Abode for Affordable Success

1ST WEEK MARCH 2023
CURRENT AFFAIRS

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General Studies I: Indian heritage & Culture

CALCUTTA TRAMS

1.Context

Kolkata's **iconic tram service celebrated 150 years** since the first tram was flagged off. The celebration saw tram enthusiasts from as far away as Germany and Australia come to the city for a historic "Tramjatra", organised by the West Bengal Transport Department

2.Background

The first trams, drawn by horses, took to Calcutta streets on February 24, 1873. Today, Kolkata remains the only city where trams are still plying. However, once upon a time, in the heyday of trams, they were a popular mode of urban transport that could be found across India, in big metropolises such as Delhi, Bombay, and Madras, as well as smaller towns such as Nasik, Patna and Bhavnagar

3.Horse-drawn Trams

- The second half of the 19th century saw rapid urban development in India, especially in the three Presidency cities of Calcutta, Bombay and Madras
- It is in this environment that the idea of tramcars emerged

- While a licence for horse drawn trams was granted in Bombay in 1865, due to multiple reasons, the project fell through
- Instead, the first trams entered service in the then British capital of Calcutta in 1873
- The horse-drawn trams plied on a 3.8 km route between Sealdah and Armenian Ghat Street
- However, by the end of the year, the service was discontinued as the venture was not economically viable
- In 1874, the first horse-drawn trams emerged in Mumbai, plying on two routes – Colaba to Pydhonie via Crawford Market, and Bori Bunder to Pydhonie
- Nasik would be the third city in India which saw trams -a four-horse-driven tram (with two cabins) that would travel a distance of around 8 km, from the present day Old Municipal Corporation building located on the Main Road to the Nashik Road railway station.
- Horse-drawn trams also debuted in Patna in 1886, with tracks stretching between Patna City (Old Patna) and Bankipore, 3 km away
- These initial tram systems were little more than horse taxis being driven on fixed lines
- They were slow and required an immense number of horses to be viable, making them difficult to succeed economically

4.Locomotives

- In 1880, trams re-emerged in Calcutta, when Lord Ripon inaugurated a new, longer, metre-gauge route between Sealdah and Armenian Ghat Street via Bowbazar Street, Dalhousie Square and Strand Road
- Two years later, The Calcutta Tramway Company would experiment with steam locomotives (instead of horses) to pull trams
- However, locomotives were never universally adopted for tram systems
- This was primarily because older locomotives were notoriously unreliable and often very polluting, drawing opposition from citizens
- Thus, by the end of the 19th century, The Calcutta Tramway Company would boast of seven locomotives and over 1000 horses, with both being used to pull trams
- The Cochin State Forest Tramway began operations in 1907, transporting teak and rosewood from the forests of Palakkad to the town of Chalakudy in Thrissur District
- At the time, this was the longest tram route in India, stretching nearly 80 km and the only one not geared towards urban transport

- In 1926, under the reign of Colonel Maharaja Raol Sir Shri Krishna Kumarsinhji Bhavsinhji, locomotive-driven tramways would be introduced in the Princely State of Bhavnagar

5.Electric Trams

- In 1895, Madras (present-day Chennai) saw India's first electric tramways enter service with seven cars
- This was a revolutionary new mode of transport, connecting the city's docks to its inland areas
- Unlike steam locomotives, these were far cleaner and less noisy, and thus immediately became a preferred option
- By 1902, Calcutta saw its first electric tramcars, plying between Esplanade and Kidderpore, and Esplanade and Kalighat
- Bombay would see electrification too, in 1907, under the newly formed Bombay Electric Supply and Tramway Company (BEST).
- Cawnpore (present-day Kanpur) saw a 6.4-km track between the railway station and Sirsiya Ghat, which became operational in 1907
- Delhi saw its first trams a year later, in the area now called Old Delhi
- In their heyday, trams could be seen in Jama Masjid, Chandni Chowk, Chawri Bazaar, Katra Badiyan, Lal Kuan, and Fatehpuri as well as Sabzi Mandi, Sadar Bazar, Paharganj, Ajmeri Gate, Bara Hindu Rao and Tis Hazari

6.Decline of Trams culture

- By the 1960s, tramways, which were once seen as a revolutionary development in urban transport, had all but vanished in India
- Today, Kolkata remains the last city which still operates trams, though these old colonial relics are perpetually at risk of being discontinued.
- Trams saw their demise due to a variety of reasons, from the emergence of better alternatives to issues with economic viability.
- Patna would be the first city to discontinue tram service in 1903, on account of low ridership.
- Nasik shut down its tramways in 1933, in the aftermath of successive years of famine and plague
- Cawnpore shut its trams down in the same year after running into insurmountable losses. Madras's tram company would go bankrupt in 1950, operating its last tram in 1953

- In Bombay, as the suburban railways extensively connected the city to its suburbs and buses took to the streets, trams quickly became obsolete
- In fact, as early as 1926, BEST actually launched its own bus service. Trams would chug on in the city till 1964
- Delhi would see trams being discontinued on account of urban congestion in 1963

7.Way forward

However, recently, trams have made their way back into public consciousness, if not in India, abroad

Melbourne operates the largest tram network in the world and plans to continue upgrading its system

One of the reasons behind this is that trams are seen as among the most sustainable modes of urban transport available

MAYAN CIVILISATION

1.Context

Mexican President Andrés Manuel Lopez Obrador (also known as AMLO) became the subject of internet jokes on Sunday (February 26) when he claimed a blurry, dark photo of a tree at night showed a figure from Mayan mythology, as depicted in a historic sculpture from the Mayan civilization.

2.About Aluxes

According to Mayan mythology, aluxes are small, mischievous creatures that inhabit forests and fields and play tricks on people, like hiding things

Shelter-like structures were built for aluxes when construction works were undertaken in the area

It was believed these shelters would attract the creatures, who would then help ward off any hindrances and help work proceed smoothly

Similarly, there are myths about angering the forest spirits

3.About Mayan Civilisation

- The larger Mayan civilisation (which reached its zenith between 300 AD to 900 AD) is recognised as one having significant cultural heft in its time with innovations in farming, stone architecture, the study of

mathematics and astronomy, devising calendars, as well as large-scale human sacrifices as part of religious rituals

- It spanned present-day Mexico, Honduras and Guatemala in Central America.
- Yucata, a peninsula in Mexico on the Gulf of Mexico, has important Mayan sites
- Mayan people, to date, continue inhabiting some of these regions
- Though the number of people speaking the indigenous languages and following traditional customs has fallen over time with Spanish colonisation or the post-Hispanic period

- As early as 1500 BCE the Maya had settled in villages and had developed an agriculture based on the cultivation of corn (maize), beans, and squash; by 600 CE cassava (sweet manioc) was also grown.
- They began to build ceremonial centres, and by 200 CE these had developed into cities containing temples, pyramids, palaces, courts for playing ball, and plazas.

