention e-waste but later it addressed the issues of e-waste in 2006 (COP8).
- **Nairobi Declaration** was adopted at COP9 of the Basel Convention. It aimed at creating innovative solutions for the environmentally sound management of electronic wastes.
- **Rotterdam Convention, 2004** seeks to promote exchange of information among Parties over a range of potentially hazardous that may be exported or imported.
- In India prior to 2011, e-waste was covered under the **Hazardous Waste Management (HWM) Rules**.
- In 2011, under the **Environmental Protection Act 1986**, the **E-waste (Management and Handling) Rules, 2011** were enacted
- In 2016, the **E-Waste (Management) Rules, 2016** were enacted which replaced the 2011 Rules. The Rules were amended in 2018
- CPCB has also issued guidelines **Environmentally Sound Management of E-waste (on Collection, Storage, Dismantling & Segregation, Recycling, and Treatment & Disposal of E-Waste)**
- **Awareness Program on Environmental Hazards of Electronic Waste** initiated by Ministry of Electronics and Information Technology
- **Creation of Management Structure for Hazardous Substances** seeks to raise awareness among people about the 2016 Rules and its implementation.
- **Swachh Digital Bharat** seeks to create awareness among the public about the hazards of e-waste recycling by the unorganised sector, and to educate them about alternate methods of disposing of their e-waste.

NGT's Directions

- **Further steps should be taken for scientific enforcement of E-Waste Management Rules, 2016 (EWMR)** in the light of the reports of the CPCB.
- It noted gaps in collection targets, as the amount of e-waste collected in 2018-19 was 78,000 tonnes against a target of 1.54 lakh tonnes. There are clear governance deficits on the subject.
- **The CPCB may consider steps for compliance of Rule 16 requiring reduction in the use of Hazardous substances in the manufacture of electrical and electronic equipment and their components or consumables or parts or spares.**
- It took note that a large number of accidents take place in residential areas on account of unscientific handling of e-waste.
- **This needs special attention for constant vigilance in such hotspots.** This also requires review and updation of siting norms for e-waste by the CPCB which may be done within three months.
- **All the state pollution control boards need to identify the hotspots by constant vigil and to coordinate with the District Administration** at local levels to prevent damage to the environment and public health and meaningful enforcement of rule of law.

E-Waste Management Rules, 2016

- The **Ministry of Environment, Forest and Climate Change notified the E-Waste Management Rules, 2016** in supersession of the E-waste (Management & Handling) Rules, 2011.
- **Over 21 products (Schedule-I) were included under the purview of the rule.** It included Compact Fluorescent Lamp (CFL) and other mercury containing lamps, as well as other such equipment.
- For the first time, the **rules brought the producers under Extended Producer Responsibility (EPR), along with targets.** Producers have been made responsible for the collection of E-waste and for its exchange.
- Various producers can have a **separate Producer Responsibility Organisation (PRO) and ensure collection of E-waste,** as well as its disposal in an environmentally sound manner.
- **Deposit Refund Scheme** has been introduced as an additional economic instrument.
- The **role of State Governments has been also introduced** to ensure safety, health and skill development of the workers involved in dismantling and recycling operations.
- A provision of penalty for violation of rules has also been introduced.
- **Urban Local Bodies (Municipal Committee/Council/Corporation) have been assigned the duty to collect and channelize the orphan products** to authorized dismantlers or recyclers.
- **Allocation of proper space to existing and upcoming industrial units for e-waste dismantling and recycling.**

Way Forward

- There is need for **better implementation methodologies and inclusion policies** that provide accommodation and validation for the informal sector to step up and help us meet our recycling targets in an environmentally sound manner.
- Also, successfully **raising collection rates** required every actor to be involved, including consumers.
- There is a need to **strengthen the domestic legal framework** to address the issue of unregulated imports of e-waste
- Steps should be taken to **formalize the informal sector** by integrating it with the formal sector.
- Government should **introduce vocational training programs** to rightly skill the current unorganized sector employees to ensure their smoother transition to working with organized sector
- Governments must **encourage research into the development of better environmentally-sustainable e-waste recycling techniques**
- There is urgent need for a **detailed assessment of the E-waste** including quantification, characteristics, existing disposal practices, environmental impacts.
- There is **need of an effective take-back program providing incentives to producers.**
- **Mass awareness programmes** should be initiated to encourage consumers to reuse/ recycle electronic products

INDIA'S UPDATED NDC

GS-III ENVIRONMENT & ECOLOGY

Context

- Cabinet approves India's Updated Nationally Determined Contribution to be communicated to the United Nations Framework Convention on Climate Change.

Details

- The updated NDC seeks to enhance India's contributions towards achievement of the strengthening of global response to the threat of climate change, as agreed under the Paris Agreement.

- India at the 26th session of the Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Glasgow, United Kingdom, **expressed to intensify its climate action by presenting to the world five nectar elements (Panchamrit) of India's climate action.**
- This update to India's existing NDC translates the 'Panchamrit' announced at COP 26 into enhanced climate targets.
- The update is also a step towards achieving India's long term goal of reaching net-zero by 2070.**
- Earlier, India submitted its Intended Nationally Determined Contribution (NDC) to UNFCCC on October 2, 2015. **The 2015 NDC comprised eight goals; three of these have quantitative targets upto 2030 namely, cumulative electric power installed capacity from non-fossil sources to reach 40%; reduce the emissions intensity of GDP by 33 to 35 percent compared to 2005 levels and creation of additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover.**

New targets

- As per the updated NDC, India now stands committed to reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level and achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.**
- The approval, also takes forward the Prime Minister's vision of sustainable lifestyles and climate justice to protect the poor and vulnerable from adverse impacts of climate change.
- The updated NDC reads "To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for 'LIFE' - 'Lifestyle for Environment' as a key to combating climate change".
- The decision on enhanced NDCs demonstrates India's commitment at the highest level for decoupling of economic growth from greenhouse gas emissions.
- India's updated NDC has been prepared after carefully considering our national circumstances and the principle of **common but differentiated responsibilities and respective capabilities** (CBDR-RC). India's updated NDC also reaffirms our commitment to work towards a low carbon emission pathway, while simultaneously endeavoring to achieve sustainable development goals.
- Recognizing that lifestyle has a big role in climate change, the Prime Minister of India, at COP 26, proposed a '**One-Word Movement**', to the global community. This one word is LIFE...L, I, F, E, i.e. Lifestyle For Environment.
- The vision of LIFE is to live a lifestyle that is in tune with our planet and does not harm it. **India's updated NDC also captures this citizen centric approach to combat climate change.**
- The updated NDC also represents the framework for India's transition to cleaner energy for the period 2021-2030.
- The updated framework, together with many other initiatives of the Government, including tax concessions and incentives such as Production Linked Incentive scheme for promotion of manufacturing and adoption of renewable energy, will provide an opportunity for enhancing India's manufacturing capabilities and enhancing exports.
- It will lead to an overall increase in green jobs such as in renewable energy, clean energy industries- in automotives, manufacturing of low emissions products like Electric Vehicles and super-efficient appliances, and innovative technologies such as green hydrogen, etc.
- India's updated NDC will be implemented over the period 2021-2030 through programs and schemes of relevant Ministries /departments and with due support from States and Union Territories.

INDIA'S SOLAR POWER DREAM

GS-III ENVIRONMENT & ECOLOGY

Context

- Solar photovoltaics (PV) has driven India's push towards the adoption of cleaner energy generation technologies. **From less than 10 MW in 2010, India has added significant PV capacity over the past decade, achieving over 50 GW by 2022.**

More on the news

- By 2030, India is targeting about 500 GW of renewable energy deployment, out of which ~280 GW is expected from solar PV.** This necessitates the deployment of nearly 30 GW of solar capacity every year until 2030.
- However, there are challenges that need to be overcome for the sustainability of the PV economy. Indian solar deployment or installation companies depend heavily on imports, as India currently does not have enough module and cell manufacturing capacity.

Key components

- A typical solar PV value chain consists of first fabricating polysilicon ingots which need to be transformed into thin Si wafers that are needed to manufacture the PV mini-modules.
- The mini-modules are then assembled into market-ready and field-deployable modules.

- **India's current solar module manufacturing capacity is limited to ~15 GW per year.**
- The demand-supply gap widens as we move up the value chain — for example, India only produces ~3.5 GW of cells currently.
- India has no manufacturing capacity for solar wafers and polysilicon ingots, and currently imports 100% of silicon wafers and around 80% of cells even at the current deployment levels.
- **Also, out of the 15 GW of module manufacturing capacity, only 3-4 GW of modules are technologically competitive and worthy of deployment in grid-based projects.** India remains dependent on import of solar modules for field deployment.

Current govt policy

- The government has identified this gap, and is rolling out various policy initiatives to push and motivate the industry to work towards self-reliance in solar manufacturing, both for cells and modules.
- Key initiatives include a 40% duty on the import of modules and 25% duty on the import of cells, and a PLI scheme to support manufacturing capex.
- Also, it is mandatory to procure modules only from an approved list of manufacturers (ALMM) for projects that are connected to state/ central government grids; so far, only India-based manufacturers have been approved.
- While this will certainly help to motivate industry, the major challenges are related to size and technology.

Size and technology

- Most of the Indian industry is currently tuned to handling M2 wafer size, which is roughly 156 x 156 mm², while the global industry is already moving towards M10 and M12 sizes, which are 182 x 182 mm² and 210 x 210 mm² respectively.
- The bigger size has an advantage in terms of silicon cost per wafer, as this effectively means lower loss of silicon during ingot to wafer processing.
- In terms of cell technology, most of the manufacturing still uses Al-BSF technology, which can typically give efficiencies of ~18-19% at the cell level and ~16-17% at the module level.
- By contrast, cell manufacturing worldwide has moved to PERC (22-23%), HJT(~24%), TOPCON (23-24%) and other newer technologies, yielding module efficiency of >21%.
- **Producing more solar power for the same module size means more solar power from the same land area.** Land, the most expensive part of solar projects, is scarce in India — and Indian industry has no choice but to move towards newer and superior technologies as part of expansion plans.

Raw materials supply

- **There is a huge gap on the raw material supply chain side as well.**
- Silicon wafer, the most expensive raw material, is not manufactured in India.
- India will have to work on technology tie-ups to make the right grade of silicon for solar cell manufacturing — and since >90% of the world's solar wafer manufacturing currently happens in China, it is not clear how and where India will get the technology.
- Other key raw materials such as metallic pastes of silver and aluminium to form the electrical contacts too, are almost 100% imported.
- **India is more of an assembly hub than a manufacturing one, and in the long term, it would be beneficial to move up the value chain by making components that could drive the price and quality of both cells and modules.**

Academics plus industry

- Establishing state-of-the-art manufacturing facilities for cells, modules, and raw material needs access to technology. It is unlikely that companies that have spent millions of dollars on in-house and external R&D would make it easy for India to access the latest technologies easily or at a lower cost.
- India has hardly invested in creating high-quality high-TRL technology centres such as IMEC Belgium or the Holst Centre in the Netherlands, which can help the industry to try and test the technologies in a cost-effective manner.
- India needs to create such industry-like centres to work on specific technology domains with clear roadmaps and deliverables for the short and long term, monitored by a right mix of specialists from industry and academia.

Conclusion

- Although India is making great progress in the deployment of solar PV modules for power generation, its path to become a manufacturing hub for the same requires more than just putting some tax barriers and commercial incentives in the form of PLI schemes, etc.
- It will warrant strong industry-academia collaboration in an innovative manner to start developing home-grown technologies which could, in the short-term, work with the industry to provide them with trained human resource, process learnings, root-cause analysis through right testing and, in the long term, develop India's own technologies.

- High-end technology development requires substantial investment in several clusters which operate in industry-like working and management conditions, appropriate emoluments, and clear deliverables.

DECLINING MANGROVES COVER

GS-III ENVIRONMENT & ECOLOGY

Context

- The United States National Aeronautics and Space Administration (NASA) recently highlighted the loss of mangrove cover on Katchal island, a part of India's Nicobar archipelago. The orange portion shows the area where mangrove cover was lost

More on the news

- After the magnitude-9.2 Aceh-Andaman earthquake in December 2004, the islands experienced up to 3 meters of land subsidence. This submerged many mangrove ecosystems, resulting in a loss of more than 90 percent of mangrove extent in some areas.
- The mangrove cover on Katchal will not come back. But in other places, mangroves have reappeared since they propagate themselves through propagules.
- A propagule is a vegetative structure that can become detached from a plant and give rise to a new plant. Examples include a bud, sucker, or spore.
- The study also noted that mangroves had the highest ratio of loss to gain among the three types of tidal wetlands it studied. The other two were tidal flats and marshes.
- Some 27 per cent of the losses and gains were directly caused by human activity. Humans can alter wetlands through development, water diversion projects, or by converting the land to agriculture or aquaculture. But they can also expand wetlands through restoration projects.
- Other causes of wetland change were sea level rise, shoreline erosion, storms, altered sediment flow and subsidence. These can be either indirectly caused by humans or the result of natural coastal processes.
- The study also found that outside of Asia, tidal wetlands in Africa had the highest ratio of loss to gain.

What is a mangrove?

- A mangrove is a small tree or shrub that grows along coastlines, taking root in salty sediments, often underwater.
- The word '**mangrove**' may refer to the habitat as a whole or to the trees and shrubs in the mangrove swamp.
- Mangroves are flowering trees, belonging to the families Rhizophoraceae, Acanthaceae, Lythraceae, Combretaceae, and Arecaceae.

Why mangroves matter?

- The upper trunk, including the branches and leaves, of a mangrove tree lives completely above the waterline, while the lower trunk and the large root system are partly covered by seawater.
- Many species have roots diverging from stems and branches and penetrating the soil some distance away from the main stem (like banyan trees).

What are some of the special features of mangroves?

- **Saline environment:** A speciality of mangroves is that they can survive under extreme hostile environment such as high salt and low oxygen conditions. Mangrove trees contain a complex salt filtration system and complex root system that filter out 90% of the salt when come into contact with saline and brackish water.
- **Low oxygen:** In a mangrove environment, the oxygen in soil is limited or nil. Hence the mangrove root system absorbs oxygen from the atmosphere. Mangroves have special roots for this purpose called **breathing roots or pneumatophores**. These roots have numerous pores through which oxygen enters the underground tissues.
- Mangroves, like desert plants, store fresh water in thick succulent leaves. A **waxy coating on the leaves** seals in water and minimises evaporation.
- **Viviparous** – their seeds germinate while still attached to the parent tree. Once germinated, the seedling grows into a propagule. The mature propagule then drops into the water and gets transported to a different spot, eventually taking root in a solid ground.

How do mangrove forests help protect against strong cyclones?

- Mangrove forests **act as natural barriers against storm surge, coastal flooding and sea level rise**. Their intricate root system **stabilises the coastline, reducing erosion from storm surges**. Together with the tree trunks, they work like **speed-breakers to slow down the tides**.
- They **protect shorelines from damaging winds and waves**.
- Mangroves also help prevent erosion by stabilising sediments with their tangled root systems.

What are the other benefits to the environment?

- Mangrove thickets **maintain water quality** by filtering pollutants and trapping sediments originating from land.
- They **provide habitat for a diverse array of terrestrial organisms**. Their branches provide homes for lizards, snakes and nesting birds. Many species of coastal and offshore fish and shellfish rely exclusively on mangroves as their breeding, spawning, and hatching grounds.
- Mangroves also have a big impact on climate. Mangroves are **powerhouses when it comes to carbon storage**. Mangroves can sequester (lock away) greater amount of carbon than other trees in the peat soil beneath. They store this carbon for thousands of years.
- Many people living in and around mangroves depend on them for their The trees are a source of wood for construction and fuel. The ecosystem provides local fishermen with a rich supply of fish, crabs and shellfish. The ecosystem also **supports tourism**.

Where are mangrove ecosystems found?

- Mangroves can be found in the **tropical and subtropical regions of the world**.
- **Asia has the largest coverage of the world's mangroves**, followed by Africa, North and Central America, Oceania and South America.

In India

- The deltas of the **Ganges, Mahanadi, Krishna, Godavari, and the Cauvery** rivers contain mangrove forests.
- The backwaters in Kerala have a high density of mangrove forest.
- The **Sundarbans in West Bengal is the largest mangrove region in the world and a UNESCO World Heritage Site**. It spans from the Hooghly River in West Bengal to the Baleswar River in Bangladesh.
- The **Bhitarkanika mangrove system in Odisha** is India's second largest mangrove forest. **Pichavaram in Tamil Nadu** has a vast expanse of water covered with mangrove forests. It is home to many aquatic bird species.

What are the threats to mangroves?

- At least **one third of all mangrove forests has been lost** during the last few decades.
- **Coastal development, including construction of shrimp farms, hotels, and other structures**, is the primary threat to mangroves.
- Mangrove forests are **cleared to make room for agricultural land and human settlements**.
- Mangrove trees are used for firewood, construction wood, charcoal production, and animal fodder. In some parts of the world, there has been overharvesting which is no longer sustainable.
- Overfishing, pollution, and rising sea levels are the other threats to mangrove forests and their ecosystem.

COASTAL ECOSYSTEM NORMS

GS-III ENVIRONMENT & ECOLOGY

Context

- **Comptroller and Auditor General (CAG) of India tabled a report in Parliament on whether steps taken by the Union Environment Ministry to conserve India's coastal ecosystems have been successful**. The CAG frequently undertakes 'performance audits' of government programmes and ministries. This latest report contains the observations from an audit of Conservation of Coastal Ecosystems from 2015-20.

What are the Centre's obligations on conserving the coastline?

- The government has issued notifications under the Environment Protection Act, 1986, to regulate activities along India's coasts particularly regarding construction.
- The Coastal Regulation Zone Notification (CRZ) 2019, implemented by the Ministry, classifies the coastal area into different zones to manage infrastructure activities and regulate them.
- **The three institutions responsible for the implementation of the CRZ are the National Coastal Zone Management Authority (NCZMA) at the Centre, the State/Union Territory Coastal Zone Management Authorities (SCZMAs/UTCZMAs) in every coastal State and Union Territory and the District Level Committees (DLCs) in every district that has a coastal stretch and where the CRZ notification is applicable**.
- These bodies examine if CRZ clearances granted by the government are as per procedure, if project developers once given the go-ahead are complying with conditions, and if the project development objectives under the Integrated Coastal Zone Management Programme (ICZMP) are successful.
- They also evaluate the measures taken up by the government towards achieving the targets under Sustainable Development Goals, a set of United Nations-prescribed targets for countries towards eradicating poverty and becoming sustainable societies.

Why did the CAG undertake this audit?

- The CAG has a constitutional mandate to investigate and report on publicly funded programmes.
- The CAG conducted “pre-audit studies” and found that there were large-scale CRZ violations in the coastal stretches.
- Incidences of illegal construction activities (reducing coastal space) and effluent discharges from local bodies, industries and aquaculture farms had been reported by the media and this prompted it to undertake a detailed investigation.
- The audit pointed out various categories of violations.
- For one, the Environment Ministry hadn’t notified NCZMA as a permanent body and it was being reconstituted every few years. In the absence of defined membership, it was functioning as an ad-hoc body.
- There were instances of the Expert Appraisal Committees — a committee of scientific experts and senior bureaucrats who evaluate the feasibility of an infrastructure project and its environmental consequences — not being present during project deliberations.
- There were also instances of the members of the EAC being fewer than half of the total strength during the deliberations.
- The SCZMA had not been reconstituted in Karnataka and there was delayed reconstitution in the States of Goa, Odisha and West Bengal. The DLCs of Tamil Nadu lacked participation from local traditional communities. In Andhra Pradesh, DLCs were not even established.
- There were instances of projects being approved despite inadequacies in the Environment Impact Assessment (EIA) reports. These included non-accredited consultants preparing the EIA, using outdated data, not evaluating environmental impacts of the project, not appraising the disasters which the project area was prone to and so forth.
- Tamil Nadu didn’t have a strategy in place to conserve the Gulf of Mannar Islands.
- In Goa, there was no system for monitoring coral reefs and no management plans to conserve turtle nesting sites.
- In Gujarat, instruments procured to study the physiochemical parameters of soil and water of the inertial area of the Gulf of Kutch weren’t used.
- Sea patrolling in Gahirmatha Sanctuary, in Kendrapara, Odisha did not happen.
- A research laboratory at Dangmal, Kendrapara District, Odisha constructed in 2016 has not been made functional till date.
- There was no website to disseminate the information related to the NCZMA, the CAG found, which is a clear violation of the mandated requirements of the Authority.

Background

- The Coastal Regulation Zone Notification (CRZ) 2019 classifies the coastal area into different zones to manage infrastructure activities and regulate them. These are:
 - **CRZ-I:**
 - ✓ CRZ-I constitutes ecologically-sensitive areas, such as mangroves, corals/coral reefs, sand dunes, national parks, marine parks, sanctuaries, reserve forests, wildlife habitats, etc.
 - ✓ The coastal regulation zone areas in CRZ-I are situated between high tide lines and low tide lines.
 - ✓ High tide line - the line of intersection of the land with the water's surface at the maximum height reached by a rising tide.
 - ✓ Low tide line - the line on the land where the lowest tide of water touches during spring tide.
 - **CRZ-II:**
 - ✓ It constitutes the developed areas up to the shoreline, which fall within the existing municipal limits.
 - ✓ The development of unauthorised structures is not allowed in this zone.
 - **CRZ-III:**
 - ✓ Localities, such as rural areas that are relatively undisturbed and do not fall under the above categories, are included in this zone.
 - ✓ Only specific activities related to agriculture or certain public facilities are permitted under this coastal regulation zone.
 - **CRZ-IV:**
 - ✓ The zone constitutes water areas from the low tide line up to territorial limits, including areas of the tidal-influenced water bodies.
 - ✓ Activities such as fishing and other allied services are permitted in this zone.

RAMSAR WETLAND SITES

GS-III ENVIRONMENT & ECOLOGY

Context

- India adds 11 more wetlands to the list of Ramsar sites to make total 75 Ramsar sites covering an area of 13,26,677 ha in the country in the 75th year of Independence.