- The ancient Maya quarried immense quantities of building stone (usually limestone), which they cut by using harder stones such as chert.
- They practiced mainly slash-and-burn agriculture, but they used advanced techniques of irrigation and terracing.
- They also developed a system of hieroglyphic writing and highly sophisticated calendrical and astronomical systems.
- The Maya made paper from the inner bark of wild fig trees and wrote their hieroglyphs on books made from this paper.
- Those books are called codices. The Maya also developed an elaborate and beautiful tradition of sculpture and relief carving.
- Architectural works and stone inscriptions and reliefs are the chief sources of knowledge about the early Maya.
- Early Mayan culture showed the influence of the earlier Olmec civilization.
- The rise of the Maya began about 250 CE, and what is known to archaeologists as the Classic Period of Mayan culture lasted until about 900 CE. At its height, Mayan civilization consisted of more than 40 cities, each with a population between 5,000 and 50,000.

3.1.Indigenous People

President AMLO has been known to emphasise aspects of indigenous culture Lopez Obrador(Mexican President) has often spoken about the pre-colonisation culture and blamed colonial-era abuses for present-day injustices in the country. The 1,500-kilometer Maya Train line is meant to run in a rough loop around the Yucatan Peninsula, connecting beach resorts and archaeological sites, AP reported. It has come under criticism for damage to the environment and potentially hurting the archaeological sites

MOHINIYATTAM

1. Context

Known as one of India's most inventive classical dancers and pioneering dance educationists, Mohiniyattam exponent Kanak Rele, who played a significant role in bringing a systematic structure, academic veracity and much currency to

Mohiniyattam, besides propagating female roles in Kathakali, died on February 23rd.

2. Key Points

- Mohiniattam is one of the lesser-known of the eight Indian classical dance forms the other seven being Bharatnatyam, Katahak, Kathakali, Sattriya, Oddissi, Kuchipudi and Manipuri.
- Characterised by swaying and circular movements, the dance form is very slow in comparison to the others, going up to only the second speed, Madhyama, whereas a dance form like Kathak would go up to the fourth speed, Dhuta.
- It is one of the reasons that the dance has not been very popular with audiences.
- One of the other reasons that it is not as popular is because all of the songs Mohiniattam was performed to be sung in Malayali.

3. About Mohiniyattam

- Mohiniyattam (Mohiniattam) is a classical dance form of Kerala in South India.
- The origin and popularity of this dance form are closely tagged to the great Tamil dance master Vadivelu, one of the Thanjavur quartets.
- One among the eight Indian classical dance forms, Mohiniyattam is a graceful dance to watch and is a solo recital by women.
- The term Mohiniyattam comes from the words Mohini meaning a woman who enchants onlookers and aattam meaning graceful and sensuous body movements.
- Thus, the word Mohiniyattam means dance of the enchantress.

Image source: Keralatourism.org

3.1. Hindu mythology

- Mohiniyattam has a legend attached to it as per Hindu mythology.
- It says that after the ocean of milk was churned jointly by the gods and the demons to extract the elixir of life, the demons took the divine brew by force.
- Following the incident, Lord Vishnu came to the rescue of the gods.
- He allured the demons by taking the form of a woman with outstanding beauty called Mohini and stole the elixir of life from them and handed it to the gods.
- The enticing acts of Mohini are reflected in the dance form of Mohiniyattam.
- At a time when the Devadasi tradition was prevalent in many parts of south India, Mohiniyattam used to be performed by Devadasis (temple dancers) in temples, during the rule of the Chera Kings from 9 to 12 C.E.

3.2. Evolution of Mohiniyattam

- This dance form also has elements of other performing art forms of Kerala viz. Koothu and Kutiyattam in it.
- Besides, Mohiniyattam also came under the influence of two other south Indian dance forms **Bharatanatyam and Kathakali.**

- Mohiniyattam in its early days went through ups and downs, which eventually got steadied during the reign of King Swathi Thirunal of the erstwhile Travancore kingdom.
- Apart from King Swathi Thirunal Rama Varma, Mohiniyattam received timely interventions which helped in getting its share of attention and popularity from the great Malayalam poet **Vallathol Narayana Menon** who is also the **founder of Kerala Kalamandalam** and the noted Mohiniyattam teacher, **Kalamandalam**, **Kalayanikutty Amma.**

3.3. Mohiniyattam themes, movements and mudras

- The dance form Mohiniyattam has love and devotion to God as its major themes, with usually Lord Vishnu or his incarnation Lord Krishna as the lead character.
- Mohiniyattam comprises about 40 different basic movements called adavukal and its performance style is marked by the swaying of hips and gentle movements with a straight body posture from side to side.
- This dance-like many other classical dance forms of India follows the sign language (mudra) as described in the ancient treatise on Hastha Lakshanadeepika to convey the story.
- These mudras are expressed through the fingers and palms of the hands.
- The musical accompaniment of the Mohiniyattam dance involves what is known as Chollu.
- The lyrics are in Manipravalam, which is a mixture of Sanskrit and Malayalam.
- The simple, yet elegant costume is one of the aspects that give Mohiniyattam a unique identity among classical dance forms of India.
- The attire for Mohiniyattam consists of a white sari, border with broad golden brocade (called kasavu in Malayalam).
- In Kerala, some centres offer training in Mohiniyattam.
- The Kerala Kalamandalam which is a deemed university is the premier centre in Kerala for learning classical art forms, where one can undergo training in Mohiniyattam.

KEELADI

1. Context

Keeladi is a tiny hamlet in the Sivaganga district in south Tamil Nadu. It is about 12 km southeast of Madurai's temple city and is located along the Vaigai river. The excavations here from 2015 prove that an urban civilization existed in Tamil Nadu in the Sangam age on the banks of the Vaigai river.

2. How Keeladi linked to sangam age?

- The Sangam age is a period of history in ancient Tamil Nadu that was believed to be from the third century BCE to the third century CE.
- Excavations by the Archaeological Survey of India (ASI) and Tamil Nadu State Archaeology Department (TNSDA) had pushed the Sangam age further back.
- In 2019, a TNSDA report dated the unearthed artifacts from Keeladi to a period between the sixth century BCE and the first century BCE. One of the six samples collected at a depth of 353 cm, sent for carbon dating in the U.S., dated back to 580 BCE.
- The findings in the TNSDA report placed Keeladi artifacts about 300 years earlier than the previously believed third century BCE.
- Keeladi could also provide crucial evidence for understanding the missing links of the Iron Age (12th century BCE to sixth century BCE) to the Early Historic Period (sixth century BCE to fourth century BCE) and subsequent cultural developments.

3. Links to Indus Valley Civilisation

- The unearthed Keeladi artifacts have led academics to describe the site as part of the Vaigai Valley Civilisation.
- The findings have also invited comparisons with the Indus Valley Civilisation while acknowledging the cultural gap of 1,000 years between the two places.
- Till now, the gap is filled with Iron Age material in south India, which serves as residual links. However, some of the symbols found in pot sherds of Keeladi bear a close resemblance to Indus Valley signs.
- A lot of digging and study has to be done to establish the links between these two civilizations.

Image Source: The Hindu

4. About Sangam Age

- The word ‘Sangam’ is the Tamil form of the Sanskrit word Sangha which means a group of persons or an association.
- The Tamil Sangam was an academy of poets who flourished in three different periods and in different places under the patronage of the Pandyan kings.
- The Sangam literature, largely consolidated from the third Sangam, throws information on the conditions of life of people around the beginning of the Christian era.
- It deals with the secular matter relating to public and social activities like government, war charity, trade, worship, agriculture, etc.
- Sangam literature consists of the earliest Tamil works (such as the Tolkappiyam), the ten poems (Pattupattu), the eight anthologies (Ettutogai) and the eighteen minor works (Padinenkilkanakku), and the three epics.

5. About Vaigai River

- It is an east-flowing river.
- The Vaigai river basin is an important one among the 12 basins between the Cauvery and Kanyakumari.
- This basin is bounded by the Cardamom Hills and the Palani Hills on the West and by the Palk Strait and Palk Bay on the East.

6. What has been unearthed so far?

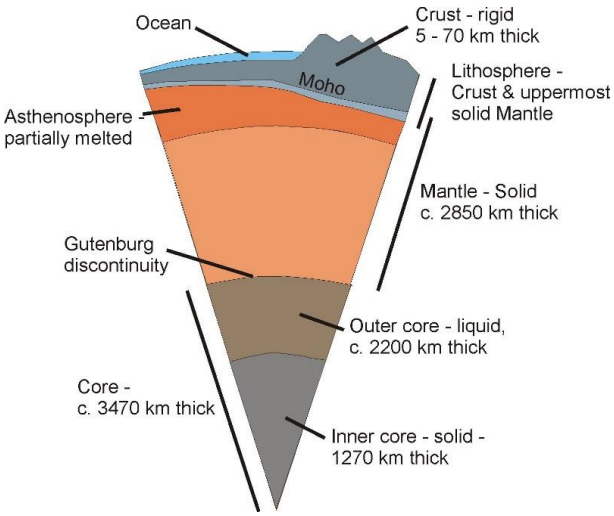
- In the eight rounds of excavations, including the first three by the ASI, over 18,000 artifacts have been unearthed from the site and the unique artifacts will be on display at the museum to the opened soon.
- The unearthing of heaps of pottery suggests the existence of a pottery-making industry, mostly made of locally available raw materials. Over 120 potsherds containing Tamil Brahmi inscriptions have been found.
- Keeladi, along with other Tamil Nadu sites which have over a thousand inscribed potsherds, clearly suggest the long survival of the script.
- Gold ornaments, copper articles, semi-precious stones, shell bangles, ivory bangles, and ivory combs reflect the artistic, culturally rich, and prosperous lifestyle of the Keeladi people.
- Agate and carnelian beads suggest import through commercial networks while terracotta and ivory dice, gamesmen, and evidence of hopscotch have been unearthed revealing their pastime hobbies.

GS I: World Geography

BOWELS OF EARTH

1. Context

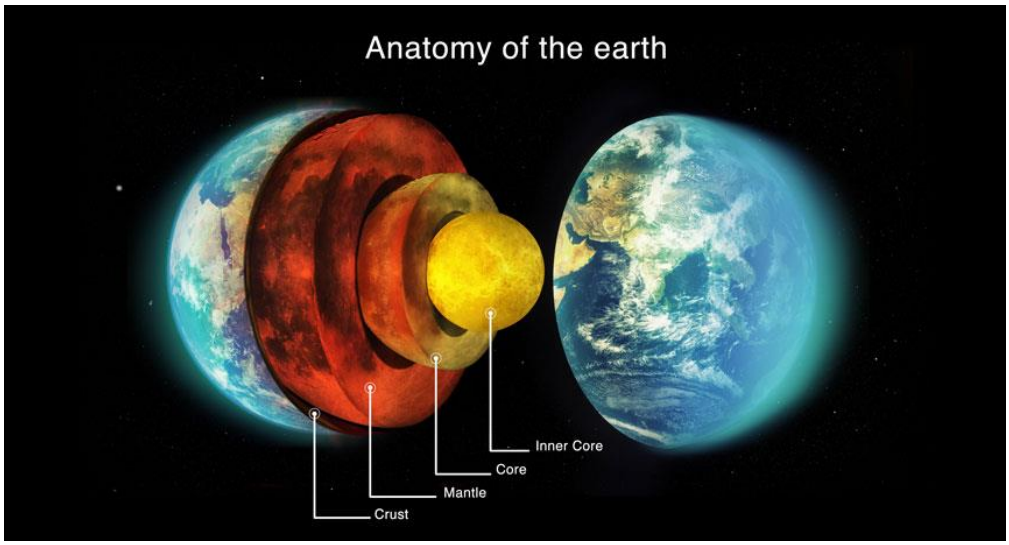
Scientists have excavated a new secret from the Earth's inner world. The researchers, in a new study, have confirmed the existence of a fifth new layer.



2.Layers of the earth

Starting at the center, Earth is composed of four distinct layers. They are, from deepest to shallowest, the inner core, the outer core, the mantle and the crust. Except for the crust, no one has ever explored these layers in person

The core is the centre of the earth and is made up of two parts: the liquid outer core and solid inner core. The outer core is made of nickel, iron and molten rock. Temperatures here can reach up to 50,000 C



2.1.Inner Core

This solid metal ball has a radius of 1,220 kilometers (758 miles), or about three-quarters that of the moon

It's located some 6,400 to 5,180 kilometers (4,000 to 3,220 miles) beneath Earth's surface

Extremely dense, it's made mostly of iron and nickel. The inner core spins a bit faster than the rest of the planet

2.2.Outer Core

This part of the core is also made from iron and nickel, just in liquid form. It sits some 5,180 to 2,880 kilometers (3,220 to 1,790 miles) below the surface.