Details

- The 11 new sites include: Four (4) sites in Tamil Nadu, Three (3) in Odisha, Two (2) in Jammu & Kashmir and One (1) each in Madhya Pradesh and Maharashtra. Designation of these sites would help in conservation and management of wetlands and wise use of their resources.
- India is one of the Contracting Parties to Ramsar Convention, signed in Ramsar, Iran, in 1971. India signed it on 1st Feb 1982.
- During 1982 to 2013, a total of 26 sites were added to the list of Ramsar sites, however, during 2014 to 2022, the country has added 49 new wetlands to the list of Ramsar sites.
- During this year itself (2022) a total of 28 sites have been declared as Ramsar sites.
- Based on the date of designation mentioned on Ramsar Certificate, the number is 19 for this year (2022) and 14 for previous year (2021).
- Tamil Nadu has maximum no. of Ramsar sites (14 nos), followed by UP which has 10 nos. of Ramsar sites.

Brief of 11 wetlands designated as Ramsar sites

S.No	Name of wetland	Area in Ha	State
1.	Tampara Lake	300	Odisha
2.	Hirakud Reservoir	65400	
3.	Ansupa Lake	231	
4.	Yashwant Sagar	822.90	Madhya Pradesh
5.	Chitrangudi Bird Sanctuary	260.47	Tamil Nadu
6.	Suchindram Theroor Wetland Complex	94.23	
7.	Vaduvur Bird Sanctuary	112.64	
8.	Kanjirankulam Bird Sanctuary	96.89	
9.	Thane Creek	6521.08	Maharashtra
10.	Hygam Wetland Conservation Reserve	801.82	Jammu and Kashmir
11.	Shallbugh Wetland Conservation Reserve	1675	
	Total area of 11 sites	76316	

Background

- India's Ramsar wetlands are spread over 11,000 sq.km – around 10% of the total wetland area in the country – across 18 States.
- No other South Asian country has as many sites, though this has much to do with India's geographical breadth and tropical diversity.
- The U.K. (175) and Mexico (142) – smaller countries than India – have the most Ramsar sites, whereas Bolivia spans the largest area with 1,48,000 sq.km under the Convention protection.
- Being designated a Ramsar site does not necessarily invite extra international funds, but the States – and the Centre – must ensure that these tracts of land are conserved and spared from encroachment.
- Acquiring this label also helps with a locale's tourism potential and its international visibility.
- Wetlands, according to the Environment Ministry, are an "area of marsh, fen, peatland or water; whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres, but does not include river channels, paddy fields, human-made water bodies/tanks specifically constructed for drinking water purposes and structures specifically constructed for aquaculture, salt production, recreation and irrigation purposes."
- To be Ramsar site, however, it must meet at least one of nine criteria as defined by the Ramsar Convention of 1961, such as supporting vulnerable, endangered, or critically endangered species or threatened ecological communities or, if it regularly supports 20,000 or more waterbirds or, is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks are dependent upon.
- The National Wetland Inventory and Assessment compiled by the ISRO estimates India's wetlands to span around 1,52,600 square kilometres.

About

- Any wetland site which has been listed under the Ramsar Convention that aims to conserve it and promote sustainable use of its natural resources** is called a Ramsar Site.
- Ramsar Convention is known as the Convention of Wetlands. It was established in 1971 by UNESCO and came into force in 1975.
- Chilika Lake (Orissa) and Keoladeo National Park (Rajasthan) were recognized as the first Ramsar Sites of India**
- Uttar Pradesh has the most number of Ramsar Sites in India.**

- Renuka Wetland in Himachal Pradesh is the smallest wetland of India.

Number of sites by states

State/UT	No.	Names of sites
Andhra Pradesh	1	<u>Kolleru Lake</u>
Assam	1	<u>Deepor Beel</u>
Bihar	1	<u>Kanwar Lake</u>
Goa	1	<u>Nanda Lake</u>
Gujarat	4	<u>Khijadiya, Nalsarovar, Thol Lake, Wadhvana Wetland</u>
Haryana	2	<u>Sultanpur National Park, Bhindawas Wildlife Sanctuary</u>
Himachal Pradesh	3	<u>Chandra Taal, Pong Dam Lake, Renuka Lake</u>
Jammu and Kashmir	5	<u>Hokersar Wetland, Hygam Wetland Conservation Reserve, Shallbugh Wetland Conservation Reserve, Surinsar-Mansar Lakes, Wular Lake,</u>
Karnataka	1	<u>Ranganathittu Bird Sanctuary</u>
Kerala	3	<u>Ashtamudi Wetland, Sasthamkotta Lake, Vembanad-Kol Wetland</u>
Ladakh	2	<u>Tso Kar, Tsomoriri Lake</u>
Madhya Pradesh	4	<u>Bhoj Wetland, Sakhya Sagar, Sirpur Lake, Yashwant Sagar</u>
Maharashtra	3	<u>Lonar Lake, Nandur Madhameshwar, Thane Creek</u>
Manipur	1	<u>Loktak Lake</u>
Mizoram	1	<u>Pala Wetland</u>
Odisha	6	<u>Ansupa Lake, Bhitarkanika Mangroves, Chilika Lake, Hirakud Reservoir, Satkosia Gorge, Tampara Lake</u>
Punjab	6	<u>Beas Conservation Reserve, Harike Wetland, Kanjli Wetland, Keshopur-Miani Community Reserve, Nangal Wildlife Sanctuary, Ropar Wetland</u>
Rajasthan	2	<u>Keoladeo National Park, Sambhar Lake,</u>
Tamil Nadu	14	<u>Chitrangudi Bird Sanctuary, Gulf of Mannar Marine Biosphere Reserve, Kanjirankulam Bird Sanctuary, Karikili Bird Sanctuary, Koonthankulam Bird Sanctuary, Pallikarnai Marsh Reserve Forest, Pichavaram Mangrove, Point Calimere Wildlife and Bird Sanctuary, Suchindram Theroor Wetland Complex, Udhayamarthandapuram Bird Sanctuary, Vadavur Bird Sanctuary, Vedanthangal Bird Sanctuary, Vellode Bird Sanctuary, Vembannur Wetland Complex</u>
Tripura	1	<u>Rudrasagar Lake</u>
Uttar Pradesh	10	<u>Bakhira Sanctuary, Haiderpur Wetland, Nawabganj Bird Sanctuary, Parvati Arga Bird Sanctuary, Saman Bird Sanctuary, Samaspur Bird Sanctuary, Sandi Bird Sanctuary, Sarsai Nawar Jheel, Sur Sarovar, Upper Ganga River</u>
Uttarakhand	1	<u>Asan Barrage</u>
West Bengal	2	<u>East Kolkata Wetlands, Sundarban Wetland</u>

TILAPIA AQUACULTURE PROJECT

GS-III ENVIRONMENT & ECOLOGY

Context

- Realizing the potential of Fisheries sector, Technology Development Board, a statutory body under Department of Science and Technology, Govt. of India supports M/s Fountainhead Agro Farms Private Limited, Navi Mumbai, Maharashtra for 'Advanced, Intensive, All Male Tilapia Aquaculture Project with Israeli Technology'. The board has penned an mutual agreement, to provide loan assistance of Rs. 8.42 crores out of the total project cost of Rs. 29.78 crores to the company.

More on the news

- 'Tilapia' has emerged to be one of the most productive and internationally traded food fish in the world.
- The culture of tilapia has become commercially popular in many parts of the world and the fishery experts have dubbed the tilapia as "aquatic chicken" due to its quick growth and low maintenance cultivation. Today, if any fish that could be named as global fish, no better name can be thought of than Tilapia.
- In order to facilitate the culture of Tilapia in India in responsible manner, M/s Fountainhead Agro Farms Private Limited envisages setting up of a complete production line (from breeding to full fish) in Mudhol (Karnataka).
- The company aims to produce 500 tons of Tilapia, to be grown from the imported parent broodstock 'Hermon' from Nir David Fish Breeding Farm, Israel.

- **Hermion is a hybrid of two selected strains of Tilapia, namely Oreochromis Niloticus (Male) and Oreochromis Aureus (Female), and is known for special characteristics such as high growth rate; resistance to low temperature; light (attractive) colour; all hybrid fry progeny of males only, without the conventional system of usage of hormones.**
- The company has adopted advanced Israeli Technology from Aquaculture Production Technology Limited (APTIL), Israel (under Technology Service Agreement signed in October, 2020) for land locked locations through closed loop farming for arid zone with seasonal water supply from rivers, which may be replicated throughout India in multiple arid landlocked locations with reasonable water sources. In order to suit Indian conditions, the complete engineering of the facility is tuned as per the requirement of site conditions such as land availability, water availability, weather conditions, availability of the surrounding resources, soil conditions, topography.

Background

- The Government of India has placed special attention to fisheries sector with a view to uplift fishermen community of India economically through 'Blue Revolution'.
- The sector holds vast potential for export, especially the 'Tilapia Fish' considering its huge demand in the global market.
- Also, the imported technology being 'one of its kind' will be a great addition to Pradhan Mantri Matsya Sampada Yojana (PMMSY), the ambitious scheme of Hon'ble PM, which aims to double the export earnings to Rs.1,00,000 crore from fisheries sector.
- Fisheries is one of the fastest growing sectors amongst the primary producing sectors. The sector plays a vital role in economic and overall development of the country, also referred as the "sunrise sector", it is poised to bring in immense potential through equitable and inclusive growth.
- The sector is recognized as a powerful engine for providing employment to 14.5 million people and sustaining livelihood for 28 million fishermen community of the country.
- Thus, the sector urges young entrepreneurs of the country to come forward and offer solutions, resolving on-ground challenges through technology interventions and innovative solutions.
- To promote this, the cabinet under the chairmanship of Hon'ble Prime Minister, came up with 'Pradhan Mantri Matsya Sampada Yojana (PMMSY)' to bring about 'Blue Revolution' through sustainable and responsible development of fisheries sector in India.
- The scheme targets to enhance fish production to 220 lakh metric tons by 2024-25, at an average annual growth rate of about 9%. The ambitious scheme also aims to double the export earnings to Rs.1,00,000 crore and generate about 55 lakhs direct and indirect employment opportunities in fisheries sector over a period of next five years.

TASMANIAN TIGER

GS-III ENVIRONMENT & ECOLOGY

Context

- Scientists in the **US and Australia have embarked on a \$15-million project to resurrect the thylacine or Tasmanian Tiger, a marsupial that went extinct in the 1930s, using gene-editing technology.**

About

- Tasmanian Tiger (*Thylacinus cynocephalus*), **the only animal in the Thylacinidae family to survive in modern times, was a marsupial mammal that raises young ones in a pouch.**
- Even though the species earned its nickname Tasmanian Tiger because of the stripes along its back, it was a slow-paced carnivorous that usually hunted alone or in pairs at night.
- The sharply clawed animal had a dog-like head and ate kangaroos, other marsupials, small rodents, and birds.
- **Once widespread in the grass and woodlands of continental Australia extending north to New Guinea and south to Tasmania, the animal's fate changed after the European Colonisation of Australia.**
- The animals were reported to have eaten poultry of farmers, and were killed following official authorisation.
- Apart from this, competition with another animal, the Dingo, is also considered a reason for its extinction.
- The animal was at the top of the food chain, and hence played a significant role in balancing the ecosystem of its habitat by removing the weak animals and maintaining species diversity.
- **Also known as the apex predator for the same reason, its disappearance from the food chain resulted in Trophic Downgrading** — causal degradation of an ecosystem that occurs when higher trophic level animals are removed from the food chain, resulting in loss or exponential growth of other species.
- Trophic Downgrading also results in disruption of biogeochemical cycles, wildfires, growth of invasive species, and carbon sequestration, among other effects.
- As the thylacine was the only apex predator in its ecosystem, its absence impacted the Tasmanian Devil, which was almost wiped out by a facial tumour disease. The thylacine would have prevented this by removing sick and weak animals from the ecosystem, which would have eventually controlled the spread of the transmissible diseases.

The resurrection process

- Even though the last living thylacine died over 86 years ago, many embryos and young specimens of the species have been preserved.
- For the de-extinction project, the scientists will be using a genome sequenced from a DNA extracted from a 108-year-old specimen held at Australia's Victoria Museum.
- This genome will be compared with the closest living animal of the species- the fat tailed dunnart – to identify all the differences. Once all the differences are identified, scientists will engineer the living cell's DNA where it is different, essentially engineering the extinct species back.
- The fat-tailed dunnart is a mouse-like species in the Dasyuridae family in Australia. With an average body length of 2.4–3.5 inches, they are one of the smallest carnivorous marsupials.
- De-extinction will not be complete until the success of the rewilding process – reintroducing the animal to its native habitat – which will 'stabilise the fragile ecosystem of Tasmania.'

DROUGHT AS A PLANETARY DISASTER

GS-III ENVIRONMENT & ECOLOGY

Context

- Two-thirds of Europe is under some sort of drought warning, in what is likely the worst such event in 500 years.

Drought

- A drought is defined as "a period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrologic imbalance in the affected area." A drought can last for months or years.
- It can have a substantial impact on the ecosystem and agriculture of the affected region[5] and cause harm to the local economy.

Various Causes of Droughts

Lack or insufficient rainfall (or precipitation)

- This is the major cause of droughts in most regions. A long-drawn-out period without rainfall can cause an area to dry out. The quantity of water vapor in the atmosphere pretty much impacts the precipitation of an area. When a region has moist and low-pressure systems, there is huge probability that rain, hail, and snow will occur. The exact opposite would happen when the region has high-pressure systems, and less water vapor. Farmers plant crops in anticipation of rains, and so when the rains fail, and irrigation systems are not in place, agricultural drought happens.






Changes in climate

- Changes in climate, for instance, global warming can contribute to droughts. Global warming is likely to impact the whole world, especially third world economies. Most governments have tried to play down the fact that the earth's temperature has significantly increased. But scientists have proven, without doubt, that human activities are the main contributors to the increase in greenhouse gasses to the atmosphere. This increase in greenhouse gasses has resulted in warmer temperatures. Warmer temperatures are recipes for dryness and bushfires. These set of conditions mightily contribute to prolonged droughts.

Human activities

- Forests are critical components of the water cycle. They help store water, minimize evaporation, and contribute a great deal of atmospheric moisture in the form of transpiration. This, in essence, implies that deforestation, aimed at uplifting the economic status of a region, will expose vast quantities of water to evaporation. Cutting down trees will also take away the capability of the ground to retain water and allow desertification to occur easily. Deforestation also greatly minimizes watershed potential. Over-farming is another human activity contributing to droughts. Over-farming loosens the soil allowing erosion to take place. Soil erosion compromises the capacity of soil to hold water.

FIVE TYPES OF DROUGHT

1	METEOROLOGICAL drought refers to an extended period of dry weather patterns.	
2	HYDROLOGICAL drought refers to low water supply in our rivers, lakes, aquifers, and other reservoirs that often follows meteorological drought.	
3	AGRICULTURAL drought occurs when a water shortage significantly damages or destroys agricultural crops.	
4	ECOLOGICAL drought is the most recently defined type of drought and refers to widespread ecological damage caused by the lack of soil moisture.	
5	SOCIOECONOMIC drought refers to when a water shortage affects the supply and demand of drought commodities, such as water, food grains, and fish.	

Overexploitation of surface water resources

- Specific areas are endowed with surface water resources like rivers and streams whose sources are watersheds and mountains. These surface water resources could dry out if their main sources are interfered with. Irrigation systems and hydroelectric dams are just some of the aspects that contribute to over-exploitation of surface water resources. They also cut off supply of water to downstream communities.

Harmful Effects of Droughts

Economic Effects

- Economic effects of droughts usually involve loss of money by governments, enterprises, families or individuals. Below is an outline of the main economic impacts of droughts:
- Farmers will have to contend with spending huge sums of money for irrigation and watering animals. This involves drilling wells or buying water from far distances.
- Low yields equal loss of substantial income. Low yields also lead to pay cuts and layoffs to farm workers.
- Businesses and industries that produce farm equipment may close down since farmers have no money to purchase equipment.
- Prolonged shortage of rains means drier conditions. This makes an area susceptible to wildfires. Wildfires can destroy property; devastate farms and burn down forests. Governments spend millions to control or put out wildfires annually. All this affects the economy of the region.
- If water supply plummets, hydropower plants operate below capacity, and this means businesses have to pay more for electricity or incur the cost of using their own generators. Energy firms also lose out since they are unable to satisfy energy demands of the region. The government also loses a big chunk of tax revenue.

Environmental Effects

- Droughts lead to decimation of habitats. Water bodies such as rivers, lakes, ponds, lagoons, and creeks dry out, and this leads to death of water animals.
- Soil moisture is critical to the breakdown of organic matter. Droughts compromise soil quality since there is less to zero organic activity because organisms have died.
- Droughts magnify the impacts of desertification by wiping out any chance of land recovering.
- The quality and health of surface water bodies such as rivers, streams, lakes, and ponds are enormously impacted. This endangers living organisms depending on the water for survival.
- Wildlife walk long distances in search of water. They end up in new dangerous habitats that can lead to their demise.

Social Effects

- The social effects of drought are the most potent since they directly impact humans. Many in the third world countries that have experienced drought can attest to their severity.
- Water maintains our health. Sanitation and clean drinking water are critical to a healthy body. Droughts lead to malnutrition, anemia, and hunger.
- Droughts trigger migrations. This means the area will lack young and working population, a critical ingredient to the development of any region.
- Lack of control over when the drought ends can have far-reaching psychological effects like stress, anxiety, and depression. Social interaction reduces and community networks get broken.

Drought as Global Issue

- The number and duration of droughts around the world have increased by an alarming 29% since 2000.
- The upward trajectory in the duration of droughts and the severity of impacts, **not only affects human societies but also the ecological systems upon which the survival of all life depends**, including that of our species.
- According to **World Bank estimates**, drought conditions **can force up to 216 million people to migrate by 2050**. Other factors at play along with drought could be **water scarcity, declining crop productivity, rise in sea levels, and overpopulation**.
- As per the **World Meteorological Organisation**, weather, climate and water hazards have accounted for **50% of all disasters and 45% of all reported deaths** since 1970.
 - Between 2020 and 2022, 23 countries have faced **drought emergencies**.
 - Climate change alone will cause 129 countries to experience an **increase in drought exposure** in the next few decades.
- The **World Health Organisation (WHO)** also noted that approximately **55 million people are directly affected by droughts annually**, making it the most serious hazard to livestock and crops in almost every part of the world.
- According to a 2017 report by the **Food and Agriculture Organisation**, the percentage of plants affected by drought has more than doubled in the last 40 years.
- **Droughts and climate change are intensifying the incidence of wildfires that devastated roughly 30 million acres of land in the global north and south from 2018-2020 alone**, causing significant losses in livelihoods, health and biodiversity.
- **By 2025, two-thirds of the world could be living under water-stressed conditions**, with 1.8 billion people experiencing absolute water scarcity.

- Since 2000, there has been a sharp increase in the number of drought-hit districts in India.

Steps being taken

- **THE DELHI DECLARATION OF 2019:** Signed by 14th CoP of the UNCCD, called for better access and stewardship over land, and emphasised gender-sensitive transformative projects.
- **THE BONN CHALLENGE:** To bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.
- **GREAT GREEN WALL:** Initiative by Global Environment Facility (GEF), where eleven countries in Sahel-Saharan Africa have focused efforts to fight against land degradation and revive native plant life to the landscape.
- **PEACE FOREST INITIATIVE:** It is an initiative of South Korea to use ecological restoration as a peacebuilding process and aims at addressing the issue of land degradation in conflict-torn border areas.
- **INTERNATIONAL COALITION FOR ACTION ON SAND AND DUST STORMS (SDS):** SDS source base map will be developed with the goal of improving monitoring and response to these storms.

Steps being taken by India

- Integrated Watershed Management Programme
- National Afforestation Programme
- National Mission for Green India
- NREGA
- Soil Conservation in the Catchment of River Valley Project
- National Watershed Development Project for Rainfed Areas
- Fodder and Feed Development Scheme
- Command Area Development and Water Management programme
- Soil Health Card Scheme

Drought: reducing impacts and building resilience

- The adoption of national drought policies that are focused on risk reduction and which are complemented by drought mitigation plans at various levels of government will have significant ripple effects across key sectors.
- The adoption of these policies supports the implementation of **Sustainable Development Goal target 6 – “ensure availability and sustainable management of water and sanitation for all”** – by promoting integrated water resources management. The vulnerability to future drought episodes can be significantly reduced and the coping capacity of communities, even entire nations, can be improved.

A proactive approach for enhancing drought resilience is composed of three important pillars

1. Drought monitoring and early warning systems
2. Vulnerability and risk assessment
3. Drought risk mitigation measures

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MOCK 04	GS-III	20 AUGUST 2022	9 AM to 12 PM
MOCK 05	GS-IV	20 AUGUST 2022	2 PM to 5 PM

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ANANG TAL LAKE

PLACES IN NEWS

Context

- The Anang Tal lake, has been declared a monument of national importance through a gazette notification by the Ministry of Culture.

About the Lake

- Anang Tal Lake is situated in South Delhi. It was created in 1060 AD by Raja Anang Pal Tomar, the founder of Delhi.

"Ancient Monument"

An Archaeological Sites and Remains Act, 1958 defines an "Ancient Monument" as follows:

- Ancient Monument means any structure, erection or monument, or any tumulus or place of interment, or any cave, rock-sculpture, inscription or monolith which is of historical, archaeological or artistic interest and which has been in existence for not less than 100 years

"Monument of National Importance"

A "Monument of National Importance" is designated by the Archaeological Survey of India and includes the following:

- The remains of an ancient monument
- The site of an ancient monument
- The land on which there are fences or protective covering structures for preserving the monument
- Land by means of which people can freely access the monument

Note: Uttar Pradesh, has the highest number of historical monuments, as per the data released by the Ministry of Culture.