Heated largely by the radioactive decay of the elements uranium and thorium, this liquid churns in huge, turbulent currents. That motion generates electrical currents

2.3.The Crust

This is the outside layer of the earth and is made of solid rock, mostly basalt and granite. There are two types of crust; oceanic and continental. Oceanic crust is denser and thinner and mainly composed of basalt. Continental crust is less dense, thicker, and mainly composed of granite

2.4.Mantle

The mantle lies below the crust and is up to 2900 km thick. It consists of hot, dense, iron and magnesium-rich solid rock. The crust and the upper part of the mantle make up the lithosphere, which is broken into plates, both large and small

3.Fifth Layer of the earth

The four known layers of the Earth include the crust, mantle, outer liquid and inner solid core. The fifth layer the innermost inner core lies at the Earth's centre, within the inner core

The fifth layer is made of iron and nickel, the same materials that comprise the rest of the inner core.

The difference between the two parts of the inner core could stem from how iron atoms are arranged to form a solid

The inner core as a whole was liquid in the early years of the Earth's existence, turning into a solid as the Earth cooled

Scientists rely on seismic waves — shockwaves generated during an earthquake — to 'see' the Earth's interiors

These waves behave differently as they pass through diverse materials. For example, they travel slower when they pass through hot materials.

This stems from the fact that waves from large earthquakes following a few set paths have been studied repeatedly, leaving the rest of the inner core unexplored.

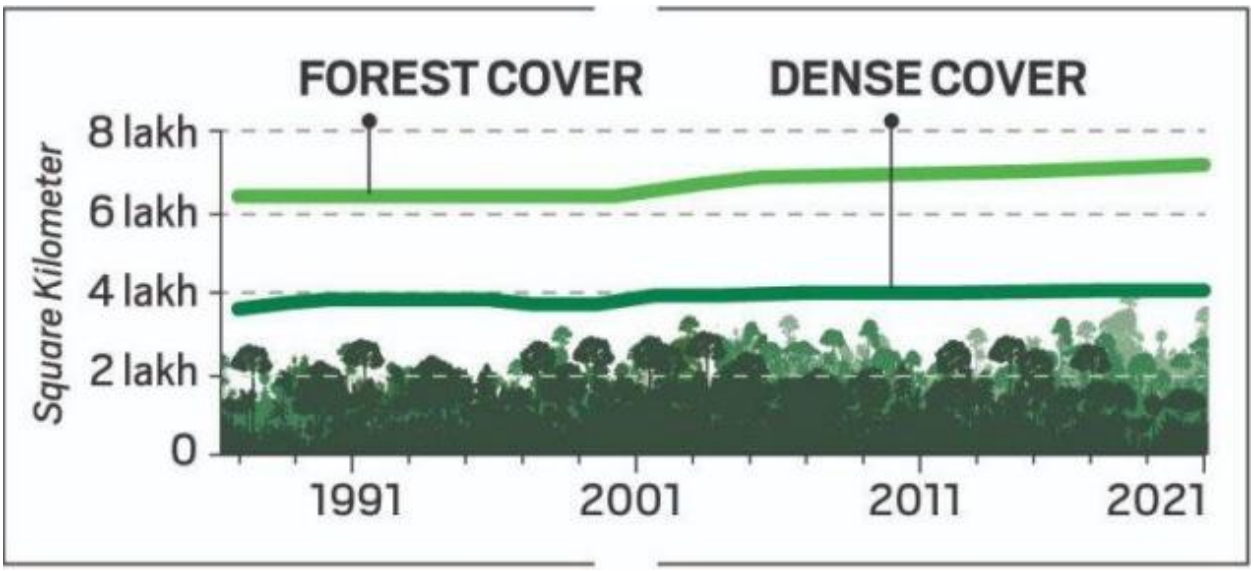
FOREST COVER DATA

1. Context

India is one of the few countries to have a scientific system of periodic forest cover assessment that provides "valuable inputs for planning, policy formulation, and evidence-based decision making". Since 19.53 % in the early 1980s, India's forest cover has increased to 21.71 % in 2021. Adding to this a notional 2.91 % tree cover estimated in 2021, the country's total green cover now stands at 24.62%, on paper.

2. Forest and Tree Cover in India

- While the Forest Survey of India (FSI) started publishing its biennial State of Forest reports in 1987, it has been mapping India's forest cover since the early 1980s.
- India counts all plots of 1 hectare or above, with at least 10% tree canopy density, irrespective of land use or ownership, within forest cover.
- This disregards the United Nation's benchmark that does not include areas predominantly under agricultural and urban land use in forests.
- All land areas with tree canopy density of 40% and above are considered dense forests and those between 10-40% are open forests.
- Since 2003, a new category-very dense forest was assigned to land with 70% or more canopy density.
- Since 2001, isolated or small patches of trees less than 1 hectare and not counted as forest are assessed for determining a notional area under tree cover by putting together the crowns of individual patches and trees.



3. National Remote Sensing Agency (NRSA) and FSI data

- The National Remote Sensing Agency (NSRA) under the Department of Space estimated India's forest cover using satellite imagery for periods 1971-1975 and 1980-1982 to report a loss of 2.79% from 16.89% to 14.10% in just seven years.
- While reliable data on encroachment is unavailable, government records show that 24,380 sq km nearly the size of Haryana of forest land was diverted for non-forest use between 1951 and 1980.
- However, the government was reluctant to accept such a massive loss and, after much negotiations, the NRSA and the newly established FSI "reconciled" India's forest cover at 19.53% in 1987.
- Significantly, the FSI did not contest the NRSA finding that the dense forest cover had fallen from 14.12% in the mid-1970s to 10.96% in 1981, and reconciled it to 10.88% in 1987.

3.1 National Remote Sensing Centre (NRSC)

- National Remote Sensing Centre (NRSC) at Hyderabad.
- It is responsible for remote sensing satellite data acquisition and processing. It is also responsible for data dissemination, aerial remote sensing and decision support for disaster management.
- National Remote Sensing Centre (NRSC) at Hyderabad has been converted into a full-fledged centre of ISRO since September 1, 2008.
- Earlier, NRSC was an autonomous body called the National Remote Sensing Agency (NRSA) under the Department of Space (DOS).