Anangpal II

- Anangpal II, popularly known as AnangpalTomar, was a ruler from the Tomar Rajput dyansty. He is known to have established and populated Delhi in the 11th century.
- The Tomar Empire during the reign of Anangpal II extended over various parts of Delhi, Haryana, Punjab, Himachal Pradesh, Uttar Pradesh, Madhya Pradesh and Rajasthan.
- The capital of Tomars changed a few times during the course of 457 years they ruled in the northern India. The first capital of the Tomar empire was Anangpur while the last one was Dhillikapuri (Delhi, Lal Kot).

HUNGA TONGA VOLCANO

PLACES IN NEWS

Context

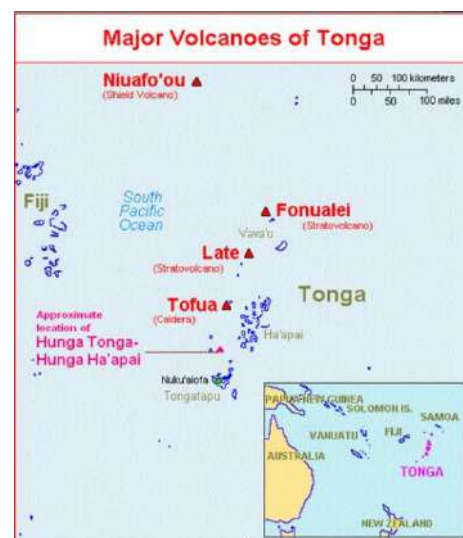
- The initial tsunami wave created by Tonga's underwater Hunga Tonga volcano eruption in January 2022 was 90 metres high, according to a new research.

About Hunga Tonga Volcano

- Hunga Tonga-HungaHa'apai is a submarine volcano in the South Pacific located north of Tongatapu, Tonga's main island.
- It is part of the highly active Kermadec-Tonga subduction zone and its associated volcanic arc, which extends from New Zealand north-northeast to Fiji.
- It is formed at the convergent boundary by the subduction of the Pacific Plate under the Indo-Australian Plate It lies about 100 km above a very active seismic zone.

About Tonga

- Location:** Located in Oceania, Tonga is an archipelago in the South Pacific Ocean, directly south of Samoa and about two-thirds of the way from Hawai'i to New Zealand.
- Capital:** The capital city of Nuku'alofa is located on the largest island.
- Islands:** Its 169 islands, 36 of them inhabited, are divided into three main groups – Vava'u, Ha'apai, and Tongatapu.
- Geology:** Geologically the Tongan islands are of two types: most have a limestone base formed from uplifted coral formations; others consist of limestone overlaying a volcanic base.
- Climate:** Tonga has a tropical rainforest climate (Af).



SHORT NEWS ARTICLES

GS-I CULTURE & HISTORY

Ramon Magsaysay

Context

- In response to a report that the CPI (M) had vetoed her selection as a finalist for the international Ramon Magsaysay Award for 2022, former Kerala health minister K K Shailaja said that she had consented to her party's decision. Shailaja said that in view of the anti-communist stance of Ramon Magsaysay, the former Philippines president whose legacy the prestigious award honours, and for its foundation's decision to consider her as an individual recipient for what was a state initiative, she had declined her nomination.

Details

- Launched in 1958, the Ramon Magsaysay Award, widely considered to be Asia's equivalent to the Nobel Prize, recognises outstanding leadership and communitarian contributions in Asia.
- Shailaja was considered for the award for her performance as state health minister from 2016 to 2021, a period which saw Kerala fight against the Nipah virus and Covid-19.

Who was Ramon Magsaysay?

- Ramon del Fierro Magsaysay Senior was the seventh president of the Philippines, from 1953 until his death in an air crash in 1957.
- The Hukbong Bayan Laban sa Hapon or the People's Army Against the Japanese, popularly known as the Hukbalahap (Huk), was a prominent guerrilla outfit that fought the Japanese.
- Huk leaders were viewed with suspicion over their declaration of commitment to communism and the demand for peasant rights.
- Magsaysay drew upon his own experience of guerrilla warfare to initiate a two-pronged system of reforms and military campaigns. It was under his administrative and military policies that the Huk threat was considered to be neutralised.

The Ramon Magsaysay Award

- In 1957, the Ramon Magsaysay award was set up by trustees of the Rockefeller Brothers Fund and the Philippine government to carry forward Magsaysay's legacy of service to the people, good governance, and pragmatic idealism.
- In the six decades since 1958 – the first year the Award was given out – over 300 organisations and individuals have been recognised for their developmental endeavours crucial to Asia, and, consequently, to the world.
- The award is given out every year on August 31, on Magsaysay's birth anniversary.
- Prominent Indians who have won the award include Vinoba Bhave in 1958, Mother Teresa in 1962, Kamaladevi Chattopadhyay in 1966, Satyajit Ray in 1967, Mahasweta Devi in 1997.
- In recent years, Arvind Kejriwal (2006), Anshu Gupta of Goonj (2015), human rights activist Bezwada Wilson (2016), and journalist Ravish Kumar (2019) have won the award.

V.O. Chidambaram Pillai

Context

- The Prime Minister, Shri Narendra Modi paid tributes to freedom fighter V. O. Chidambaram Pillai on his birth Anniversary.

About

- He was popularly known as Kappalottiya Tamilan (The Tamil Helmsman).
- By 1906, VOC won the support of merchants and industrialists in Tuticorin and Tirunelveli for the idea of establishing a Swadeshi merchant shipping outfit by the name of the Swadeshi Steam Navigation Company (SSNCo).
- He established many institutions like Swadeshi Prachar Sabha, Dharmasanga Nesavu Salai, National Godown, Madras Agro-Industrial Society Ltd and Desabimana Sangam.

- VOC and Siva formed an organisation called the **Swadeshi Sangam, or 'National Volunteers'**.
- The nationalist movement acquired a secondary character with the beginning of the Tuticorin Coral Mills strike (1908).
- Prior to Gandhiji's Champaran Satyagraha (1917), VOC took up the cause of the working class in Tamil Nadu, and thus he is a forerunner to Gandhiji in this respect.

Dr. Sarvepalli Radhakrishnan

Context

- The President of India, Smt Droupadi Murmu, paid homage to Dr Sarvepalli Radhakrishnan, former President of India on his birth anniversary at Rashtrapati Bhavan (September 5, 2022).

About Dr Sarvepalli Radhakrishnan

He was **India's first Vice President and second President**.

- His book, '**The Philosophy of Rabindranath Tagore**' attracted global attention to Indian philosophy.
- His philosophy was grounded in **Advaita Vedanta**.
- He **defended Hinduism against "uninformed Western criticism"**
- **His other works include** Indian Philosophy, (1923-27), The Philosophy of the Upanishads (1924), An Idealist View of Life (1932), Eastern Religions and Western Thought (1939), and East and West: Some Reflections (1955).
- He was awarded **the Bharat Ratna** in 1954.
- He received a **knighthood in 1931** and honorary **membership of the British Royal Order of Merit in 1963**.
- He was elected **chairman of UNESCO's executive board in 1948**.
- He was one of the founders of **Helpage India**, a renowned NGO for elderly underprivileged in India.
- He had also formed **the Krishnarpan Charity Trust** along with Ghanshyam Das Birla and some other social workers in the pre-independence era.
- He was **the first Indian to hold a chair at the University of Oxford** – the Spalding Professor of Eastern Religion and Ethics (1936-1952)

Shumang Leela

Context

- The 50th All Manipur Shumang Leela Festival 2021-2022 kicked off at Iboyaima Shumang Leela Shanglen at Palace Compound in Imphal.

About

- Shumang Leela is a traditional form of theatre in Manipur and the roles of female artists are all played by male actors and male characters are played by female artists in case of female theatre groups.
- In 2017, Shougrakpam Hemanta was conferred with the prestigious Sangeet Natak Akademi Award in recognition of his contribution in Shumang Leela. With this, he became the first person to receive the award for this art form.
- Shumang Leela Groups of the early stage attempted to preserve and promote humanism, tolerance, confidence, devotion, truth and justice through their performances.

GEOGRAPHY

Floods in Odisha and Mahanadi

Context

- Floodwater in the Mahanadi river has hit the coastal region of Odisha inundating a large number of villages.

Impact

- As swirling floodwater made its way to coastal region, several river and canal embankments got breached. About 2 lakh people in 1366 villages in 10 districts have been affected. Hundreds of houses have been damaged while kharif crop in thousands of acres of land have gone under sea of water. There has been no report of any casualty in the ongoing flood in the State.

Mahanadi

- The origin of the Mahanadi occurs in the state of Chhattisgarh in

State	Drainage area (sq. km.)
Madhya Pradesh	75136
Orissa	65580
Bihar	635
Maharashtra	238
Total	141589

the highland region. It ends up in the Bay of Bengal. The other states that the river traverses through are **Maharashtra, Odisha, Bihar and Jharkhand.**

- It is bounded on the **north by the Central India Hills, on the south and east by the Eastern Ghats and on the west by the Maikala range.**
- The main soil types found in the basin are **red and yellow soils, mixed red and black soils, laterite soils, and deltaic soils.**
- **Major Projects:** Hirakud Dam, RavishankarSagar, Dudhawa Reservoir, Sondur Reservoir, HasdeoBango and Tandula.
- **Tributaries:** Its main tributaries are the Seonath, the Jonk, the Hasdeo, the Mand, the ib, the Ong and the Tel.
- Three important **urban centres in the basin are Raipur, Durg and Cuttack.** The Important industries presently existing in the basin are the Iron and Steel plant at Bhilai, aluminium factories at Hirakud and Korba, paper mill near Cuttack and cement factory at Sundargarh. Mining of coal, iron and manganese are other industrial activities.
- The various banks it touches are **Raipur, Betul, Bilaspur, Janjig, Subarnapur, Sambalpur, Anugul, Boudh, Kendrapada, Cuttack, Sonepur, Sambalpur, Subalaya, Birmaharajpur, Boudh.**

Read all about Floods here: <https://www.iasgyan.in/daily-current-affairs/floods>

River Rhine

Context

- Water levels on the Rhine river are very low because of unusually hot and dry weather, preventing many vessels from navigating it.

Rhine

- The Rhine is the **second longest river in Europe.** It flows 764 miles from the Swiss Alps to the Netherlands into the North Sea.
- The Rhine River's primary source is Vorherrhein at Tomasee, Surselva, in Switzerland.
- The Rhine River flows through several countries including **Germany, Austria, Switzerland, France, Netherlands, and Liechtenstein.**
- Its basin includes Luxembourg, Italy, and Belgium. The river runs through only one lake on its way, Lake Constance, which is on the border of Switzerland, Germany and Austria The Rhine has been an important transportation route since the days of the Roman Empire.
- Major cities along the Rhine include **Basel, Strasbourg, Karlsruhe, Mannheim, Ludwigshafen, Wiesbaden, Mainz, Koblenz, Bonn, Cologne, Leverkusen, Neuss, Krefeld, Duisburg, Arnhem, Nijmegen, Utrecht, and Rotterdam.**



Seti River

Context

- India will now develop two hydropower projects in Nepal, namely West Seti Hydropower Project and the Seti River Hydropower Project, 4 years after China withdrew from these.

Seti River

- The Seti River is an important tributary of the Karnali system that drains western Nepal.
- The Seti originates from the glaciers around the twin peaks of Api and Nampa in the south facing slopes of the main Himalayas.
- The area is near the trijunction of the borders of Nepal, India (Kumaon, Uttarakhand), and China (Tibet). The river first flows in many directions before joining the Karnali or Ghagra River. It has cut a spectacular gorge across the Mahabharat Range and appears to be lost amongst caves and tunnels for a short distance.

Karnali River System

- Karnali river system also originates from Macha-khabab of Tibet and flows through Nepal and meets Ghaghara river in India. Karnali river is the longest river flowing through Nepal. West Seti, Bheri, Kawari and Tila rivers are other tributaries of Karnali river system.



Geothermal Energy Project at Puga

Context

- ONGC has embarked upon a journey to generate electricity on a utility scale by tapping steam gushing from the earth's bowels at Puga.

Background

- Puga, and Chumathang area in general, are deemed as the most promising geothermal prospects. These areas were discovered in the 1970s and initial exploratory efforts were made in the 1980s by the Geological Survey of India. But nothing much happened till the Government in 2020 outlined a carbon-neutral vision for Ladakh.

About the Project

- The project will be set up at Puga-a remote valley located at an altitude of over 14,000 feet, off the road to Chumar on the de-facto border with China. This will be India's first geothermal energy project, and also the world's highest.

Importance of the Project

- The pilot already plant provides power and heating needs of the nearby settlements of Tibetan pastoralist refugee settlements at Sumdo and nearby areas. A bigger plant will provide 24X7 supply for the far-flung settlements and the large defence establishment in the eastern sector, reducing their dependence on diesel for running generators.
- The plant can also play a vital role as a stabilizer for the 15 gigawatt solar/wind project being planned in the nearby Morey plains.

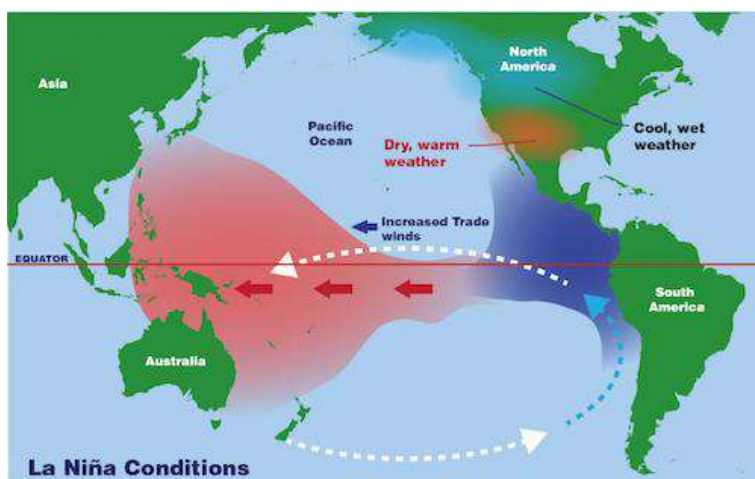
La Nina

Context

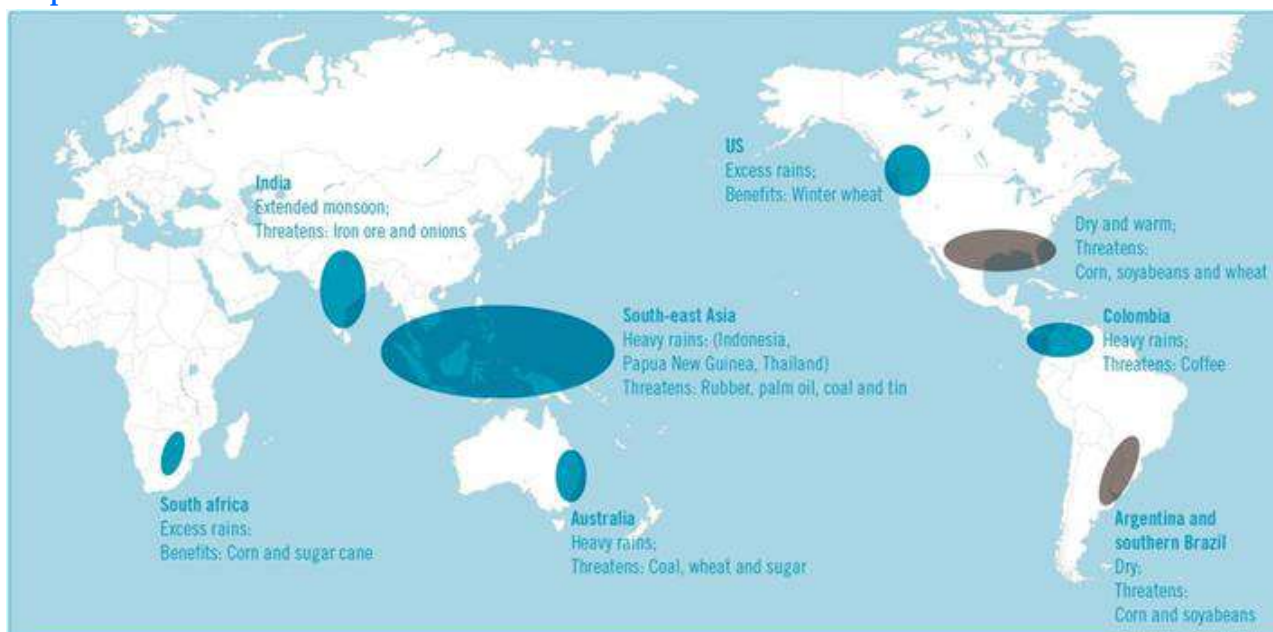
- Australia's Bureau of Meteorology (BOM) predicted that a third consecutive event of La Nina could be underway, leading to additional rainfall along its east coast this summer.

About

- La Niña is an oceanic and atmospheric phenomenon that is the colder counterpart of El Niño, as part of the broader El Niño-Southern Oscillation (ENSO) climate pattern.
- During a La Niña period, the sea surface temperature across the eastern equatorial part of the central Pacific Ocean will be lower than normal by 3-5 °C (5.4-9 °F).
- During La Niña events, trade winds are stronger than usual, pushing more warm water toward Asia. Off the west coast of the Americas, upwelling increases, bringing cold, nutrient-rich water to the surface.



Impact of La Nina



Read about ENSO in details here: <https://www.iasgyan.in/blogs/all-about-enso-and-mjo>

GS-II POLITY

Floor Test

In News

- The Chief Minister of Bihar won the floor test in the Bihar State Assembly, CM proved his majority first by voice vote and then by counting of votes.
- The CM has presently the support of the 164 members in the 243-member assembly.

Floor Test

- A floor test is a **standard to check whether the government is enjoying the confidence of the house or not.**
 - The floor test can be initiated both, at the Central (in Lok Sabha), as well as the state levels (in State Legislative Assembly).
- The **Indian constitution does not require a political party to have an absolute majority for forming the government** in the Lok Sabha or State Legislature.
 - The **constitution only mentioned that the political party in power must enjoy the confidence of the house.**
 - The Constitution states that whether the Government enjoy the confidence of the House or not, that is to be left to the House.
- Whenever the majority in the house is doubted, **the leader of the House requires to prove the majority by undergoing a Floor test.**
 - If the leader fails the floor test, he/she is bound to resign from his/her position, thus leading to the dissolution of the entire House.**
- Supreme Court in the SR Bommai case stated that **relief from the floor test can be made only under exceptional situations when the members of the House cannot express their opinion freely.**
- President/Governor can ask Government to prove a majority in the floor test.
 - President/Governor can summon the house without the aid and advice of the Council of Ministers if there are reasons to believe that the Government has lost confidence in the house.
 - The decision of the Governor, in this case, is not immune from judicial review.
- In several cases, the **Supreme Court highlighted that the Governor is authorized to issue a direction to Chief Minister to conduct a floor test and to prove the majority in the house.**

Indian Ports Bill 2022

About

- The Union government is in the process to introduce the drafts Indian Ports Bill, 2022 in the parliament.
- The draft IP Bill 2022 aims **to repeal and replace the existing 1908 Act.**
- **The objectives of the proposed bill:**
 - Consolidate and amend the laws relating to ports.
 - Prevent pollution at ports.
 - Ensure compliance with international maritime treaties.
 - Take measures for the conservation of ports.
 - Empower and establish State Maritime Boards for effective administration, control and management of non-major ports in India.
 - Provide adjudicatory mechanisms for redressal of port-related disputes.
 - Establish a National Council for promoting structured growth and development of the port sector.
 - Ensure optimum utilization of the coastline of India.
 - Promote cooperation between States and Centre-States through a consultative and recommendatory framework.
 - Promote transparency and cooperation in port development and other aspects through the use of data.

GOVERNANCE

National Anti-Doping Bill

In News

- The Lok Sabha has passed the **National Anti-Doping Bill to strengthen India's fight against doping in sports.**
 - Doping is the use of banned drugs by athletic to enhance their performance.

Background

- A 2019 report by **the World Anti-Doping Agency has placed India at 3rd among the nations with the most anti-doping rule violations.**
 - Only Russia and Italy were worse off.
- Doping charges hurt India's image and news of doping violations by Indian players in the Birmingham Commonwealth Games. Therefore it was felt to introduce a strong legal framework to curb doping in India.

Key Features of the Bill

- The main objective of the bill is **to strengthen the search, seizure and investigative powers of the National Anti-Doping Agency (NADA).**
- The Bill suggested **introducing reforms in the structure and functioning of NADA.**
 - NADA was established as a statutory body headed by a director general appointed by the Union Government.
- The Bill suggested **establishing a National Board for Anti-Doping in Sports** to make recommendations to the government on anti-doping regulations and compliance with international commitments on anti-doping.
- The bill is set to increase the power of NADA, according to the provisions of the bill **NADA will be authorized to plan, implement and monitor anti-doping activities and investigate violations.**
- As per the provisions of the Bill, "any violation of anti-doping rule may result in disqualification of results including forfeiture of medals, points and prizes, ineligibility to participate in a competition or event for a period, and financial sanctions."
- Currently, NADA cannot conduct raids if it suspects or has evidence of any doping activity.
 - Once the Bill becomes an Act, NADA will have the power to search and seize.
- **An independent Board will ensure time-bound resolution of cases.**

Other Steps were taken to curb doping

- The government is running anti-doping education awareness workshops and campaigns.
- The government is collaborating with IIT, National Institute for Pharmaceutical Education and Research, CSIR, National Forensic Science University and all other scientific agencies in the country to curb doping in sports.

Rohingyas

In News

- Hours after Minister for Urban Development Hardeep Singh Puri tweeted that all Rohingya migrants from Myanmar living in a camp in Delhi will be shifted to flats; the Ministry of Home Affairs (MHA) issued a strong denial.

About Rohingya

- Rohingya people** are a stateless ethnical group who mainly follow Islam and live in Rakhine State, Myanmar.
- They are **denied citizenship under Myanmar law**.
 - There are also restrictions on their freedom of movement, access to state education and government jobs.
- Myanmar's government does not identify the term "Rohingya" for them and prefers to call them "Bengali".
- The Rohingya population has **faced military crackdowns in Myanmar**, notably in 2016–2018, when most of them were forced out of the country, into neighboring Bangladesh.
 - They faced genocide in 2017.
 - The Rohingya population has risen to more than 1.2 million in Bangladesh, according to the latest estimation by the United Nations.
- There are nearly 40,000 Rohingya refugees in India and nearly 20,000 of them have been registered as refugees with the UNHCR.
- UN officials and Human Rights Watch have described Myanmar's persecution of the Rohingya as ethnic cleansing.
- They are described as **one of the most persecuted minorities in the world**.



Women in Politics

About

- A recently published report related to women's position in Indian electoral politics has raised concern that not a single women's movement in the last two decades has challenged the patriarchal and gender norms in Indian society.

Key points of the report

- Women have used several alternate methods to come to power.
 - Education and wealth have assisted women in political participation.
- Several Studies have suggested that women have started to organise themselves into economic groups, and financial freedom has pushed them to be more politically active.
- The declining **gap in voter turnout between men and women is a positive sign** toward gender inclusivity in the political sphere.
- The 2019 lok Sabha witnessed the **highest number of women (78) elected to the lower house of Parliament**.
 - However, this number still does not represent the actual proportion of women in the country.
- Politics and Political parties continue to be a male Dominated.
- Beyond a point, women within the political parties find it **difficult to rise within the party hierarchies**.
- Most of the women who are visible in politics and **have made a mark have entered through a family connection**.

Way Forward

- Need to **promote Gender sensitization of political parties** and Government bodies at the National, State and local level.
- Political parties must **focus on women's concerns, give tickets to women candidates, take strict action against those accused of gender violence or discrimination**, and include women at all levels of the party hierarchy.

SOCIAL JUSTICE

Beti Bachao Beti Padhao

In News

- The Union Ministry of Women and Child Development have presented a report to the Parliamentary Committee on the Empowerment of Women.
 - According to the report, **the funds allocated under the 'Beti Bachao, Beti Padhao' scheme were highly underutilized** due to a "lack of awareness and information" among people.
- Many activists had **raised concerns over the underutilization of funds as well as larger portion spending on advertising, instead of on the health and education of girls.**
- The Beti Bachao, Beti Padhao Programme aims to promote women's empowerment, by focusing on the girls' education and improving the sex ratio.

Background

- The Census of 2011 reflects a declining trend in the Child Sex Ratio (CSR) between 0-6 years with an all-time low at 918.
- A decline in CSR reflects:
 - Pre-birth discrimination through gender-biased sex selection.
 - Post-birth discrimination against girls (in form of their health, nutrition, and educational needs).

Beti Bachao Beti Padhao (BBBP) programme

- In 2015, the Union Government has launched the *Beti Bachao Beti Padhao (BBBP)* programme.
- It is a tri-ministerial effort of;
 - Ministry of Women and Child Development.
 - Ministry of Health & Family Welfare.
 - Ministry of Education (Earlier Ministry of Human Resource Development).
- Since 2021 the Ministry of Skill Development and Entrepreneurship and Ministry of Minority Affairs have also been added as partners.
- The programme only focuses on awareness campaigns and no provision of individual cash transfers by the Government.
- The scheme is now subsumed into Mission Shakti.
- **Objectives of the Scheme;**
 - Prevent gender-biased sex selective elimination.
 - Ensure the survival and protection of the girl child.
 - Ensure education and participation of the girl child.
 - Increase girls' participation in the fields of sports.
- **The scheme aims to achieve:**
 - Improvement in the Sex Ratio at Birth (SRB) by 2 points every year,
 - Improvement in the percentage of institutional deliveries or sustained at the rate of 95% or above.
 - 1% increase in enrolment at secondary education level and skilling of girls/women per year.
 - To check the dropout rate among girls at secondary and higher secondary levels.
 - Raising awareness about safe menstrual hygiene management (MHM)

Haryana's Cheerag Scheme

In News

- The state government of **Haryana has recently launched the Cheerag scheme to provide "free education" to Economically Weaker Section (EWS) students of government schools in the "budget" of private schools.**
- Under the scheme, government school students whose parent's annual income is less than Rs 1.8 lakh can enrol in private schools from Class II to XII.
- The government will provide monthly Support of;
 - Rs 700 per student from Classes II to V.
 - Rs 900 per student from Classes VI to VIII.
 - Rs 1,100 per student from Classes IX to XII.
- More than 530 "budget" private schools have applied under the Cheerag scheme to offer seats to EWS students.
 - However, the authorities found that only 381 schools were eligible due to various reasons.
- The selected 381 private schools have offered around 25,000 seats. However, less than 1700 students have

preferred to enrol on the scheme.

- According to some activists the scheme aimed at encouraging private schools at the cost of government schools.
 - They suggested that Instead of offering free education in private schools, the government should strengthen the infrastructure at government schools and fill the vacant posts of teachers.

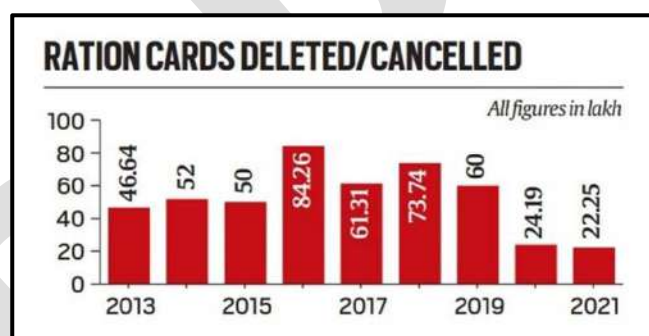
National Food Security Act

In News

- The Union government highlighted that **70 lakh beneficiaries under the National Food Security Act are "suspected" and states are suggested to initiate "ground verification"**.
- The government stated that between 2013 and 2021 nearly 4.74 crore ration cards have been deleted or cancelled by states.
 - A state-wise analysis of the data shows that the **highest of 1.73 crores cards were deleted/cancelled in Uttar Pradesh**.
 - UP was followed by West Bengal (68.62 lakh deleted/cancelled ration cards)
- Under the National Food Security Act (NFSA) of 2013, 81.35 crore people can be covered across the country.
 - As per Food Ministry data, the current NFSA coverage stands at 79.74 crores.

National Food Security Act, 2013

- The National Food Security Act, 2013 was notified to **provide food and nutritional security**.
- The **objective of the Act is to provide for food and nutritional security** in the human life cycle approach, by ensuring access to an adequate quantity of quality food at affordable prices to people to live a life with dignity.
- The Act **provides for coverage of up to 75% of the rural population and up to 50% of the urban population** for receiving subsidized foodgrains under the Targeted Public Distribution System (TPDS), thus covering about two-thirds of the population.
- The eligible persons will be entitled to receive 5 Kgs of foodgrains per person per month at subsidised prices of Rs. 3/2/1 per Kg for rice/wheat/coarse grains.
- The existing Antyodaya Anna Yojana (AAY) households, which constitute the poorest of the poor, will continue to receive 35 Kgs of foodgrains per household per month.
- Corresponding to the all-India coverage of 75% and 50% in the rural and urban areas, **State-wise coverage is determined by the Central Government**.
- The work of identification of eligible households is to be done by States/UTs.
- Pregnant women and lactating mothers and children in the age group of 6 months to 14 years are entitled to meals as per prescribed nutritional norms **under Integrated Child Development Services (ICDS) and Mid-Day Meal (MDM) schemes**.
- Children up to 14 years of age are entitled to nutritious meals as per the prescribed nutritional standards. In case of non-supply of entitled food grains or meals, the beneficiaries will receive a food security allowance.
- Besides meals to pregnant women and lactating mothers during pregnancy and six months after childbirth, such **women are entitled to receive maternity benefits of not less than Rs. 6,000**.
- The eldest woman of the household age 18 years or above be the head of the household to issue ration cards.
- Grievance redressal mechanism at the District and State levels. States will have the flexibility to use the existing machinery or set up separate mechanisms.



INTERNATIONAL RELATIONS

Yuan Wang 5

Context

- India is closely monitoring the movement of a Chinese "spy ship" that is on its way to Sri Lanka and will dock at its Hambantota port. The vessel's visit to the Lankan port comes at a time when the country is battling a severe economic crisis, and India is learnt to have already lodged a verbal protest against the ship's visit.

About

- The 'Yuan Wang 5', a Chinese research and survey vessel, is en route to Hambantota, a strategically important deep-sea port developed mostly using loans from Beijing.
- 'Yuan Wang'-class ships are used to track satellite, rocket and intercontinental ballistic missile (ICBM) launches.
- China has around seven of these tracking ships that are capable of operating throughout the Pacific, Atlantic, and Indian oceans. The ships supplement Beijing's land-based tracking stations.
- According to a US Department of Defence report, these space support ships are operated by the PLA's Strategic Support Force (SSF), which is "a theater command-level organization established to centralize the PLA's strategic space, cyber, electronic, information, communications, and psychological warfare missions and capabilities".
- The second-largest Lankan port, Hambantota sits on the route connecting Southeast Asia with Africa and West Asia.

Concerns for India

- The 'Yuan Wang 5' is a powerful tracking vessel whose significant aerial reach — reportedly around 750 km — means that several ports in Kerala, Tamil Nadu, and Andhra Pradesh could be on China's radar
- China hopes that the relevant parties will view and report on China's marine scientific research activities correctly and refrain from interfering with normal and legitimate maritime activities."

FIFA Banned India

Context

- Late on August 15, world football's governing body FIFA suspended the All India Football Federation (AIFF) indefinitely for "undue interference by a third party" in the process to finalise a new constitution and elect office-bearers.

About

- FIFA or the **Federation Internationale de Football Association** is the highest governing body of football in the world.
- It is the international governing body of association football, futsal, and beach soccer.
- **FIFA is a non-profit organisation.**
- **Founded in 1904, FIFA was launched to oversee international competition among the national associations of Belgium, Denmark, France, Germany, Netherlands, Spain, Sweden, and Switzerland.**
- FIFA now comprises 211 member nations.
- These national associations must each also be members of one of the six regional confederations into which the world is divided: Africa, Asia, Europe, North & Central America and the Caribbean, Oceania and South America.
- It is headquartered in Zurich.
- It is affiliated with the International Olympic Committee and is also a member of the International Football Association Board, which is responsible for setting the rules of football.

What is AIFF?

- The All-India Football Federation (AIFF) is the organization that manages the game of association football in India.
- **The AIFF was founded in 1937, and gained FIFA affiliation in the year 1948, after India's independence in 1947.**
- Currently, it has an office in Dwarka, New Delhi. India was one of the founding members of the Asian Football Confederation in 1954.

Why Did FIFA Ban the All-India Football Federation (AIFF)?

- President Praful Patel, also a FIFA council member, refused to relinquish his post as the head of football in the country.
- Despite the growing concerns about the working of AIFF, the Supreme Court of India intervened and removed Patel from his post.
- Further, The SC also appointed a Committee of Administrators (COA) to run the AIFF.
- As per FIFA Statutes, member federations should not be subject to legal and political interference in their respective countries.
- According to FIFA, to lift the ban on AIFF, it needs to follow the directives which are as follows:
 - The mandates of the COA would have to be repealed in full.
 - The AIFF administration would need to be completely in charge of its day-to-day running once again.

- The AIFF constitution is to be revised on the terms of FIFA and the Asian Football Confederation's (AFC) policies, and the election is to be held on current AIFF membership structures that are based on state associations only.

New Start Treaty

Context

- **Russia told the United States it would not allow its weapons to be inspected under the START nuclear arms control treaty for the time being because of travel restrictions imposed by Washington and its allies.**

Background

- The New START Treaty, which came into force in 2011, caps the number of strategic nuclear warheads that the United States and Russia can deploy, and the deployment of land- and submarine-based missiles and bombers to deliver them.
- U.S. President Joe Biden said that **his administration was ready to "expeditiously" negotiate a framework to replace New START, which is due to expire in 2026, if Moscow demonstrated its willingness to resume work on nuclear arms control.**
- But Russia's mission to the United Nations said Washington had withdrawn from separate talks with Moscow on strategic stability over the Ukraine conflict, and needed to decide what it wanted.

The Treaty

- It is a treaty between the United States of America and the Russian Federation on measures for the further reduction and limitation of strategic offensive arms.
- It came into force on 5th February, 2011.
- New START has replaced the 1991 START I treaty, which expired in December 2009, and superseded the 2002 Strategic Offensive Reductions Treaty (SORT), which terminated when New START entered into force.
- The START Framework of 1991 (at the end of the Cold War) limited both sides to 1,600 strategic delivery vehicles and 6,000 warheads.
- The May 2002 Strategic Offensive Reductions Treaty (SORT), also known as the Moscow Treaty, committed the United States and Russia to reduce their deployed strategic nuclear forces to 1,700-2,200 warheads apiece.
- It continues the bipartisan process of verifiably reducing the USA and Russian strategic nuclear arsenals by limiting both sides to 700 strategic launchers and 1,550 operational warheads.
- It was to lapse in February 2021, but after receiving renewal approval from USA and Russia, will be extended for a five-year period.

Dornier Aircraft

Context

- India handed over a Dornier aircraft to Sri Lanka in the presence of President Ranil Wickremesinghe, reaffirming its security ties with the island nation.

Details

- Security of India and Sri Lanka are enhanced by mutual understanding, mutual trust and cooperation.
- Gifting of Dornier 228 is India's latest contribution to this cause
- The gifting of the Dornier aircraft to the Sri Lanka Air Force "is of relevance to and a step to meet its requirements for maritime safety and security
- It is an example of India's strength, adding to the strength of its friends and neighbours, including those in Indian Ocean Region and the Bay of Bengal, such as Sri Lanka.
- The capability of the aircraft to undertake search and rescue operations "exemplifies its direct benefit to the people
- The Indian gift was in response to a request from the Sri Lankan government in 2018 for two Dornier Reconnaissance Aircraft to enhance the maritime surveillance capabilities of the island nation.
- Sri Lanka is a member of the 'Colombo Security Conclave', that began as a trilateral initiative involving India, Sri Lanka and the Maldives, and later included Mauritius, for maritime cooperation in the region.

Dornier 228

- **The Dornier 228 is a twin- turbodrop utility aircraft of the STOL (Short-Take off and Landing) variety.**
- It was designed by DASA Dornier, Fairchild - Dornier.
- **In 1983, a production licence was bought by Hindustan Aeronautics Limited (HAL) who set up a manufacturing unit of these aircrafts in Kanpur. About 124 aircrafts were built here.**
- The Dornier 228 is a general aircraft with twin engines capable of carrying at least 19 passengers.

HEALTH

Sickle Cell Disease

Context

- Health ministers of African countries launched a campaign August 23, 2022, to ramp up awareness and bolster prevention and care to curb the toll of sickle cell disease.

Sickle Cell Disease

- About:** Sickle cell disease is a group of disorders that affects hemoglobin, the molecule in red blood cells that delivers oxygen to cells throughout the body. People with this disease have atypical hemoglobin molecules called hemoglobin S, which can distort red blood cells into a sickle, or crescent, shape.
- Characteristic features:** Characteristic features of this disorder include a low number of red blood cells (anemia), repeated infections, and periodic episodes of pain. In this, due to sickling red blood cells break down prematurely, which can lead to anemia.
- Ramifications:** Anemia can cause shortness of breath, fatigue, delayed growth and development in children. The rapid breakdown of RBCs may cause yellowing of the eyes & skin, which are signs of jaundice. Painful episodes can occur when sickled RBCs, which are stiff and inflexible, get stuck in small blood vessels. These episodes deprive tissues and organs, such as the lungs, kidneys, spleen, and brain, of oxygen-rich blood and can lead to organ damage. Pulmonary hypertension occurs in about 10 % of adults with sickle cell disease.
- Treatment:** A blood and bone marrow transplant is currently the only cure for sickle cell disease, but there are effective treatments that can reduce symptoms and prolong life.

Tomato Flu

Context

- A new infection dubbed tomato flu, or tomato fever, has been detected in India.

Details

- About:** Tomato Flu is a rare viral disease, which causes red-coloured rashes, skin irritation and dehydration, and the disease gets its name from the blisters it causes, which look like tomatoes. It is a form of hand, foot and mouth disease (HFMD).
 - Cause:** The 'tomato flu' is caused by Coxsackie virus A 16. It belongs to Enterovirus family.
- [Note: Hand, foot, and mouth disease (HFMD) is a frequent febrile rash illness of childhood caused by enteroviruses (EV): Coxsackie A16 (CA16), EV A71, Coxsackie A6, Coxsackie B and Echo viruses.]
- Symptoms:** Fatigue, nausea, vomiting, diarrhoea, dehydration, swelling of joints, body aches, and common influenza-like symptoms, which are similar to those manifested in dengue.
 - Risk:** Till now, most of the reported cases of Tomato Flu are among children from age 1-9. The illness is rare in adults as they usually have immune systems strong enough to defend them from the virus. Young children are also prone to this infection.
 - Treatment:** The Tomato Flu or Tomato Fever is a self-limiting one and there are no specific drugs for it. Supportive therapy of paracetamol for fever and body ache. Other: isolation, rest, plenty of fluids, and hot water sponge for the relief of irritation and rashes.
 - Prevention:** Sanitization and hygienic surroundings are a must to stop the spread of Tomato Flu or Tomato Fever. Infected children must be kept in isolation till the symptoms have subsided completely. Infected children should avoid touching or scratching the blisters.

African Swine Fever

Context

- After Wayanad, African swine fever has been confirmed at a private pig farm in Kanichar Panchayat in Kannur district, of Kerala.

African swine fever

- About:** African swine fever (ASF) is a highly contagious haemorrhagic viral disease of domestic and wild pigs.
- Cause:** It is caused by a large DNA virus of the Asfarviridae family, which also infects ticks of the genus Ornithodoros.
- Transmission:** Direct contact with infected domestic or wild pigs; indirect contact, through ingestion of contaminated material (food waste, garbage); contaminated fomites, or biological vectors (soft ticks of the genus Ornithodoros) where present.

- **Public health risk:** ASF is **not a risk to human health**.
- **Symptoms:** High fever, depression, anorexia and loss of appetite, haemorrhages in the skin (redness of skin on ears, abdomen and legs), abortion in pregnant sows, cyanosis, vomiting, diarrhoea and death within 6-13 days (or up to 20 days).
- **Vaccine:** Currently there is **no approved vaccine for ASF**.
- **Prevention and Control:** Prevention in countries free of the disease depends on implementation of appropriate import policies and biosecurity measures, ensuring that neither infected live pigs nor pork products are introduced into areas free of ASF. This includes ensuring proper disposal of waste food from aircraft, ships or vehicles coming from affected countries and policing illegal imports of live pigs and pork products from affected countries.

Note: ASF is a disease listed in the World Organisation for Animal Health (OIE) Terrestrial Animal Health Code and must be reported to the OIE.

Pharmacopoeia Commission for Indian Medicine & Homoeopathy

Context

- The Government of India has established Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H), as a subordinate office **under Ministry of AYUSH**.

Details

- The Commission is engaged in **development of Pharmacopoeial Standards for Ayurvedic, Unani, Siddha & Homoeopathic drugs**. Further, PCIM&H is also acting as **Central Drug Testing cum Appellate Laboratory for Indian systems of Medicine & Homoeopathy**.
- Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H) has been formed by merging Pharmacopoeia Commission of Indian Medicine & Homoeopathy (PCIM&H) and the two central laboratories namely Pharmacopoeia Laboratory for Indian Medicine (PLIM), Ghaziabad and Homoeopathic Pharmacopoeia Laboratory (HPL).

Trivia: The National Ayush Mission

The Mission is a centrally sponsored scheme launched in 2014 by the Department of Ayush, Ministry of Health and Family Welfare (Now under the Ministry of AYUSH). The objective of the Mission is to promote the AYUSH systems of medicine through cost-effective services, strengthening its educational systems, quality control of AYUSH drugs and assuring the sustainable availability of AYUSH raw materials. AYUSH is the acronym for the medical systems that are being practised in India such as Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy. These systems represent a way of healthy living with established concepts on prevention of diseases and promotion of health.

GS-III ECONOMY

Financial Inclusion Index (FI-Index)

Context

- The Reserve Bank of India's composite financial inclusion index (FI-Index) capturing the extent of financial inclusion across the country rose to 56.4 in March 2022, showing growth across parameters.

The Index

- Reserve Bank of India's (RBI) financial inclusion (FI) index, was constructed **to capture the extent of financial inclusion across the country**.
- The index captures information on various aspects of financial inclusion in a single **value ranging between 0 and 100, where 0 represents complete financial exclusion and 100 indicates full financial inclusion**.
- The FI index was conceptualised as a comprehensive index incorporating details of banking, investments, insurance, postal as well as the pension sector in consultation with the government and respective sectoral regulators.
- The FI-Index has been **constructed without any 'base year'**, and is **published in July every year**. The FI-Index comprises three broad parameters:
 1. Access, with a weightage of 35 per cent;
 2. Usage with 45 per cent weightage; and
 3. Quality with 20 per cent weightage

- It incorporates details of banking, investments, insurance, postal as well as the pension sector.
- The Index is responsive to ease of access, availability and usage of services, and quality of services.

Development (Enterprise and Services) Hub Bill, 2022

Context

- The government plans to facilitate easier financing norms to activities pertaining to the manufacturing and services hubs envisaged under the proposed revamped law for Special Economic Zones (SEZs), also known as Development (Enterprise and Services) Hub Bill, 2022.