- NRSC has a data reception station at Shadnagar near Hyderabad for acquiring data from Indian remote sensing satellites as well as others.
- NRSC Ground station at Shadnagar acquires Earth Observation data from Indian remote-sensing satellites as well as from different foreign satellites. NRSC is also engaged in executing remote sensing application projects in collaboration with the users.

3.2 Forest Survey of India (FSI)

- Forest Survey of India (FSI), is a premier national organization under the Union Ministry of Environment and Forests, responsible for the assessment and monitoring of the forest resources of the country regularly.
- In addition, it is also engaged in providing the services of training, research and extension.
- Established on June 1, 1981, the Forest Survey of India succeeded the "Preinvestment Survey of Forest Resources" (PISFR), a project initiated in 1965 by the Government of India with the sponsorship of FAO and UNDP.

4. Loss of old Forest data

- In India, land recorded as forest in revenue records or proclaimed as forest under a forest law is described as a Recorded Forest Area.
- These areas were recorded as forests at some point due to the presence of forests on the land. Divided into Reserved, Protected and Unclassed forests, Recorded Forest Areas account for 23.58% of India.
- Over time, some of these Recorded Forest Areas lost forest cover due to encroachment, diversion, forest fire etc. And tree cover improved in many places outside the Recorded Forest Areas due to agro-forestry, orchards etc.
- In 2011, when the FSI furnished data on India's forest cover inside and outside the Recorded forest areas, it came to light that nearly one-third of Recorded Forest areas had no forest at all.
- Almost one-third of India's old natural forests over 2.44 lakh sq km (larger than Uttar Pradesh) or 7.43 % of India was already gone.

5. Shrinking of Natural Forests

- Even after extensive plantation by the forest department since the 1990s, dense forests within Recorded Forest Areas added up to cover only 9.96% of India in 2021.
- That is a one-tenth slide since the FSI recorded 10.88% dense forest in 1987.

- This loss remains invisible due to the inclusion of commercial plantations, orchards, village homesteads, urban housings etc as dense forests outside Recorded Forest Areas.
- The FSI provides no specific information on the share of plantations in the remaining dense forests inside Recorded Forest Areas.
- But its data offers some hints. Since 2003, nearly 20,000 sq km of dense forests have become non-forests.
- Much of that loss is compensated by nearly 11,000 sq km of non-forest areas that became dense forests in successive two-year windows since 2003.

6. Natural vs Man-made

The steady replacement of natural forests with plantations is worrisome.

- First, natural forests have evolved naturally to be diverse and, therefore, support a lot more biodiversity. Simply put, it has many different plans to sustain numerous species.
- Secondly, plantation forests have trees of the same age, are more susceptible to fire, pests and epidemics, and often act as a barrier to natural forest regeneration.
- Thirdly, natural forests are old and therefore stock a lot more carbon in their body and in the soil.
- In 2018, the United Nations Framework Convention on Climate Change (UNFCCC) flagged India's assumption that new forests (plantations) reach the carbon stock level of existing forests in just eight years.
- On the other hand, plantations can grow a lot more and faster than old natural forests. This also means that plantations can achieve additional carbon targets faster.

GLACIAL LAKES OUTBURST FLOODS (GLOF)

1.Context

Around 15 million people across the world face the risk of sudden and deadly flooding from glacial lakes, which are expanding and rising in numbers due to global warming, according to a new study. More than half of those who could be impacted live in four countries: India, Pakistan, Peru and China

2.Key takeaways

- Glacial lakes result from shrinking glaciers. Once the water is released from them, it could cause flooding in the downstream areas. This is known as glacial lake outburst floods or GLOF
- Although GLOFs have been taking place since the ice age, the risk has increased multifold due to climate change
- GLOFs can prove to be catastrophic as they mostly arrive with little warning and result in large-scale destruction of property, infrastructure, and agricultural land. They can also lead to the death of hundreds of people
- As the climate continues to warm, **glacier retreat**will form larger and more numerous lakes
- At the same time, lakes are likely to become more exposed to GLOF 'triggers', such as a large landslide or ice avalanche entering the lake, displacing water, and causing the natural dam that impounds the lake to fail
- lakes that perhaps aren't a concern at present may become a concern in the future, and entirely new and potentially dangerous lakes may form
- According to a 2020 study, the number and total area of glacial lakes worldwide have increased by about 50 per cent since 1990

3.Findings of the new study

- In order to identify the areas and communities that are most in danger from GLOFs, the researchers used existing satellite-derived data on different locations and sizes of glacial lakes with a global population model and a series of population metrics
- Moreover, the researchers also looked at levels of human development and corruption in these zones to determine how vulnerable local communities may be when floods occur
- The paper estimates that 15 million people live within the 50 km danger zone of glacial lakes
- It adds that populations in High Mountains Asia (HMA), a region stretching from the Hindu Kush all the way to the eastern Himalayas are the most exposed and on average live closest to glacial lakes with around one million people living within 10 km of a glacial lake
- India and Pakistan make up one-third of the total number of people globally exposed to GLOFs around three million people in India and around two million people in Pakistan
- Another interesting finding of the study is that the glacial flood risks don't only depend on the size and number of glacial lakes in an area

- Number of people living in the area, their proximity to the danger zone as well as the levels of social vulnerability
- For instance, areas like Greenland and Canada, which have a large number of glacial lakes, have very few people who are vulnerable to GLOFs as their population and corruption levels are low
- While the number and size of glacial lakes in these areas (India and Pakistan) isn't as large as in places like the Pacific Northwest or Tibet, it's that extremely large population and the fact that they are highly vulnerable that means Pakistan and India have some of the highest GLOF danger globally
- The most dangerous catchment in the world in according to study is Khyber Pakhtunkhwa in Pakistan
- However, the most surprising bit for the scientists was to find Peru ranking third globally in danger levels
- They point out that in the past two decades, due to climate change, glacial lakes across the Andes have increased by 93 per cent, in comparison to 37 per cent in high-mountain Asia

4.About GLOF

- Glacial lakes are large bodies of water that sit in front of, on top of, or beneath a melting glacier
- As they grow larger in size, they become more dangerous because glacial lakes are mostly dammed by unstable ice or sediment composed of loose rock and debris
- In case the boundary around them breaks, huge amounts of water rush down the side of the mountains, which could cause flooding in the downstream areas. This is called glacial lake outburst floods or GLOF
- These lakes are also often found in steep, mountainous regions, which means landslides or ice avalanches can sometimes fall directly into the lakes and displace the water, causing it to over-top the natural dam and flood downstream
- In 2013, one such event took place in Uttarakhand's Kedarnath when the region witnessed flash floods along with a GLOF caused by the Chorabari Tal glacial lake, killing thousands of people

HEATWAVE

1. Context

Last week, the India Meteorological Department (IMD) warned that the maximum temperatures over northwest, west, and central India would be 35°C higher than the longterm average. On February 21, the national capital recorded its third hottest February day (33.6° C) in more than five decades.