Details

- This will be done by **giving them infrastructure status, at par with sectors such as road, rail waterways, airports, to improve access to finance and enable long-term borrowing from lenders at easier terms.**
- The new draft DESH Bill **seeks to set up "development hubs"** for promoting economic activity, generating employment, integrating with global supply and value chains and maintaining manufacturing and export competitiveness, developing infrastructure facilities, promoting investments, including in research and development (R&D).
- Such hubs **will also include existing SEZs.**
- These development hubs will be further classified into **enterprise and service hubs.**
- While enterprise hubs will permit both manufacturing and services activities, services hubs will permit only services activities.
- **The new bill will replace the existing law governing SEZs.**
- The announcement of a new law was made by Finance Minister Nirmala Sitharaman in the Union Budget in February.
- **The idea is to develop large manufacturing and investment hubs and go beyond the export-oriented approach, making such zones compliant with World Trade Organization (WTO) norms, give these hubs access to the domestic market and enable easy entry and exits of units.**

External Sector Report 2022: IMF

Context

- The International Monetary Fund suggested India withdraw fiscal and monetary policy stimulus gradually, develop export infrastructure and scale up shipments by getting into free trade agreements with key trading partners, in a bid to maintain comfortable external sector balance over medium term.

More on the news

- These steps, the Fund said, should also be accompanied by further liberalisation of the investment regime and a reduction in tariffs, especially on intermediate goods.
- Amid a depreciation of the rupee against the dollar, the Fund suggested that interventions in the forex market be limited to "addressing disorderly market conditions".
- Given that the Reserve Bank of India (RBI) already has comfortable level of foreign exchange reserves despite recent drop (these are still enough to cover eight months of imports), accumulation of additional reserves is less warranted.
- The Fund has forecast India's current account deficit (CAD) to worsen to \$108 billion (3.1% of its GDP) in FY23 from \$38 billion (1.2% of GDP) in the last fiscal.

Blue Bonds

Context

- **Markets regulator SEBI has proposed the concept of blue bonds as a mode of sustainable finance, saying such securities can be utilised for various blue economy-related activities, including oceanic resource mining and sustainable fishing.**

Details

- India has tremendous scope for deployment of blue bonds in various aspects of the blue economy" like oceanic resource mining, sustainable fishing, national offshore wind energy policy and in the area of blue flag beach eco-tourism model that provide the tourists clean and hygienic bathing water facilities.
- According to the World Bank, **the blue economy is the "sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem".**
- India has a 7,500 kilometre-long coastline and 14,500 kilometres of navigable inland waterways, and the development of the blue economy can serve as a growth catalyst.

- At present, the blue economy comprises 4.1 per cent of India's economy.
- Further, the regulator has suggested adding two categories -- pollution prevention and control and circular economy adapted products -- as eligible green projects.
- **Sebi framework defines Green Debt Securities (GDS) as debt securities issued for raising funds that are to be utilised for projects or assets falling under certain categories.**
- The regulator has suggested that the issuer should inform investors about the intended types of temporary placement for the balance of unallocated net proceeds. Also, the utilisation of proceeds from each issue of GDS made by an issuer should be tracked and disclosed separately.
- In addition, the issuer should disclose any taxonomies, green standards or certifications, if referenced in the project selection.
- As per Sebi, the issuers should disclose information pertaining to reporting of the environmental impact of the projects financed by the green debt securities. This will enable investors to gather information pertaining to the impact of the project on the environment, it added.
- In order to enhance disclosure requirements for refinancing of projects through GDS, Sebi said that in the event that all or a proportion of the proceeds are to be used for refinancing, then the issuers should provide an estimate of the share of financing and refinancing.
- Besides, they should clarify which project portfolios may be refinanced and the expected look-back period for refinanced eligible green projects.
- **Indian companies raised nearly USD 7 billion through ESG (Environmental, Social and Governance) and Green bonds in 2021 compared to USD 1.4 billion in 2020 and USD 4 billion in 2019.**
- Most of the green bonds issued by Indian issuers are listed on offshore exchanges as issuers are finding it more attractive to list on bourses falling outside Sebi's framework.
- The regulator noted that one of the main hurdles for further growth has been a consistent and robust approach to identifying what is considered 'green'. A lack of clarity in this regard leads to greenwashing which is defined as the practice of channeling proceeds from green bonds towards projects or activities having negligible or negative environmental benefits, it added.

India's Tourism Market

Context

- **Outbound trips from India will surpass USD 42 billion by 2024** and the government could bring about certain policy changes to boost this growing market, a report said.

Details

- **The report' titled 'Outbound Travel and Tourism - An Opportunity Untapped'** by Nangia Andersen LLP in association with FICCI, highlights the up-and-coming Indian travel market and outline a framework for creating a more value for money experience for Indian tourists and travellers.
- To facilitate ease of doing business and promote the interests of Indian firms dealing in outbound travel the government could look at steps like increasing direct connections to popular and upcoming destinations, allowing foreign cruise vessels to operate on Indian waters, besides taking concerted and coordinated efforts on multiple fronts to propel the outbound tourism market, the report said.
- **The Indian outbound travel market is among the fastest growing markets globally with approximately 80 million passport level of purchasing power, especially among the middle class.**
- The report noted that **allowing foreign cruise vessels to include Indian destinations as a stop would encourage both inbound and outbound tourism as well as increase revenue for Indian ports.**
- **With a growing economy, young population, and growing middle class, India is ideally positioned to become one of the most lucrative outbound tourism markers in the world.**
- Europe sees 20 per cent of the travellers from India's outbound traffic. 10 per cent travel to Australia and New Zealand, while the rest of the traffic is towards South east Asia
- In 2021, Indians spent approximately USD 12.6 billion in outbound trips, compared to USD 22.9 billion in 2019. While the reason for decrease in spending could be due to the pandemic but these figures point out the huge value that can be captured from Indian outbound travellers, the report added.

Soil Mapping

Context

- A United Nations project is digitally mapping soil nutrients in sub-Saharan Africa (SSA) and central America to increase efficiency in using fertilisers.

Details

- The project is being carried out by Food and Agriculture Organization (FAO) — a specialised agency under the UN that leads international efforts to defeat hunger and improve nutrition and food security.
- The project has been fast-tracked and will organise and improve existing soil maps in Guatemala and Honduras, as well as other countries in central America and SSA.
- FAO is already supporting the scale-up of a soil-mapping project in Ethiopia. The project received a \$20 million contribution from the United States.
- The Ethiopian project used digital soil nutrient mapping technologies to generate timely information on how to optimize fertiliser use. It has already increased the yield and availability of high-quality grains in the country.
- **Fostering the creation of national soil databases and soil information systems as public goods to be used by policymakers, the private sector and especially farmers can generate long-term benefits.**
- It can improve short-term flexibility to adapt to trends in fertiliser markets and climate dynamics without compromising output.
- One in five people in Africa (20.2 per cent of the population) was facing hunger in 2021. The largest increase in moderate or severe food insecurity between 2020 and 2021 was seen in Africa. Within sub-Saharan Africa, Middle Africa is the sub-region facing the highest levels of food insecurity.
- **FAO said it was committed to enhancing soil fertility and is hosting a virtual global symposium on Soils for Nutrition, called Soils, where food begins, with Global Soil Partnership (GSP).**
- GSP is a globally recognised mechanism to promote sustainable soil management.
- Unsustainable agricultural practices, lack of resources and capacity development and nutrient underuse in SSA have resulted in significant soil nutrient depletion, low crop yields, and poverty, leaving many farm families in a scenario of vulnerability and food insecurity.
- Many African countries lack policies regulating soil as well as the capacity, knowledge and experience to plan and implement sustainable soil management programmes.
- As a matter of fact, Africa's Total Factor Productivity growth, especially in the sub-Sahara region, does not match up to the growth of other developing regions.
- **Total factor productivity growth is the difference between the growth of output and the growth of a combination of all factor inputs, usually labour and capital.**

Non-Fungible Tokens (NFTs)

Context

- In January Open Sea's monthly volumes for Ethereum shot over \$4.8 billion. OpenSea is said to be one of the largest NFT marketplaces.

What are NFTs?

- NFTs are digital assets whose ownership is verified through transaction records stored on blockchains. Art work, digital avatars and accessorised monkeys are some of the most commonly traded NFTs.
- In a nutshell, NFT means non-fungible tokens (NFTs), which are generally created using the same type of programming used for cryptocurrencies. In simple terms these cryptographic assets are based on blockchain technology. They cannot be exchanged or traded equivalently like other cryptographic assets.
- Like Bitcoin or Ethereum. The term NFT clearly represents it can neither be replaced nor interchanged because it has unique properties. Physical currency and cryptocurrency are fungible, which means that they can be traded or exchanged for one another.
- NFT stands for a non-fungible token, which means it can neither be replaced nor interchanged because it has unique properties.

Key Features of NFT

- **Digital Asset** - NFT is a digital asset that represents Internet collectibles like art, music, and games with an authentic certificate created by blockchain technology that underlies Cryptocurrency.
- **Unique** - It cannot be forged or otherwise manipulated.
- **Exchange** - NFT exchanges take place with cryptocurrencies such as Bitcoin on specialist sites.

How is an NFT Different From Other Cryptocurrencies?

- Although NFTs are created using the same kind of programming language as other cryptocurrencies, that's where the similarity ends.

Other Cryptocurrency	NFT
Cryptocurrencies are “fungible”; they can be traded or exchanged for one another. They’re also equal in value. For example, one Bitcoin is always equal to another Bitcoin, or one Dollar is always equal to one Dollar.	Each NFT acts as a digital signature that makes it impossible for them to be exchanged for or equal to one another. For example, The Last Supper is a painting of a kind and cannot be exchanged with another painting.

Multimodal Logistic Parks under Bharatmala Project

Context

- A tripartite agreement for swift development of modern Multi Modal Logistics Parks (MMLP) under Bharatmala Pariyojna across the country was signed with an **objective to centralize freight consolidation and reduce logistics cost from 14% to less than 10% of GDP at par with International Standards**. The tripartite agreement was signed by National Highways Logistics Management Limited (NHLML), Inland Waterways Authority of India (IWAI) and Rail Vikas Nigam Limited (RVNL).

Details

- MoU will provide seamless modal shift, MMLPs will ensure that cargo is swapped/shifted from and to Waterways, Dedicated Freight Corridors & Road Transport.
- This agreement is an earnest attempt towards realisation of empowering and energising the economies of scale via PM Gati Shakti.
- MMLPs are designed to untie the cobweb of logistics movement and enliven the logistics sector to put the economy into the fast lane of growth.
- MMLP will be a freight handling facility with rail and road accessibility, comprising of container terminals, cargo terminals (bulk, break-bulk), warehouses, cold storage, facilities for mechanised material handling and value-added services such as customs clearance with bonded storage yards, quarantine zones, testing facilities and warehousing management services etc. along with other associated facilities.
- Developed under a ‘Hub & Spoke’ model, the MMLP will integrate multiple modes of freight transport through highways, railways & inland waterways.
- The agreement underlines the cooperation & collaboration model between the three bodies in order to achieve efficiency in logistics movement within the country.
- The MMLP project is poised to develop state-of-the-art large scale warehousing facility for different types of commodities, to become one stop solution for all services related to cargo movement like warehousing, custom clearance, parking, maintenance of trucks etc.
- The MMLPs will focus on a technology driven implementation for a state-of-the-art freight management system. Many value added services like packaging, repackaging and labelling will be available in these projects.

About the Bharatmala Pariyojna

- Umbrella project under the Ministry of Road Transport and Highways.
- Develop 83,677 km of highways and roads at an investment of around Rs 7 lakh crores over the next five years.
- Construct 34,800 km of highways at a cost of Rs 5.35 lakh crores in Phase 1.

Component of the Project

- 9,000 km of economic corridors with a cost of Rs 1,20,000 crores
- Inter-corridors and feeder roads covering a length of 6,000 km at a cost of Rs 80,000 crores
- 5,000 km roads for national corridors’ efficiency improvement with Rs 1,00,000 crores
- Border and international connectivity roads stretching 2,000 km incurring Rs 25,000 crores
- 2,000 km of coastal and port connectivity roads with a cost of Rs 20,000 crores
- Expressways with a total length of 800 km with an expenditure of Rs 40,000 crores
- Residual National Highway Development Project (NHDP) stretches of 10,000 km at a cost of Rs 1,50,000 crores

GS-III

SCIENCE & TECHNOLOGY

Black Hole

Context

- NASA shared a haunting audio clip of a supermassive black hole located 250 million light-years away.

Black Hole


- A black hole is a place in space where gravity pulls so much that even light can not get out. The gravity is so strong because matter has been squeezed into a tiny space. They are so dense they create deep gravity sinks. This can happen when a star is dying. Because no light can get out, they are invisible.

STRUCTURE OF BLACK HOLES:

- **Singularity:**
The point where whole mass of a black hole is concentrated.
- **Photon Sphere:**
The outer edge where light bends but is still escapable.
- **Event Horizon:**
It is a "point of no return" around a black hole.
- **Accretion Disk:**
It is a disk of gases, dust, stars and planets that fall into the orbit of a black hole.

TYPES OF BLACK HOLES:

- **Stellar-mass Black Holes:**
Stellar-mass black holes are created when massive stars explode, leaving behind a black hole with the mass of just a few suns.
- **Supermassive Black Holes:**
Supermassive black holes exist in the hearts of galaxies and usually contain the mass equivalent to millions and billions of suns.
- **Intermediate Black Holes:**
Such bodies could form when stars collide in a chain reactions and usually contain the mass equivalent to hundreds and thousands of suns.



How Do Black Holes Form?

- Black holes are formed when giant stars explode at the end of their lifecycle. This explosion is called a supernova.
- The smallest black holes formed when the universe began.
- If the star has enough mass, it will collapse on itself down to a very small size. Due to its small size and enormous mass, the gravity will be so strong it will absorb light and become a black hole.
- Supermassive black holes were made at the same time as the galaxy they are in.

Who discovered the black hole?

- The idea of the black hole was first proposed by two different scientists in the 18th century: John Michell and Pierre-Simon Laplace. In 1967, a physicist named John Archibald Wheeler came up with the term "black hole".

Trivia

- Black holes can have the mass of several million suns.
- They don't live forever, but slowly evaporate returning their energy to the universe.
- The center of a black hole, where all its mass resides, is a point called a singularity.
- Black holes differ from each other in mass and their spin. Other than that, they are all very similar.
- The black holes we know about tend to fit into two size categories: "stellar" size are around the mass of one star while "supermassive" are the mass of several millions of stars. The big ones are located at the centers of large galaxies

Gagan

Context

- Boeing has informed that to make 787 plane compliant with GAGAN equipment major design change has to be carried out and given a time-frame of 4th Quarter of 2025. Accordingly, the exemption to Boeing 787 has been provided.

GAGAN

- GAGAN is an acronym for GPS Aided GEO Augmented Navigation. GAGAN is an Indian Satellite Based Augmentation System jointly developed by the AAI and the Indian Space Research Organisation.
- It aims to provide the best possible navigational services over Indian FIR (Flight Information Region) with the capability of expanding to neighbouring FIRs.
- GAGAN is a system of satellites and ground stations that provide GPS signal corrections, giving better position accuracy.
- GPS alone does not meet the ICAOs navigational requirements for accuracy, integrity and availability. GAGAN corrects for GPS signal errors caused by Ionospheric disturbances, timing and satellite orbit errors and also it provides vital information regarding the health of each satellite.

Services Offered

- Aviation, Forest management, Railways signalling, Scientific Research for Atmospheric Studies, Natural Resource and Land Management, Location based services, Mobile, Tourism.

How it works?

- GAGAN consists of set of ground reference stations positioned across various locations in India called Indian Reference Station (INRES), which gathers GPS satellite data.

- A master station, Indian Master Control Centre (INMCC) collects data from reference stations and creates GPS correction messages. The corrected differential messages are uplinked via Indian Uplink Station (INLUS) and then broadcasted on a signal from three geostationary satellites (GSAT-8, GSAT-10 and GSAT-15). The information on this signal is compatible with basic GPS signal structure, which means any SBAS enabled GPS receiver can read this signal.

Coverage Area

- Two GEOs simultaneously transmit the GAGAN signal in space. GAGAN GEO footprint expands from Africa to Australia and GAGAN system has capability to cater 45 reference stations for expansion to neighboring countries.
- GAGAN provides a civil aeronautical navigation signal consistent with International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs) as established by the Global Navigation Satellite System (GNSS) Panel.
- The GAGAN system provides Non-precision approach (NPA) service accurate to within the radius of 1/10th of a nautical mile over the Indian FIR as well as precision approach service of APV-1.0 (Approach with Vertical guidance) over the Indian landmass on nominal days.
- The system is interoperable with other international SBAS systems such as the U.S. Wide Area Augmentation System (WAAS), the European Geostationary Navigation Overlay Service (EGNOS), and the Japanese MTSAT Satellite Augmentation System (MSAS), and provides seamless air navigation across regional boundaries.

Hybrid Electric Vehicles

Context

- In recent months, automakers Maruti Suzuki, Toyota and Honda have launched hybrid electric vehicles in India.

Hybrid Electric Vehicle





- A hybrid electric vehicle (HEV) is a type of hybrid vehicle that combines a conventional internal combustion engine (ICE) system with an electric propulsion system. HEV is considered to have better performance and fuel economy compared to a conventional one.

Properties

- Auto-start/auto-shutdown** - To avoid wasting energy during idle time, the engine of a hybrid electric vehicle automatically shuts down and starts as soon as the accelerator is touched.
- Regenerative braking** - The energy wasted during braking and coasting is converted and stored in the battery, which is then used by the electric motor.
- Electric motor assist** - By helping the engine during passing, accelerating or moving up a hill, the electric motor allows the engine to be made smaller and more efficient in nature.

Advantages of HEV

- Oil consumption is less than that of conventional vehicles.
- Carbon-based emission is lower, which makes HEVs more eco-friendly. This also helps conserve non-renewable resources like petroleum.
- Maintenance costs are lower than those of conventional vehicles.
- As electric motor takes charge of the engine during long travels, more mileage can be achieved with HEVs compared to other vehicles.
- With the increase in total power and torque, HEVs can deliver instant torque and provide high torque even at low speeds.

TYPES OF ELECTRIC VEHICLES			
EV (Electric Vehicle)	HEV (Hybrid Electric Vehicle)	PHEV (Plug-in Hybrid Vehicle)	MHEV (Mild Hybrid Vehicle)
<ul style="list-style-type: none"> No IC engine Only electric drive Battery pack size is large (20-80 kWh) Example: Nissan Leaf, Tesla Model S 	<ul style="list-style-type: none"> Has IC engine and electric motor The batteries get charged by the engine Battery pack size is medium (6-12 kWh) Example: Honda Civic Hybrid 	<ul style="list-style-type: none"> Has IC engine and electric motor The batteries can be charged from an external source (plug) Example: BMW i-8 	<ul style="list-style-type: none"> IC engine and electric motor Turns off the engine and switches to motor when coasting, braking and restarting quickly Cannot be solely driven on electric motor Example: Chevrolet Silverado Hybrid
			

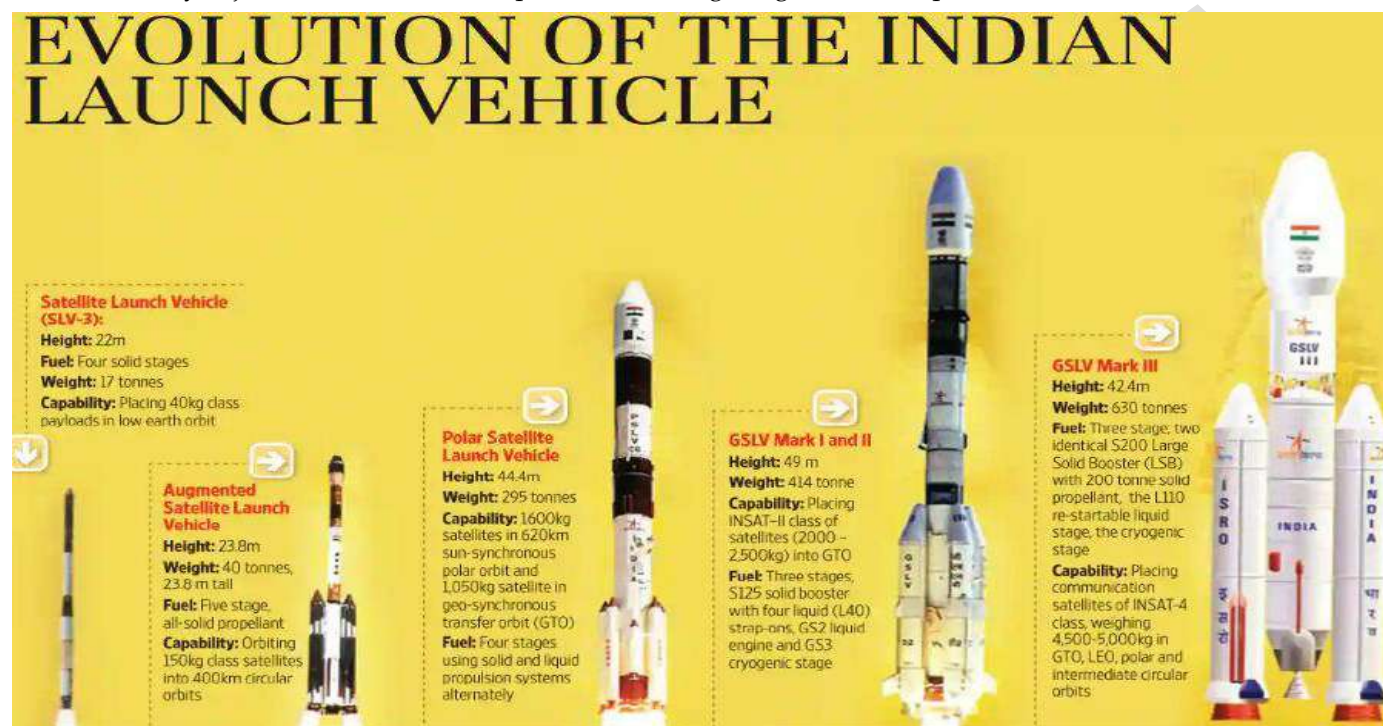
ISRO's SSLV

Context

- Recently, ISRO got ready for the first developmental flight of the SSLV-D1/EOS-2 mission. The launch took place from the Satish Dhawan Space Centre at Sriharikota. However, the mission failed to place the satellites in their required orbits.