2. What is a Heat Wave?

- A heatwave is a period of abnormally high temperatures, a common phenomenon in India during the months of May-June and in some rare cases even extends till July.
- Indian Meteorological Department (IMD) classifies heat waves according to regions and temperature ranges. As per IMD, the number of heatwave days in India has increased from 413 over 1981-1990 to 600 over 2011-2020.
- This sharp rise in the number of heatwave days has resulted due to the increasing impact of climate change.
- The last three years have been La Niña years, which has served as a precursor to 2023 likely being an El Niño year. (The El Niño is a complementary phenomenon in which warmer water spreads westeast across the equatorial Pacific Ocean.)
- As we eagerly await the likely birth of an El Niño this year, we have already had a heat wave occur over northwest India.
- Heat waves tend to be confined to north and northwest India in El Niño years.

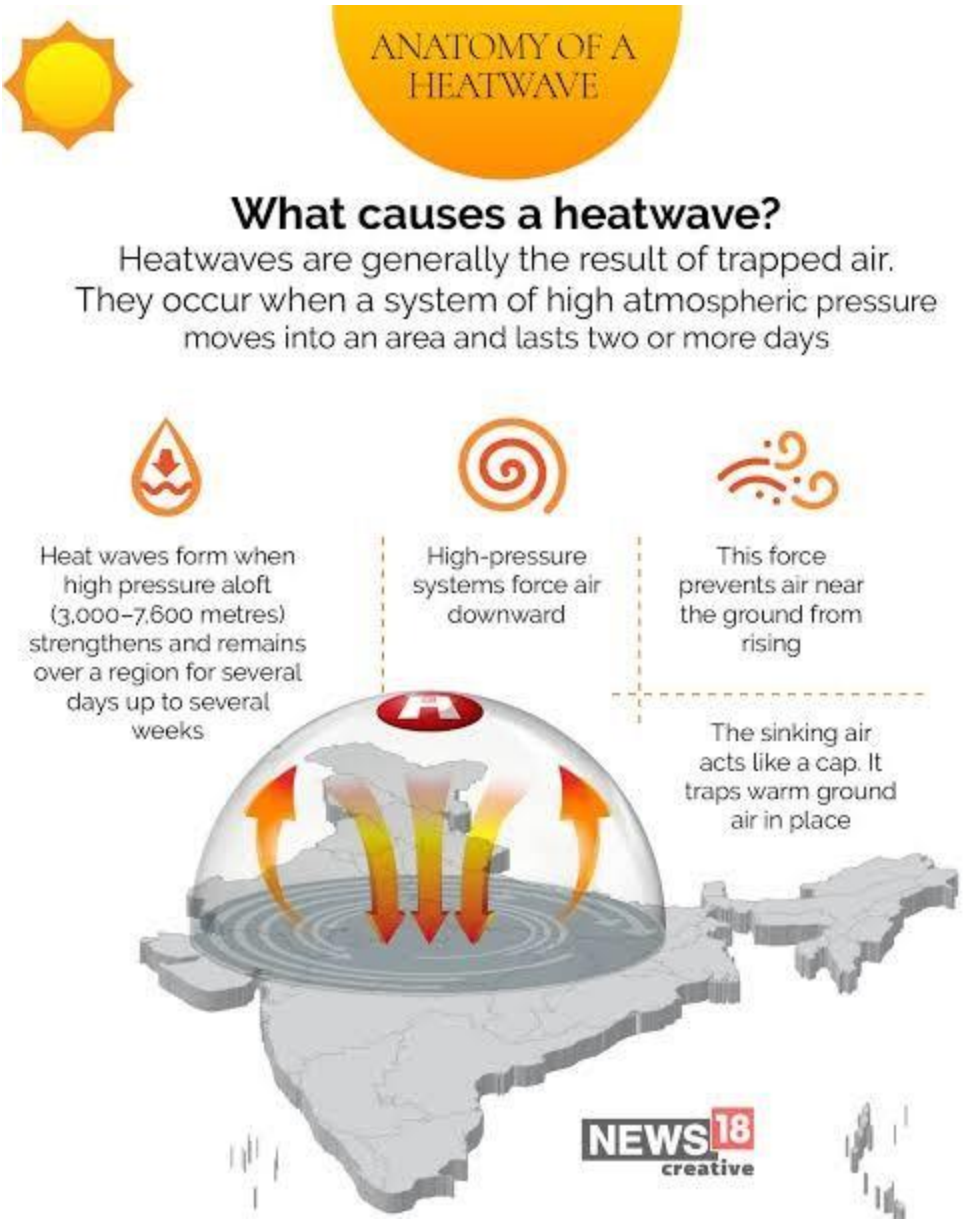


Image Source:News18

3. How do Heat waves Occur?

- Heat waves are formed for one of two reasons warmer air is flowing in from elsewhere or it is being produced locally.
- It is a local phenomenon when the air is warmed by higher land surface temperature or because the air sinking down from above is compressed along the way, producing hot air near the surface.

- First of all, in spring, India typically has air flowing in from the west-northwest. This direction of airflow is bad news for India for several reasons.
- Likewise, air flowing in from the northwest rolls in over the mountains of Afghanistan and Pakistan, so some of the compression also happens on the leeward side of these mountains, entering India with a bristling warmth.
- While air flowing over the oceans is expected to bring cooler air, the Arabian Sea is warming faster than most other ocean regions.
- Next, the strong upper atmospheric westerly winds, from the Atlantic Ocean to India during spring, control the near-surface winds.
- Any time winds flow from the west to the east, we need to remember that the winds are blowing faster than the planet which also rotates from west to east.
- The energy to run past the earth near the surface, against surface friction, can only come from above. This descending air compresses and warms up to generate some heat waves.