Launch vehicle

- Satellites don't go into the space on their own. They are carried there by launch vehicles, or rockets, like the PSLV.
- The rockets/launch vehicles have powerful propulsion systems that generate the huge amount of energy required to lift heavy objects like satellites into space, overcoming the gravitational pull of the earth.



SSLV

- About:** The Small Satellite Launch Vehicle (SSLV) is a **small-lift launch vehicle developed by ISRO**.
- Capacity:** It has a **payload capacity to deliver 500 kg** to low Earth orbit (500 km) or 300 kg to Sun-synchronous orbit (500 km) for launching small satellites, with the capability to support multiple orbital drop-offs.
- Objective:** The SSLV has been developed with the aim of launching small satellites commercially at drastically reduced price and higher launch rate as compared to Polar Satellite Launch Vehicle (PSLV). SSLV is made keeping low cost, low turnaround time in mind with launch-on-demand flexibility under minimal infrastructure requirements.
- Recently Failed Mission:** The maiden flight SSLV-D1 was conducted on 7 August 2022, from the First Launch Pad, but failed to reach orbit.
- Dedicated Launch Site:** In the future, a dedicated launch site called SSLV Launch Complex (SLC) near Kulasekharapatnam in Tamil Nadu will handle SSLV launches to Sun-synchronous orbit.
- Post operational phase:** After entering the operational phase, the vehicle's production and launch operations will be done by a consortium of Indian firms along with NewSpace India Limited (NSIL).

Must Read: <https://iasgyan.in/daily-current-affairs/small-satellite-launch-vehicle-47>

Facial Recognition Technology

Context

- In a recent RTI (Right to Information) filed by the Internet Freedom Foundation (IFF) on the use of facial recognition technology (FRT) in policing, the Delhi Police has revealed that it considers face similarity check above 80 per cent as positive results and uses them to arrest alleged rioters.

Facial Recognition System

- A facial recognition system is **a technology capable of matching a human face from a digital image** or a video frame against a database of faces. Face recognition systems **use computer algorithms to pick out specific, distinctive details about a person's face**. These details, such as distance between the eyes or shape of the chin, are

then converted into a mathematical representation and compared to data on other faces collected in a face recognition database.

- Unlike fingerprints and DNA, which do not change during a person's life, facial recognition has to take into account different factors, such as: Ageing, Plastic surgery, Cosmetics, Effects of drug abuse or smoking, Pose of the subject.
- Computerized facial recognition is a relatively new technology, **being introduced by law enforcement agencies around the world in order to identify persons of interest.**

Bioengineered Cornea

Context

- For the first time, researchers in Sweden have been able to create a successful alternative — bioengineered cornea.

Details

- Bioengineered cornea implants were made of collagen derived from pig skin. The implant was used to successfully restore the vision of 20 people in India and Iran, most of whom were blind due to keratoconus, a disease that leads to thinning of the cornea.
- As a substitute for human corneas, the researchers utilized medical-grade collagen derived from pig skin, a byproduct of the food industry that is already used in medical devices for glaucoma surgery.

Method and Research

- The researchers developed a minimally invasive method without the use of stitches, where a small incision is made in the patient's eye, and the implant is inserted over the existing cornea. This can be done by using readily available surgical instruments.
- This new method was used by surgeons in India and Iran, where there is a lack of donated corneas. Not only was the procedure safe for all 20 participants, the researchers found that 2 years after the operation, none of the patients were blind anymore.

Significance

- There is a severe shortage of corneas, with only one available for 70 patients. Logistical and storage difficulties, along with expensive surgical equipment, further burden those living in low- and middle-income countries in Asia, Africa, and the Middle East.
- **Bioengineered Cornea is not only cheaper and easier to access than donated corneas, but requires a less invasive procedure** and can be stored for a significantly longer period — up to two years.
- The results show that it is possible to develop a biomaterial that meets all the criteria for being used as human implants, which can be mass-produced and stored up to two years and thereby reach even more people with vision problems.

Quantum Key Distribution (QKD) Technology

Context

- The Indian Army has started the process of procurement of Quantum Key Distribution (QKD) technology.

About QKD

- QKD is primarily a **mechanism to undertake secure communication with a cryptographic protocol** involving various components of quantum mechanics. The communication method uses properties found in quantum physics to exchange cryptographic keys in such a way that is provable and guarantees security.
- The technology enables two sides to come up with random secret keys shared by both and known exclusively to them, so only they can use it to encrypt and decrypt messages, thus achieving a very highly-secure communication.
- QKD helps create **a non-hackable quantum channel for creating unhackable encryption keys** that are used to encrypt critical data or voice or video across the end points.

How does QKD work?

- QKD works **by transmitting many light particles, or photons, over fiber optic cables between parties.** Each photon has a random quantum state, and collectively, the photons sent make up a stream of ones and zeros. This stream of quantum states that make up ones and zeros are called qubits -- the equivalent of bits in a binary system. When a photon reaches its receiving end, it'll travel through a beam splitter, which forces the photon to randomly take one path or another into a photon collector. The receiver will then respond to the original sender with data regarding the sequence of the photons sent, and the sender will then compare that with the emitter, which would have sent each photon. Photons in the wrong beam collector are discarded, and what's left is a specific sequence of bits. This bit sequence can then be used as a key to encrypt data. Any errors and data leakage are removed during a phase of error correction and other post-processing steps. Delayed privacy amplification is

another post-processing step that removes any information an eavesdropper might have gained about the final secret key.

Significance of developing QKD in India

- The development of indigenously QKD technology is a milestone achievement in 'Azadi Ka Amrit Kaal' and a befitting success story of 'Aatmanirbhar Bharat'. India is all set to join the league of global leaders with indigenous and more advanced quantum communication technology in order to equip its Armed Forces with high end defence.

DEFENCE & SECURITY

EX VINBAX 2022

Context

- 3rd edition of Vietnam-India Bilateral Army exercise to begin at Chandimandir.

Details

- The exercise is a sequel to a previously conducted bilateral exercise in Vietnam in 2019 and a major milestone in strengthening the bilateral relations between India and Vietnam.
- India and Vietnam share a Comprehensive Strategic Partnership and defence cooperation is a key pillar of this partnership.
- Vietnam is an important partner in India's Act East policy and the Indo-Pacific vision.
- The theme of Ex VINBAX - 2022 is the employment and deployment of an Engineer Company and a Medical Team as part of the United Nations Contingent for Peace Keeping Operations.
- India has a rich legacy of deployment of troops in United Nations missions and has some of the best capacities to impart United Nations peace operations training incorporating best practices and hands-on training to prospective United Nations peacekeepers at tactical, operational and strategic levels.



AL NAJAH-IV

Context

- The fourth edition of India-Oman joint military exercise 'AL NAJAH-IV' between contingents of Indian Army and the Royal Army of Oman is scheduled to take place at the Foreign Training Node of Mahajan Field Firing Ranges.
- A 60-member team from the Royal Army of Oman has arrived at the site. The Indian Army will be represented by troops from the 18 Mechanised Infantry Battalion.
- The previous edition of the exercise was organised in Muscat in March 2019.

Exercise Pitch Black

Context

- Indian Force will join 16 other nations for Exercise Pitch Black, hosted by the Australian Air Force.

About

- It's a biennial exercise to enhance interoperability and strengthen relationships among participants.
- India has other exercises with Australia as well: Ex Austra Hind (Army), Ex Ausindex (Navy)

Hellfire R9X Missile

In News

- US President Joe Biden has confirmed that a US drone missile strike had killed Al Qaeda chief 'Ayman al Zawahiri'.
- He was the chief plotter of the 9/11 terrorist attack on the US.
 - The President has also informed that no casualties among the civilians happened in the attack.

Hellfire R9X Missile

- Hellfire R9X missile is a **modified version of the Hellfire missile**.
 - The Hellfire missile was an **anti-tank weapon developed in the 1980s and was later modified many times to target individuals**.
- The missile can shoot more than 100 pounds of metal in order to **kill its target**, be it a car or building.
 - The most lethal aspect of the R9X is its 6 long blades that can shred anything in its tracks.
- The Hellfire R9X missile was **developed to minimize civilian deaths and developed during President Barack Obama**.



AGM-88 HARM

Context

- Washington has supplied some "anti-radiation missiles" to Ukraine, which could be fired from some **Ukrainian Air Force aircraft**. The statement has put meat on Russian allegations that an American anti-radar missile, AGM-88 HARM, which is part of NATO's inventory, has been used in the theatre of conflict.

What is the AGM-88 HARM missile?

- The acronym 'HARM' in the AGM-88 HARM air-to-surface missile stands for **High-Speed Anti-Radiation Missile**.
- It is a tactical weapon fired from fighter aircraft, and has the capability to detect and home into radiation emitted by hostile radar stations that have surface-to-air detection capabilities.
- The missile was originally developed by the Dallas-headquartered Texas Instruments, but is now produced by the major American defence contractor Raytheon Corporation.
- The AGM-88 HARM is 14 metres in length, but only 10 inches in diameter. It weighs around 360 kg and carries a fragmentation type warhead that is optimised for radar targets. It also has an anti-radar homing seeker broadband RF antenna and receiver, and a solid state digital processor.
- The missile has a range of more than 100 km.

Alpha Ship

Context

- In a fortnight, India's maiden indigenous aircraft carrier built at the Cochin Shipyard will be part of the naval fleet as **INS Vikrant, taking on the name, the crest and pennant number (R11) of India's first aircraft carrier**.

Details

- The project got under way in 2007 and the keel was laid in 2009.
- The 262-metre-long ship, with a full displacement of about 45,000 tonnes, is powered by four gas turbines with a capacity of 88 MW and **can cruise at speeds of up to 28 knots**.
- Designed indigenously and built at a cost of about ₹20,000 crore**, the carrier can take on nearly 30 aircraft, both fixed-wing and helicopters, of assorted variety.
- Initially, it will be the MiG-29K fighters and Ka-31 helicopters that will be operating from the ship. But depending on the government's decision, INS Vikrant could get Rafale (M) or the F-18 Super Hornet fighters.

- The MH-60R multi-role helicopters that have already been delivered to India will join the air arm of the carrier, once inducted.
- The ship will be manned by nearly 1,700 personnel under the Commanding Officer (designate) Commodore Vidhyadhar Harke.
- The significance of INS Vikrant is that it gave a fillip to indigenisation of ship-building materials and processes.

Tejas

Context

- Argentina has expressed interest in the Made in India TEJAS fighter aircraft for Argentine Air Force. External Affairs Minister Dr. S Jaishankar acknowledged Argentine interest in the TEJAS fighter aircraft and highlighted the importance of the proposal in enhancing the strategic quotient of bilateral relationships.

LCA Programme: Background

- In 1983, the Government of India established the LCA project with the initial goal to develop a new light combat aircraft to replace the ageing IAF fighters, especially the MiG-21 variants.
- In 1984, the Government of India established Aeronautical Development Agency (ADA) under the aegis of Defence Research and Development Organisation (DRDO) to manage the LCA programme.

Tejas under LCA Programme

- The HAL Tejas is an Indian, single engine, delta wing, light multirole fighter.
- In 2003, the LCA was officially named "Tejas". It is the **smallest and lightest** in its class of contemporary supersonic combat aircraft.
- The Tejas is the second supersonic fighter developed by HAL after the HAL HF-24 Marut.
- The Tejas currently has three production models – Tejas Mark 1, Mark 1A and trainer variant.

Tejas to add teeth to Indian air combat



Indigenously developed Light Combat Aircraft (LCA), Tejas has been formally inducted to Indian Air Force. The induction occurred almost 15 years after its first test flight and 33 years after the project was taken up

Project first conceived and launched in 1983	Maiden test flight took place on Jan 4, 2001	Designed for air-to-air, air-to-ground and air-to-sea combat roles	Intended to replace the phased out MiG-21 fighter jets
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Specifications (LCA AF MK2)

Crew	Length	Height	Wingspan	Max speed	Engine
One	13.7 m	4.4 m	8.2 m	1.6 mach	GE-F414-INS6

Smallest and lightest multi-role supersonic fighter aircraft of its class.

First advance Fly-by-wire (FBW) fighter aircraft designed, developed and manufactured in India

Project executed by Aeronautical Development Agency (ADA) along with Hindustan Aeronautics Limited (HAL)

Inducted on July 1, 2016 into Squadron No. 45 of IAF, also called the "Flying Daggers"

KBK Infographics



INS Sumedha

Context

- As part of the Indian Navy's long-range operational deployment, Indian Naval Ship, INS Sumedha visited Port Klang of Malaysia.

Details

- INS Sumedha's visit to Port Klang is aimed at **strengthening bilateral ties, enhancing maritime cooperation and inter-operability** between Indian and Royal Malaysian Navies.
- Both navies have been collaborating on various fronts and are playing a critical role in ensuring Maritime Security and Safety of global commons.
- INS Sumedha is an indigenously built Naval Offshore Patrol Vessel deployed for multiple roles independently and in support of Fleet Operations.



- Port Klang is a town and the main gateway by sea into Malaysia. Known during colonial times as Port Swettenham but renamed Port Klang in July 1972, it is the largest port in the country.

Exercise VAJRA PRAHAR 2022

Context

- The 13th Edition of India - USA Joint Special Forces Exercise VAJRA PRAHAR 2022 culminated at Bakloh (HP).

Details

- This annual exercise is hosted alternatively between India and the United States.
- The 12th edition was conducted at Joint Base Lewis Mc Chord, Washington (USA) in October 2021.
- The 21-day joint training provided an opportunity for the Special Forces from both nations to train in Air Borne Operations, Special Operations and Counter Terrorism operations in a joint environment under United Nations Charter.
- The exercise was conducted in two phases; the first phase involved combat conditioning and tactical level special missions training exercises and the second phase included 48 hours of validation of training received by both contingents in the first phase.

Combined Maritime Forces

Context

- India has formally started cooperation with the Combined Maritime Forces (CMF): a Bahrain-based multilateral partnership.
- Recently, at the India-U.S 2+2 dialogues, India announced that it would join the Combined Maritime Forces (CMF) as an Associate Partner.
 - Associate members to provide resources, personnel and cooperative engagement based on the needs and requirements.
- The Indian Navy could be contributing a warship whenever required.

Combined Maritime Forces

- It is a multinational naval partnership to promote security, stability and prosperity.
- This is a 34 members grouping commanded by a U.S. Navy Vice Admiral.
- The maritime forces are based in Bahrain and undertake counter-terrorism, counter-piracy and regional cooperation.
- Pakistan is a full member of the Combined Maritime Forces.
- It comprises three task forces:
 - CTF 150 (maritime security and counter-terrorism).
 - CTF 151 (counter-piracy).
 - CTF 152 (Arabian Gulf security and cooperation).
- It is a flexible organization and members are not bound by either a political or military mandate.
- India has in the past cooperated with CMF on various occasions.

Significance of the Step

- It would strengthen cooperation in regional security in the western Indian Ocean.
- It will deepen the multilateral engagements by the Indian Navy and widen military diplomacy.
- This will promote India as a responsible maritime security partner in the Indian Ocean.



Him- Drone-A-Thon

Context

- The **Indian Army in collaboration with the Drone Federation of India** has launched the 'Him Drone-a-thon' programme.

Details

- This initiative in line with Atmanirbharta in defence manufacturing is aimed to catalyse and provide focused opportunities to the Indian drone ecosystem to develop path-breaking drone capabilities for meeting requirements of frontline troops.
- **The Indian Army's support to the indigenous drone ecosystem is based on the principle that 'good available indigenously' is better than the 'best available globally'.**
- However, gradual enhancement in technology demanded by defence forces is likely to incentivise manufacture of better and more capable drone products.
- **The 'Him Drone-a-thon' programme is pan India sustained connect between all stake holders including industry, academia, software developers and drone product manufacturers.**
- It will be conducted in stages with quantifiable parameters (like altitude, weight, range, endurance etc) being progressively enhanced based on demonstrated capabilities.
- Broad activities planned include interactions & ideation between users, development agencies, academia etc, seeking of industry responses, visits by development agencies to operational locations to understand the ground perspective & requirements, handholding of development agencies for internal development & on-ground trials and actual conduct & evaluation of drone products.
- **As a start point, development in the following categories are included:-**
 - Logistics/ Load carrying Drone in High Altitude Areas.
 - Autonomous Surveillance/ Search & Rescue Drone.
 - Micro/ Nano Drones for Fighting in Built Up Areas.

Advanced Towed Artillery Gun System (ATAGS)

Context

- **The indigenous howitzer was used in Independence Day 21-gun salute.** Prime Minister Narendra Modi also referred to the gun while speaking about the Atmanirbhar Bharat initiative of the Centre during his Independence Day speech.

About

- The ATAGS is an indigenous 155 mm x 52 calibre howitzer gun developed by the DRDO with its Pune-based facility Armament Research and Development Establishment being the nodal agency.
- **Developed by the DRDO, the Advanced Towed Artillery Gun System (ATAGS) was used alongside the traditional British-origin '25 Pounders' artillery guns.**
- When the National Anthem is played by the Military Band after the unfurling of the Tricolour at the Red Fort by the Prime Minister, a 21-volley gun salute is fired by a ceremonial battery from an artillery regiment.
- Howitzers is an umbrella term for a category of long-range artillery guns.
- **The ATAGS project was started in 2013 by DRDO to replace older guns in service in the Indian Army with a modern 155 mm artillery gun.**
- **In August and September 2017, a record target range of around 48 km was achieved at Pokhran Field Firing Range.**
- The system has subsequently undergone various levels of trials in different weather and terrain conditions.
- The armament system of ATAGS mainly comprises barrel, breech mechanism, muzzle brake and recoil mechanism to fire 155 mm calibre ammunition held by Army with a longer range, accuracy and precision and provides greater firepower.
- **The ATAGS is configured with all electric drive to ensure maintenance free and reliable operation over a longer period of time.**
- It has advanced features in terms of high mobility, quick deployability, auxiliary power mode, advanced communication system, automatic command and control system with night firing capability in the direct fire mode.
- The specialised gun system is compatible with C4I (command, control, communications, computers, and intelligence) systems like the Artillery Combat Command and Control System (ACCCS) called Shakti for technical fire control, fire planning, deployment management, and operational logistics management of the Army.
- The development process of ATAGS by the DRDO coincides with development of Howitzer Dhanush for Advanced Weapons and Equipment India of the erstwhile Ordnance Factory Board.

NIDAAN Portal

Context

- A first-of-its kind database of arrested narcotics offenders has been made operational for use by various central and State prosecution agencies tasked to enforce anti-drugs laws in the country.

Details

- The portal — NIDAAN or the **National Integrated Database on Arrested Narco-offenders** — has been developed by the Narcotics Control Bureau (NCB).
- It is part of the narcotics coordination mechanism (NCORD) portal that was launched by Union Home Minister Amit Shah in Chandigarh during the national conference on 'Drug trafficking and national security'.
- The NIDAAN platform **sources its data from the ICJS (inter-operable criminal justice system) and the e-Prisons (a cloud-based application) repository and it is planned to integrate it in the future with the crime and criminal tracking network system or CCTNS.**
- The ICJS, an initiative of the Supreme Court e-committee, was created to enable seamless transfer of data and information among different pillars of the criminal justice system, like courts, police, jails and forensic science laboratories, from one platform.
- NIDAAN is a one-stop solution for all narcotics offenders' related data and will help investigative agencies as an effective tool to connect the dots while probing narcotics cases
- The idea to create such a portal was to enhance the capability of all the law enforcement agencies working against drug crimes.
- The login ID and password for the portal for use by various central and State anti-drugs units can either be obtained from the CCTNS administrator and those agencies who already have login credentials at the ICJS portal can use the same to operate NIDAAN.
- **A distinct feature called 'criminal network' on the portal can also be accessed by agencies, as part of which specific links of an accused to other crimes, linked police FIRs and those who visited them in jail can also be accessed.**
- The NIDAAN portal is a vertical envisaged under the NCORD and was mooted during a national meeting on drug issues chaired by Home Minister Amit Shah in December last year in Delhi.

ENVIRONMENT & ECOLOGY

American Bullfrog and the Brown Tree Snakes

Context

- Two invasive species, the American bullfrog and the brown tree snakes, have cost the sphere an assessment of \$16 billion.

Details

- The estimated dip in the world economy is recorded between 1986 and 2020.
- The species have caused issues ranging from crop destruction to power cuts, as per a study.
- **The brown tree snakes have the most significant impact on Pacific islands, and the amphibian breed of the American bullfrog multiplied uncontrollably in Europe.**
- **The brown-and-green frog known as lithobates catesbeianus that can weigh over 2 pounds (0.9 kilos), had the greatest impact in Europe.**
- **The brown tree snake, or boiga irregularis, has multiplied uncontrollably on Pacific islands including Guam and the Marianna Islands, where the species was introduced by U.S. troops in World War II.**
- The snakes have at times been so abundant that they caused power outages by crawling on electrical equipment.
- This signals the need for investment controlling global transport of invasive species to avoid paying for mitigation after the invasions occur.

Wildlife Protection Amendment Bill 2021

Context

- The Wild Life (Protection) Amendment Bill, 2021 was passed by Lok Sabha.

Details

- The bill aims to implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora and expand the number of species protected by the convention.

- CITES is a convention that requires countries to regulate the trade of all listed specimens through permits and regulate the possession of live animal specimens so it does not threaten the survival of the species.
- **The previous Wild Life (Protection) Act, 1972 had six schedules for specially protected plants (one), specially protected animals (four), and one vermin species (small animals that carry disease and destroy food).**
- **The amended bill reduces the total number of schedules to four by eliminating the schedule for vermin species and reducing the number of schedules for specially protected animals to two.**
- **It also inserts a new schedule for specimens listed under CITES.**
- **The Bill provides for the central government to designate an authority which grants export or import licences for the trading in specimens.** Anyone who trades in a scheduled specimen must inform the appropriate authority of the transaction's specifics.
- The authority may use an identification mark for a specimen which, the bill, prohibits any person from removing or modifying. Additionally, people possessing live specimens of scheduled animals must obtain a registration certificate from the Management Authority.
- **The Bill gives the government the authority to control or outlaw the import, trade, and possession of invasive alien species, or those that are not indigenous to India.**
- The bill increases the penalty for violations of the provisions of the bill. Under the 1972 act, the general fine was up to ₹25,000 which has been increased to ₹1,00,000. For violating the provisions meant for specially protected animals, the previous fine was up to ₹10,000 and now has been increased to at least ₹25,000.
- The bill will also ensure greater control and regulation of wildlife sanctuaries and empower the government to notify a conservation reserve, an area located next to sanctuaries or national parks to protect the flora and fauna.
- Additionally, the bill provides for any person to voluntarily surrender any captive animals or animal products for which no compensation will be awarded and the items will become the property of the state government.