4. Impacts of heat waves in India

- The frequent occurrence of heat waves also adversely affects different sectors of the economy.
- For instance, the livelihood of poor and marginal farmers is negatively impacted due to the loss of working days.
- Heatwaves also have an adverse impact on daily wage workers' productivity, impacting the economy.
- Crop yields suffer when temperatures exceed the ideal range.
- Farmers in Haryana, Punjab, and Uttar Pradesh have reported losses in their wheat crop in the past rabi season. Across India, wheat production could be down 6-7% due to heat waves.
- Mortality due to heat waves occurs because of rising temperatures, lack of public awareness programs, and inadequate long-term mitigation measures.
- According to a 2019 report by the Tata Center for Development and the University of Chicago, by 2100 annually, more than 1.5 million people will be likely to die due to extreme heat caused by climate change.
- The increased heat wave will lead to an increase in diseases like diabetes, circulatory and respiratory conditions, as well as mental health challenges.
- The concurrence of heat and drought events is causing crop production losses and tree mortality. The risks to health and food production will be made more severe by the sudden food production losses exacerbated by heat-induced labor productivity losses.

These interacting impacts will increase food prices, reduce household incomes, and lead to malnutrition and climate-related deaths, especially in tropical regions.

5. How does air mass contribute to heat waves?

- The other factors that affect the formation of heat waves are the age of the air mass and how far it has traveled.
- The north northwestern heatwaves are typically formed with air masses that come from 800-1600 km away and are around two days old.
- Heat waves over peninsular India on the other hand, arrive from the oceans, which are closer (around 200-400km) and are barely a day old. As a result, they are on average less intense.

6. Way ahead for Heat waves

- Identifying heat hot spots through appropriate tracking of meteorological data and promoting timely development and implementation of local Heat Action Plans with strategic inter-agency coordination, and a response that targets the most vulnerable groups.
- Review existing occupational health standards, labor laws, and sectoral regulations for worker safety in relation to climatic conditions.
- Policy intervention and coordination across three sectors health, water, and power are necessary.
- Promotion of traditional adaptation practices, such as staying indoors and wearing comfortable clothes.
- Popularisation of simple design features such as shaded windows, underground water storage tanks, and insulating house materials.
- Advance implementation of local Heat Action Plans, plus effective inter-agency coordination is a vital response that the government can deploy in order to protect vulnerable groups.

EL-NINO

1. Context

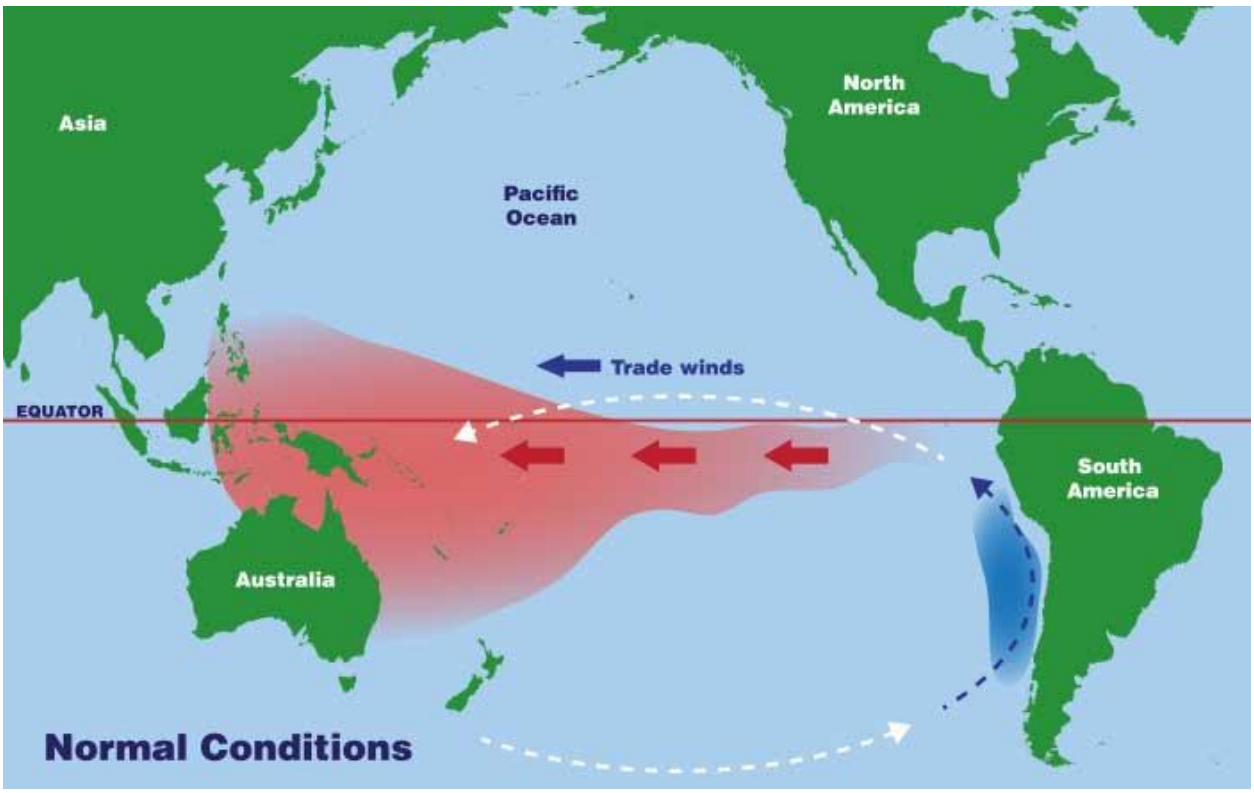
India is experiencing a colder-than-normal winter thanks to the north-south winter flow set up by the weather phenomenon known as La Nina.