Battery Waste Management Rules, 2022

Context

- Ministry of Environment, Forest and Climate Change, Government of India published the Battery Waste Management Rules, 2022 to ensure environmentally sound management of waste batteries.

Details

- Notification of these rules is a transformative step towards implementation of the announcement made by Prime Minister Shri Narendra Modi in his address to the Nation on Independence Day on 15th August, 2021 **to promote Circular Economy in full earnest.**
- New rules will **replace Batteries (Management and Handling) Rules, 2001.**
- The rules **cover all types of batteries**, viz. Electric Vehicle batteries, portable batteries, automotive batteries and industrial batteries.
- The rules function based on the concept of **Extended Producer Responsibility (EPR)** where the producers (including importers) of batteries are responsible for collection and recycling/refurbishment of waste batteries and use of recovered materials from wastes into new batteries.
- EPR mandates that all waste batteries to be collected and sent for recycling/refurbishment, and its prohibits disposal in landfills and incineration. To meet the EPR obligations, producers may engage themselves or authorise any other entity for collection, recycling or refurbishment of waste batteries.
- The rules will enable setting up a **mechanism and centralized online portal for exchange of EPR certificates** between producers and recyclers/refurbishers to fulfil the obligations of producers.
- The rules promote setting up of new industries and entrepreneurship in collection and recycling/refurbishment of waste batteries.
- Mandating the minimum percentage of recovery of materials from waste batteries under the rules will bring new technologies and investment in recycling and refurbishment industry and create new business opportunities.
- Prescribing the use of certain amount of recycled materials in making of new batteries will reduce the dependency on new raw materials and save natural resources.
- Online registration & reporting, auditing, and committee for monitoring the implementation of rules and to take measures required for removal of difficulties are salient features of rules for ensuring effective implementation and compliance.
- On the **principle of Polluter Pays Principle**, environmental compensation will be imposed for non-fulfilment of Extended Producer Responsibility targets, responsibilities and obligations set out in the rules. The funds collected under environmental compensation shall be utilised in collection and refurbishing or recycling of uncollected and non-recycled waste batteries.

Great Barrier Reef

Context

- The highest levels of coral cover, within the past 36 years, has been recorded in the northern and central parts of Australia's Great Barrier Reef, according to the annual long-term monitoring report by the Australian Institute of Marine Science.

About

- Australia's GBR is the world's largest reef system stretching across 2,300 km and having nearly 3,000 individual reefs.
- The new survey shows record levels of region-wide coral cover in the northern and central GBR since the first ever AIMS survey was done.
- The record levels of recovery were fuelled by increases in the **fast-growing Acropora corals**.
- However, scientists warned that these fast growing corals are also the most susceptible to environmental pressures such as rising temperatures, cyclones, pollution etc.**

What are coral reefs?

- Corals are marine invertebrates or animals which do not possess a spine. They are the largest living structures on the planet.
- Each coral is called a polyp and thousands of such polyps live together to form a colony, which grow when polyps multiply to make copies of themselves.
- Corals are of two types — hard corals and soft corals.
- Hard corals extract calcium carbonate from seawater to build hard, white coral exoskeletons. Hard corals are in a way the engineers of reef ecosystems and measuring the extent of hard coral is a widely-accepted metric for measuring the condition of coral reefs.
- Soft corals attach themselves to such skeletons and older skeletons built by their ancestors. Soft corals also add their own skeletons to the hard structure over the years. These growing multiplying structures gradually form coral reefs.
- Australia's Great Barrier Reef is the world's largest reef system stretching across 2,300 km and having nearly 3,000 individual reefs. It hosts 400 different types of coral, gives shelter to 1,500 species of fish and 4,000 types of mollusc.
- Coral reefs support over 25% of marine biodiversity even as they take up only 1% of the seafloor. The marine life supported by reefs further fuels global fishing industries.
- Besides, coral reef systems generate \$2.7 trillion in annual economic value through goods and service trade and tourism.
- In Australia, the Barrier Reef, in pre-COVID times, generated \$4.6 billion annually through tourism and employed over 60,000 people including divers and guides.

Indian Virtual Herbarium

Context

- The portal, with nearly one lakh images of specimens, recorded two lakh hits from 55 countries since its July 1 launch; site to host all of India's herbaria by 2024

Details

- With details of about one lakh plant specimens, Indian Virtual Herbarium, the biggest virtual database of flora in the country, is generating a lot of interest and turning out to be an eye-catching endeavour.
- While herbarium specimens are considered important tools for plant taxonomy, conservation, habitat loss and even climate change, **Prime Minister Narendra Modi has recently described Indian Virtual Herbarium as an example of how digital tools can help us connect to our roots.**
- Developed by scientists of the Botanical Survey of India (BSI).**
- Each record in the digital herbarium includes an image of the preserved plant specimen, scientific name, collection locality, and collection date, collector name, and barcode number.
- The digital herbarium also includes features to extract the data State-wise and users can search plants of their own States which will help them to identify regional plants and in building regional checklists
- Scientists say that there are approximately three million plant specimens in the country which are with different herbaria that are located at zonal centers of BSI and at the Central National Herbarium located at Acharya Jagadish Chandra Bose Indian Botanic Garden at Howrah in West Bengal.
- The portal provides most valuable historical collections of botanists like William Roxburgh, Nathaniel Wallich, Joseph Dalton Hooker among others who are considered founding fathers of botany in India.

- The digital herbarium has some of the oldest botanical specimens dating as early as 1696. *Cyperus procerus* was collected between 15 and 20th June, 1696, near Chennai.
- The oldest type specimen *Lepidagathis scariosa* was collected in 1817 by Robert Wight. Type specimens are those collections which help in new discoveries and are considered of great significance by botanists and taxonomists.
- The herbarium provides information on plants in different categories such as Cryptogams (spore bearing plants). Phanerogams (seed bearing plants). Both the groups are again divided into two categories which includes genera; specimen and type specimens.

Purslane Weed

Context

- A common weed – ***Portulaca oleracea***, commonly known as purslane, **offers important clues about creating drought-tolerant crops in a world beset by climate change**, noted a new study.

Details

- Purslane has the evolutionary adaptations that help it to be both highly productive and drought tolerant, an unlikely combination for a plant, said the findings of the study published in the journal Science Advances.
- Yale University scientists integrated two metabolic pathways to produce a novel type of photosynthesis that enables the weed to withstand drought while remaining highly 'productive'.
- Plants have independently evolved various mechanisms to improve photosynthesis, the process by which green plants use sunlight to synthesise nutrients from carbon dioxide and water.
- For instance, corn and sugarcane evolved C4 photosynthesis, which allows the plant to remain productive under high temperatures.
- Succulents such as cacti and agaves possess another type called CAM photosynthesis, which helps them survive in deserts and other areas with little water.
- Both C4 and CAM serve different functions but recruit the same biochemical pathway to act as 'add-ons' to regular photosynthesis, noted in the study.
- The study conducted a spatial analysis of gene expression within the leaves of purslane and found that C4 and CAM activity is totally integrated.
- They operate in the same cells, with products of CAM reactions being processed by the C4 pathway. This system provides unusual levels of protection for a C4 plant in times of drought.
- Understanding this novel metabolic pathway could help scientists devise new ways to engineer crops such as corn to help withstand prolonged drought, the authors noted.

Rock Agama

Context

- Habitat loss and other such features of urbanisation have affected the presence of the animal in urban centres.
- The study, published in Frontiers in Conservation Science, examined several environmental factors that could affect the presence of the lizard and revealed that they are found mainly in rocky places and warm spots. Thus, the inference is that conservation efforts must point towards retaining rocky patches even while reviving landscapes by planting trees.

About

- **The Peninsular Rock Agama (*Psammophilus dorsalis*) which is a type of garden lizard has a strong presence in southern India.**
- They do not generate their own body heat, so they need to seek warmth from external sources like a warm rock or a sunny spot on the wall.
- They are found in vast parts of Indian states such as **Tamil Nadu, Chhattisgarh, Kerala, Andhra Pradesh, Karnataka and Bihar.**
- **IUCN Status: Least Concern**

Megalodon

Context

- Using fossil evidence to create a three-dimensional model, **researchers have found new evidence about the life of one of the biggest predatory animals of all time – the Megalodon.**

Details

- According to the study, the Megalodon was bigger than a school bus at around 50 feet from nose to tail. In comparison, the great white sharks of the present can grow to a maximum length of around 15 feet.

- According to the new study published in the journal Science Advances, the Megalodon could “completely ingest, and in as few as five bites,” a prey as big as the killer whale.
- Using their digital model, the researchers have suggested that the giant transoceanic predator would have weighed around 70 tonnes — or as much as 10 elephants.
- Megalodons roamed the oceans an estimated 23 million to 2.6 million years ago.
- Using a previously established relationship between speed and body mass, researchers calculated that the Megalodon had an average cruising speed faster than sharks today.
- According to the research team, the Megalodon had the ability to migrate across multiple oceans.

3D modelling research

- The technique was used as the Megalodon’s skeleton is made of soft cartilage that doesn’t fossilize well.
- Using fossils that were available, including mainly teeth and a rare collection of vertebrae that has been with a Belgium museum since the 1860s, computer modelling was used to reconstruct the entire body of the extinct and largest known macropredatory shark.

Snailfish

In News

- Researchers from the American Museum of Natural History have discovered that the **Snailfish found around Greenland iceberg habitat can survive in icy Arctic waters, as they have special ‘antifreeze’ proteins in their bloodstream.**

Snailfish

- It is a small fish glowing in green and red.
- Snailfish is the **only polar fish to have biofluorescence**, this feature is rarely found in Arctic fish due to long periods of darkness in the region.
 - Biofluorescence is the ability of an organism to convert blue light into green, red, or yellow light.
- They have antifreeze proteins, which allow snailfish to prevent ice crystals from accumulating in their cells and body fluid.
 - **Antifreeze proteins are rare among sea organisms.**
 - It is important for the survival of snailfish, as fish cannot survive being partially frozen, unlike certain other reptile and insect species.

Concern

- The researchers have also raised concern that the **snailfish could be in trouble due to the melting of the Arctic ice and its warm water due to climate change,**
- **Warmer water would increase the biodiversity** in the arctic waters; it could increase competition and negatively affects the snailfish's position in the food chain.

Way Forward

- The study shows how **marine life can use its unique adaptation mechanisms to sustain in sub-zero temperatures.**

Pacific Bluefin Tuna

Context

- Concerted effort by countries like the United States, Japan, Korea, Taiwan and Mexico for decades to check overfishing has reaped results. The biomass of the Pacific Bluefin Tuna has increased and is second-highest in recorded history, showed a new stock assessment. The stock assessment report was presented at a recent plenary meeting of the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC).

About

- **The bluefin biomass, which is the parameter used to assess the stock of the fish, is set to cross the second rebuilding target later this year — much ahead of the predicted timeline.**
- It has already met the first target which was set for 2024.
- The biomass had shrunk to a sliver of its potential unfished biomass (another major assessment metric for the species) through the late 1990s and 2000s due to overfishing.
- Bluefin are the largest tunas and can live up to 40 years.
- They migrate across all oceans and can dive deeper than 3,000 feet.
- Bluefin tuna are made for speed: built like torpedoes, have retractable fins and their eyes are set flush to their body.

- They are tremendous predators from the moment they hatch, seeking out schools of fish like herring, mackerel, and even eels.
- They hunt by sight and have the sharpest vision of any bony fish.
- **There are three species of bluefin: Atlantic (the largest and most endangered), Pacific, and Southern. Most catches of the Atlantic bluefin tuna are taken from the Mediterranean Sea, which is the most important bluefin tuna fishery in the world.**
- **STATUS:** Endangered
- **SCIENTIFIC NAME:** Thunnus Thynnus
- **WEIGHT:** 1500 pounds
- **LENGTH:** 6 - 10 feet
- **HABITATS:** Oceans

Swachh Sagar Surakshit Sagar Campaign

Context

- The "International Coastal Clean Up Day" is celebrated globally on the third Saturday of September, every year. This year on 17th September 2022, the Government of India along with other voluntary organizations, and the local society will run a cleanliness campaign "Swachh Sagar, Surakshit Sagar/Clean Coast Safe Sea" along India's entire coastline.

More on the news

- Efforts will be undertaken to collect scientific data and information on Marine Litter in various matrices, such as coastal waters, sediments, biota, and beaches.
- This campaign will include Ministry of Earth Sciences (MoES), Ministry of Environment Forest and Climate Change (MoEFCC), National Service Scheme (NSS), Indian Coast Guard, National Disaster Management Authority (NDMA) along with various departments of centre and state governments, non-government organisations and educational institutions.
- This year's event also coincides with the celebrations of Azadi Ka Amrit Mahotsav in 75th year of the country's independence. **The coastal cleanup drive will be carried out at 75 beaches across the country with 75 volunteers for every kilometre of the coastline.**
- The "Swachh Sagar, Surakshit Sagar/Clean Coast Safe Sea" campaign is a 75-day citizen-led campaign for improving ocean health through collective action. The campaign started on July 3rd, 2022 and **has 3 strategic underlying goals that target transformation and environmental conservation through behavior change. The three underlying goals of the campaign are to 1. Consume Responsibly 2. Segregate waste at home and 3. Dispose Responsibly.**
- A mobile app "Eco Mitram" has been launched to spread awareness about the campaign and also for the common people for voluntary registration for the beach cleaning activity on the 17th September 2022.
- It is the first-of-its-kind and longest running coastal cleanup campaign in the world with highest number of people participating in it. Through this campaign, a mass behavioural change among the masses is intended by raising awareness about how plastic usage is destroying our marine life.

Background

- **India's coastline of more than 7,500 km** reflects our vast ocean resources. Most importantly, the Indian Ocean is the only ocean named after a country, that is, India.
- Litter especially in the form of plastics in the marine environment are a major concern and growing international problem and a number of studies have shown their harmful impact on marine biodiversity, ecosystems, fisheries, human health and economy.
- Usually, wastes from land-based sources make up the major share of marine litter.
- In this context, India, being a signatory of UN "Coastal Clean Seas" campaign, a number of activities have been adopted that have direct relevance with the "Swachh Bharat" vision and has proved highly useful.
- These initiatives are a broad approach to support efforts to prevent pollution from both land-based and offshore activities, in line with Sustainable Development Goal 14 and its target 14.1, which seeks, by 2025, to "prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution".
- Considering the dangers of plastic waste, India has implemented a nationwide ban on single-use plastic from July 01, 2022.

DISASTER MANAGEMENT

Coalition for Disaster Resilient Infrastructure (CDRI)

Context

- The Coalition for Disaster Resilient Infrastructure (CDRI) and the Government of India (GOI) signed a headquarters agreement in New Delhi. The agreement will enable the status of an 'Independent and International Legal Entity' for CDRI.

About CDRI

- The Coalition for Disaster Resilient Infrastructure (CDRI) is an international coalition of countries, United Nations (UN) agencies, multilateral development banks, the private sector, and academic institutions that aims to promote disaster-resilient infrastructure.
- Its objective is to promote research and knowledge sharing in the fields of infrastructure risk management, standards, financing, and recovery mechanisms. It was launched by India at the 2019 UN Climate Action Summit in 2019.
- CDRI's initial focus is on developing disaster-resilience in ecological, social, and economic infrastructure.
- It aims to achieve substantial changes in member countries' policy frameworks and future infrastructure investments, along with a major decrease in the economic losses suffered due to disasters.

Significance of 'Independent and International Legal Entity' status

- The pact will enable it to pursue functions internationally with all rights, immunities, and privileges, as per the United Nations (Privileges & Immunities) Act, 1947. The headquarters agreement basically gives CDRI the status of a global organization.
- This would further enable it to fulfill its commitments and engagements on the resilience of infrastructure as envisioned by India.



**PUBLIC
ADMINISTRATION**

by
Mr. Sachin Jain
Ex IRS Officer
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Why are fires raging in Himachal forests?

Himachal has witnessed almost 750 fires in April. These fires have ravaged around 5,662 hectares in the forests of Shimla, Chamba, Bilaspur, Dharamshala, Hamirpur, Kullu Mandi, Rampur, and Nahan and the Great Himalayan National Park at Shamshi in the Kullu region.

Usually, the forests are humid during April. But in 2022, the last rainfall took place in February. This led to a rain deficiency of 90-94 per cent in April against 84 per cent in the corresponding period last year. The chir pine forests were cracking dry, there is zero humidity – one spark and the entire forest caught fire.

Human negligence is also contributing to these fires. Even a cigarette butt or the act of setting dry leaves on fire can trigger a massive fire.

How vulnerable are forests in Uttarakhand and Himachal?

Out of the total forest land in Uttarakhand, 26 per cent consists of pine trees. Dry pine leaves are highly inflammable and significantly increase the fuel load.

In Himachal, of the 196 forest ranges in Himachal Pradesh, 80 are vulnerable to fires. The chir pine forests which make up 15 per cent of Himachal's forests are most prone to fires. The chir forests are spread over an area of 1258.85 sq km, which is about 3.4 per cent of the total forest area of the state.

How have other places prone to forest fires fared so far?

Apart from Himachal and Uttarakhand, Assam, Madhya Pradesh, Maharashtra, Tripura, Mizoram and Odisha report frequent forest fires annually.

Incidentally, Madhya Pradesh, Uttarakhand, Odisha – along with Chhattisgarh and Maharashtra – have been the top five states reporting a high number of large forest fires ranging between 143 to 441 between November 2021 and April 2022.

Forest Fires

What causes forest fires?

The forest fire season in India lasts from November to June. Several factors like temperatures, precipitation, vegetation, and moisture contribute to the scale and frequency of these fires.

According to the Forest Survey of India, nearly 36 per cent of India's forests are prone to frequent fires. Most forest fires are man-made due to changes in agriculture and unchecked land-use patterns.

Higher fire incidents are reported in March, April and May due to ample availability of dry biomass (fuel load) following the end of winter and the ongoing summer season.

How are forest fires classified?

Forest fires are broadly categorised into three categories – ground, surface and crown fire.

Fires that burn organic material in the soil are called ground fires, and they burn slowly, under vegetation.

Surface fires are caused largely by the burning of dry leaves, branches and other materials on the ground. Such fires spread swiftly, as in the case of fires in Himachal.

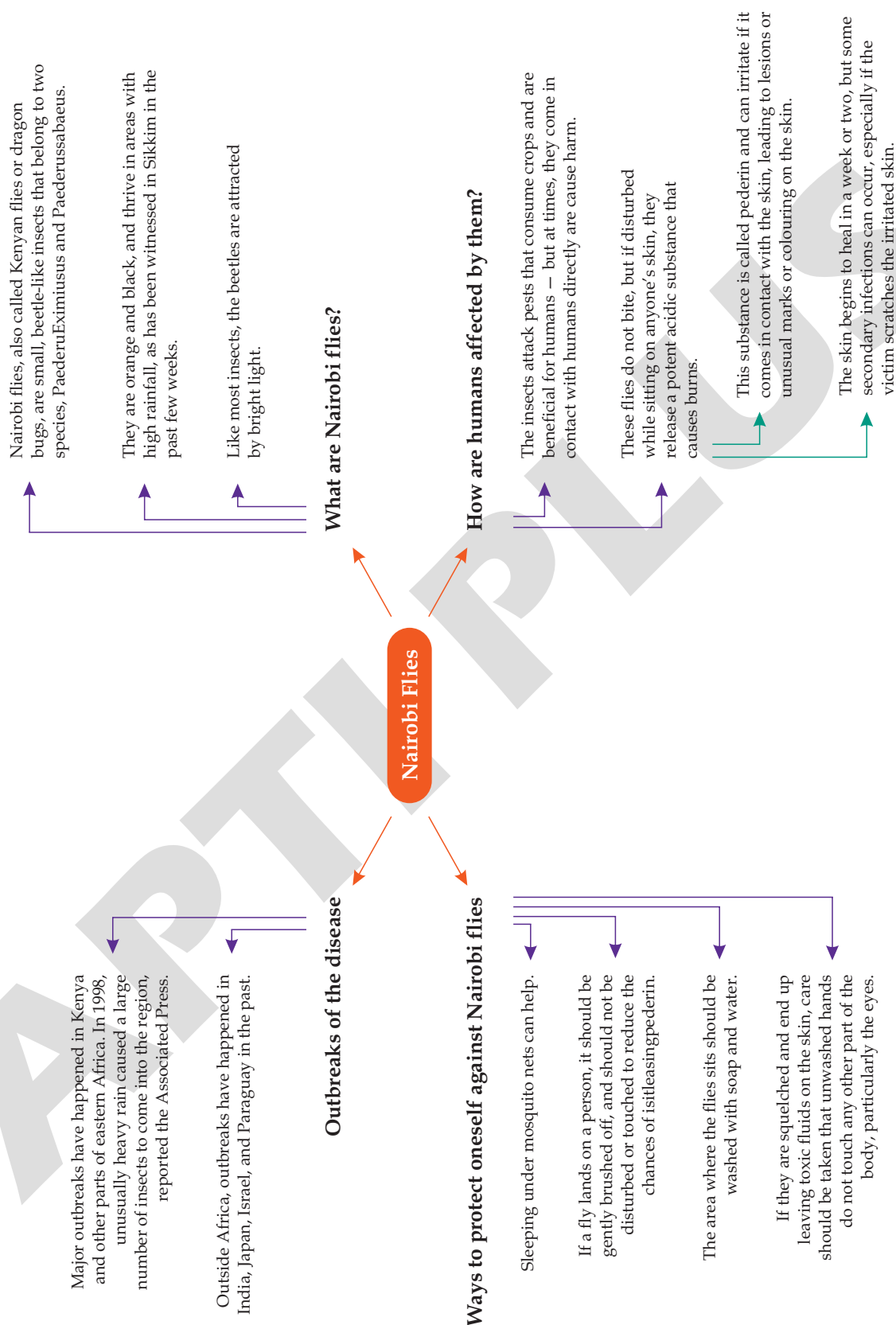
Crown fires burn quickly, from one tree top to another and have huge flames with intense heat. Such fires are rare in India.

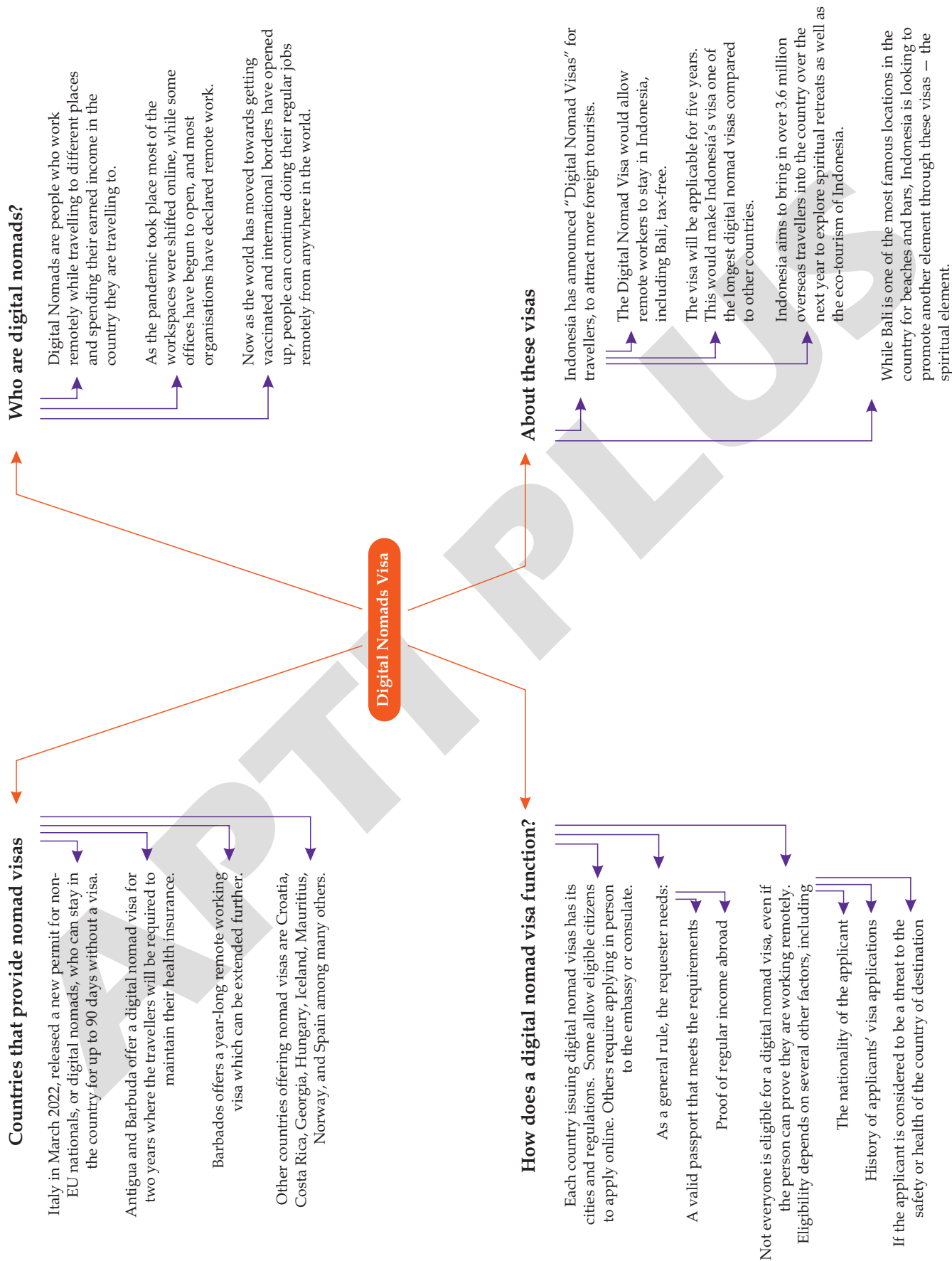
How can these fires be prevented and doused?

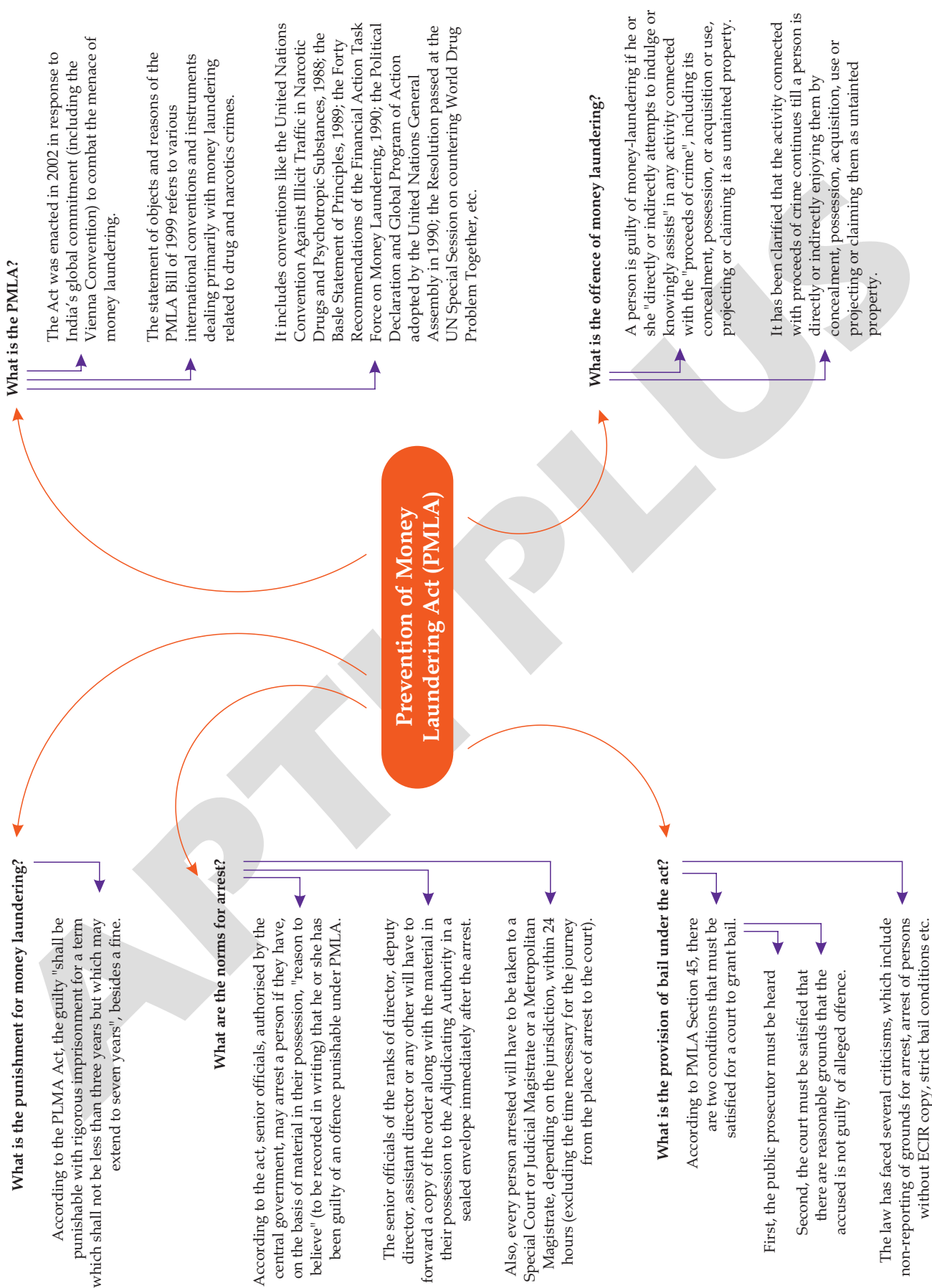
The Ministry of Environment, Forest and Climate Change lists few methods to prevent and control a forest fire:

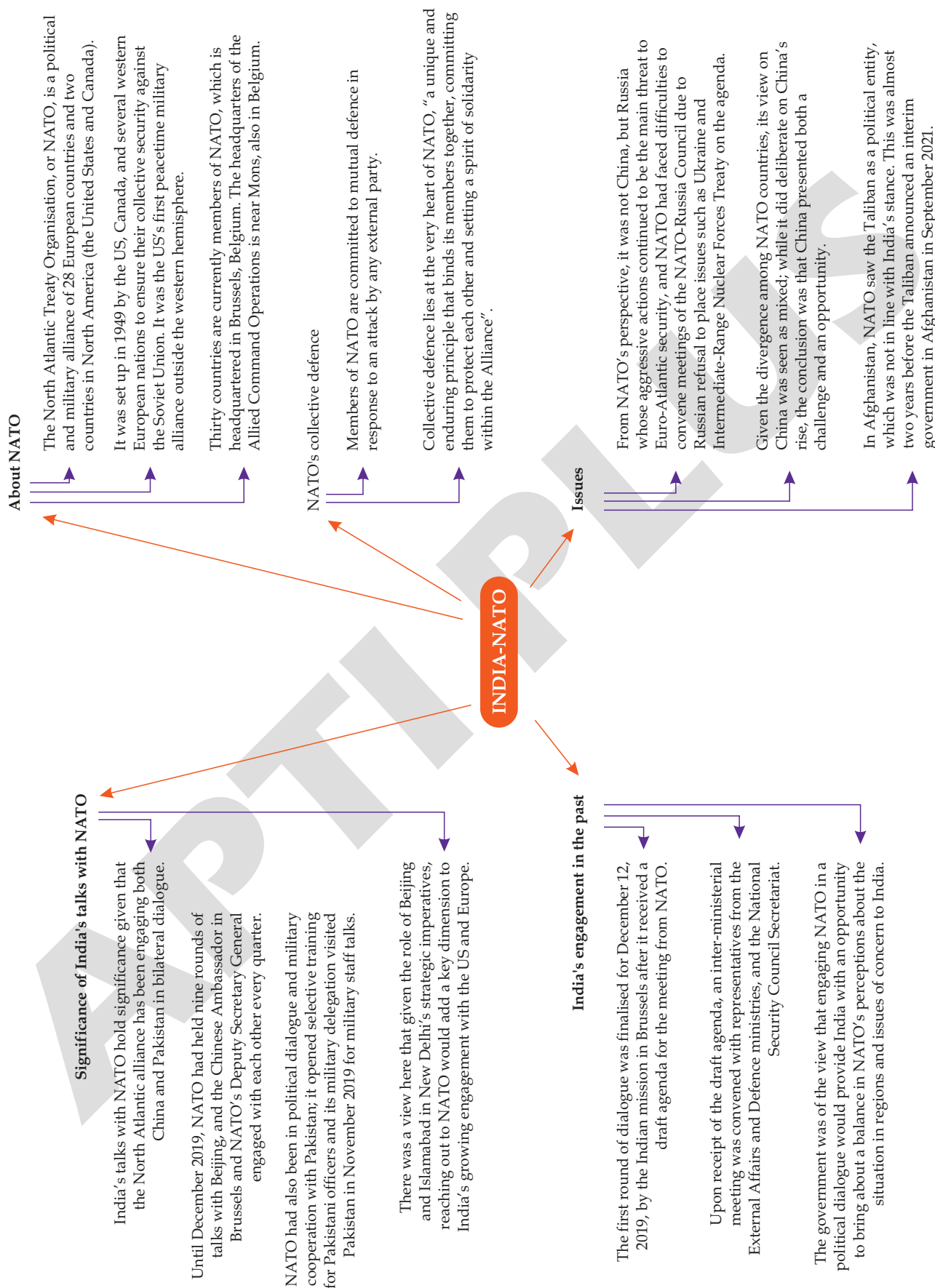
- construction of watch towers for early detection
- deployment of fire watchers
- creation and maintenance of fire lines
- involvement of local communities

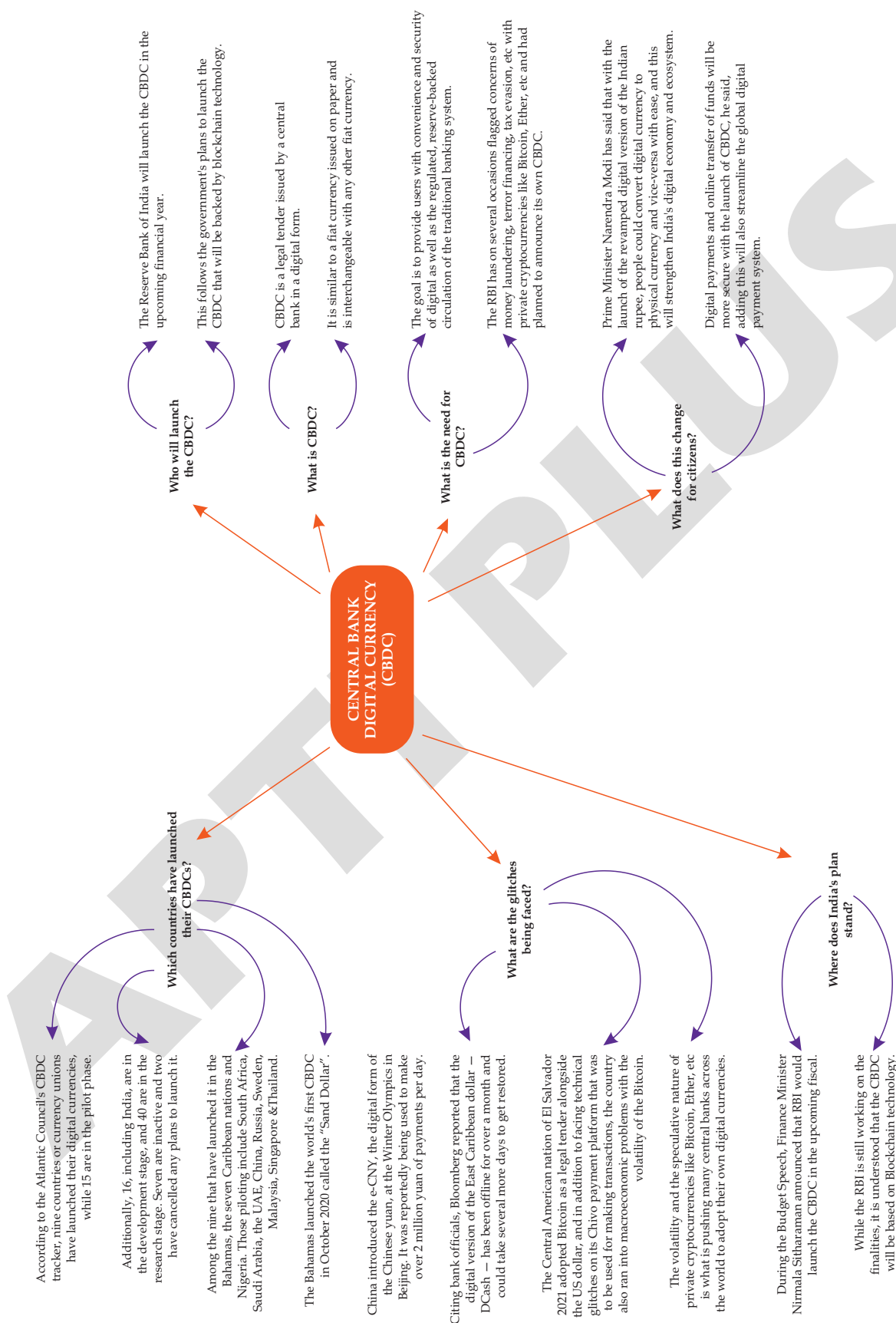
Most of the fires are being brought under control manually with the help of forest guards, labourers and volunteers.

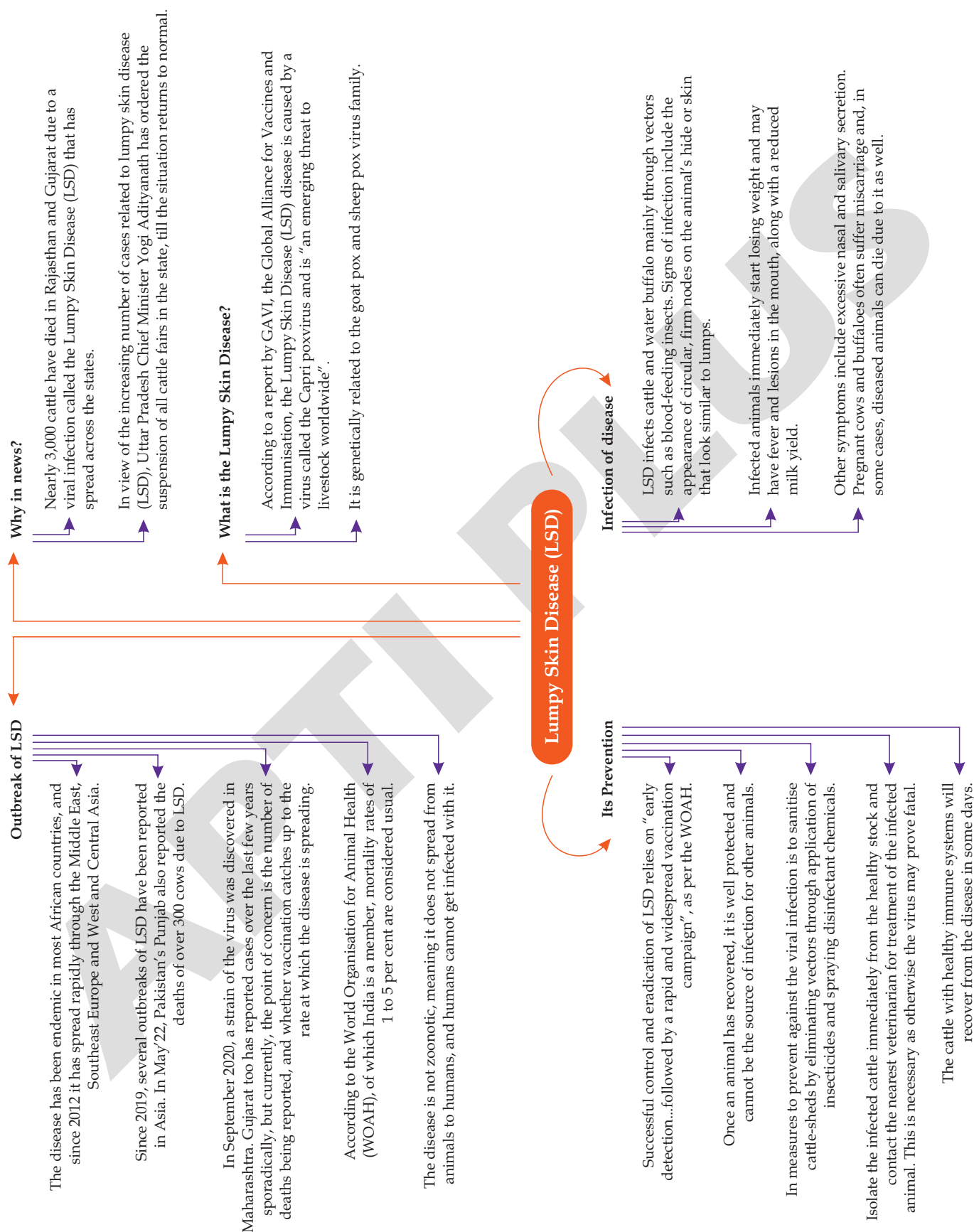












Marburg Virus Disease (MVD)

How can Marburg virus disease be diagnosed and treated?

It is difficult to clinically distinguish MVD from diseases such as malaria, typhoid fever and other viral haemorrhagic fevers.

However, it is confirmed by lab testing of samples, which like Coronavirus and Ebola are extreme biohazard risks.

There is no approved antiviral treatment or vaccine for MVD as of now. It can be managed with supportive care.

According to the WHO, rehydration with oral or intravenous fluids, and treatment of specific symptoms can help prevent death.

MVD in India

Biologists have found that bats and humans in northeast India carry antibodies to deadly viruses such as Ebola and Marburg.

An international research team, including scientists from the National Centre for Biological Sciences in Bangalore and Sastra University in Tamil Nadu, India, tested blood samples from hunted bat species and humans who hunt bats in Nagaland.

No traces of viral genetic material were detected in the bat blood or tissues. However, the researchers found virus-specific antibodies in 5.9 per cent of the human samples, 6.2 per cent of the *E. spelaea* samples and 13.3 per cent of the *R. leschenaultii* samples.

What is the Marburg Virus Disease

Marburg virus disease (MVD), earlier known as Marburg haemorrhagic fever, is a severe, often fatal hemorrhagic fever, according to the WHO.

Marburg, like Ebola, is a filovirus; and both diseases are clinically similar.

Rousettus fruit bats are considered the natural hosts for the Marburg virus. However, African green monkeys imported from Uganda were the source of the first human infection.

It was first detected in 1967 after simultaneous outbreaks in Marburg and Frankfurt in Germany; and in Belgrade, Serbia.

The disease has an average fatality rate of around 50%. However, it can be as low as 24% or as high as 88% depending on virus strain and case management.

What are the symptoms of Marburg virus disease?

After the onset of symptoms, which can begin anytime between 2 to 21 days, MVD can manifest itself in the form of high fever, muscle aches and severe headache.

Around the third day, patients report abdominal pain, vomiting, severe watery diarrhoea and cramping.

Between days 5 and 7, patients report bleeding from the nose, gums and blood appearing in vomits and faeces.

Severe blood loss leads to death, often between 8 to 9 days after symptoms begin.