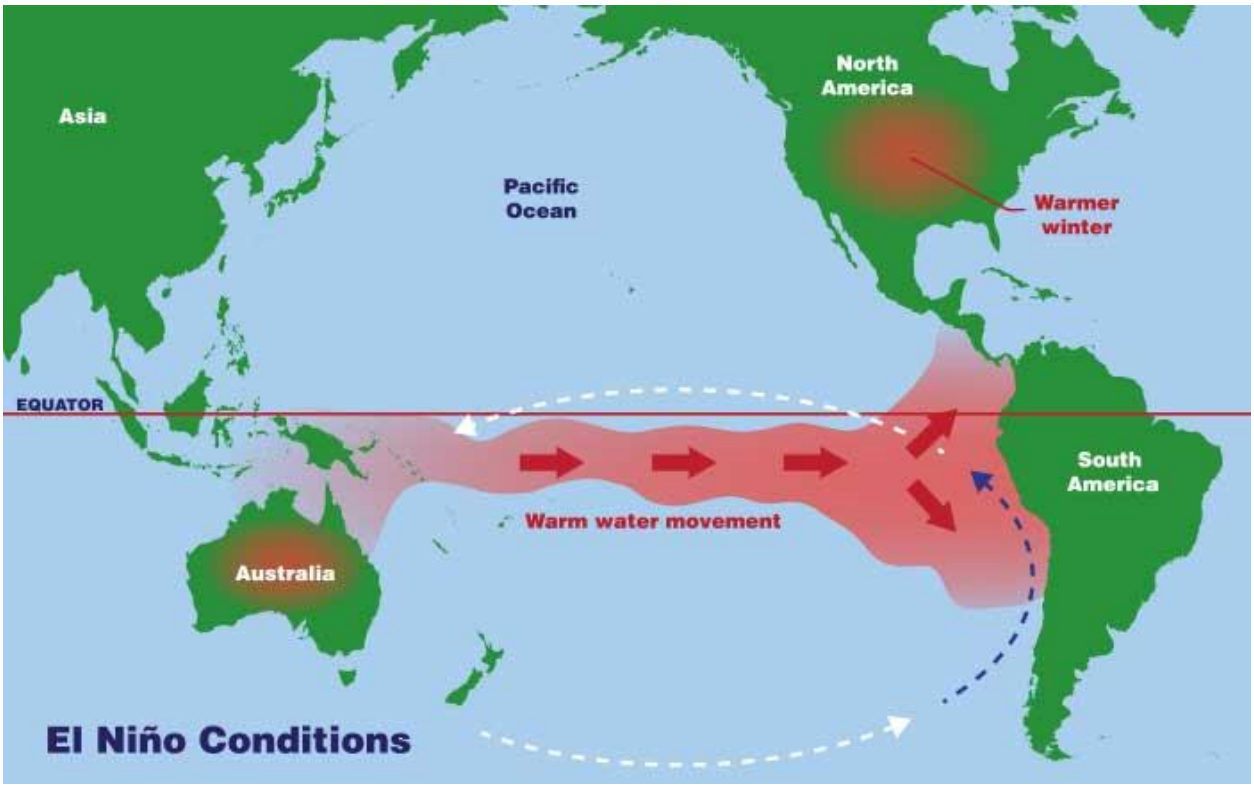
2. Key points

- La Nina itself is going on for a record-breaking third consecutive year.
- Now, forecasts for the 2023 fall and winter are predicting that its companion phenomenon the El Nino will occur with more than a 50 per cent probability.

3. About El Nino and La Nino

- El Nino refers to a band of warmer water spreading from west to east in the equatorial Pacific Ocean.
- Years in which an El Nino occurs are simply called "El Nino years and global weather patterns in that year tend to be anomalous in certain ways.
- Similarly, a La Nina occurs when the band of water spreads east-west and is cooler.
- Both phenomena affect the weather worldwide and can have drastic effects on economies that depend on rainfall.
- Together, El Nino and La Nina make up a cyclical process called the El Nino Southern Oscillation (ENSO).





Images Source: Sci Jinks

4. El Nino and La Nina forecasts

- The first thing to note is that El Nino forecasts before spring tend to be notoriously unreliable due to a so-called **spring predictability barrier**.
- The climate system is quite noisy in spring as the Sun transitions across the equator from one hemisphere to the other. This complicates El Nino's predictions before the spring.
- Second and perhaps more importantly, in a La Nina year, the tropical Pacific Ocean soaks up heat like a sponge and builds up its volume of warm water.
- During El Nino, this warm water spills from the western part of the Pacific Ocean to the eastern part.
- But the earth has had three straight La Nina years, which means the Pacific's warm-water volume is fully loaded and is likely to birth an El Nino soon.
- An El Nino year creates a global-warming crisis in miniature, since the warm water spreading across the tropical Pacific releases a large amount of heat into the atmosphere.

An El Nino this year could increase the plant's average surface temperature by

more than 1.5° C from pre-industrial levels (a.k.a. the threshold of the **Paris Agreement**).

- Again, it is not clear if this transient spike will produce anything more dramatic beyond the extremes we are already experiencing.
- An El Nino will of course bring its usual global perturbations, including cyclones and the monsoon.

5. Effects on the northern Indian Ocean

- A transition from a La Nina winter which we are in currently to an El Nino summer has historically tended to produce the largest deficit in the monsoon, on the order of 15 per cent.
- This means that pre-monsoon and monsoon circulations tend to be weaker in an El Nino Year.
- The vertical shear (change in the intensity of winds from the surface to the upper atmosphere) tends to be weaker as well.
- This in turn can favour enhanced cyclogenesis i.e. cyclone formation.
- Of course, the global climate system is not so simple. Intraseasonal or sub-seasonal timescale variability in sea-surface temperature and winds is also very important for cyclogenesis over the northern Indian Ocean.
- These timescales denote the durations for which certain temperature and wind characteristics persist in the pre and post-monsoon periods.
- This said the net effect is for cyclogenesis to be subdued in an El Nino year.
- Again, we will have to wait until spring to get a sense of how the cyclone season will play out this year.

6. Monsoons

- As for the monsoon itself: if an El Nino state does emerge by summer, we will likelier than not have a deficit monsoon in 2023.
- Some research has indicated that the Indian Ocean diploe seesawing of sea-surface temperature over the western Indian Ocean could compensate for the negative effects of an El Nino.
- But it is not yet clear whether there is a robust relation between the dipole, El Nino and the summer monsoon. We also do not know if the dipole will evolve the "right" way this year.
- As has been the case in recent decades, a monsoon deficit itself will be accompanied by a smorgasbord of both wet and dry extreme events.

- A weaker monsoon circulation will produce a severe deficit over much of India.
- And while the overall seasonal total could be deficient, there are likely to be isolated pockets of heavy or very heavy rainfall. It's complicated the monsoon version.
- Then there are the monsoon's vagaries themselves. For example, pre-monsoon cyclones are susceptible to warming in the Arctic region and could in turn affect the onset of the summer monsoon.
- Indeed, the summer monsoon system is quite complicated: its various components are affected by a plethora of meteorological events both local and global. Even details at the intraseasonal scale can have an effect.
- For example, the Bay of Bengal has of late been receiving freshwater from heavy rains as well as anomalously high river runoffs.
- These waters tend to sneak into the Arabian Sea and produce surface warming and the build-up of subsurface heat.
- These changes together may create favourable conditions for the formation of bigger and worse cyclones, especially if the circulation and the vertical shear are weaker as well.
- In all, India will have to wait for the El Nino forecast to be updated in the coming weeks.
- It will also have to hope for the best and unavoidably, prepare for the worst.
- Apart from preparedness, an unfavourable prediction will also test the India Meteorological Department's suite of forecast products and efforts to translate its forecasts into usable advisories for fishing, farming, flood alerts, etc.

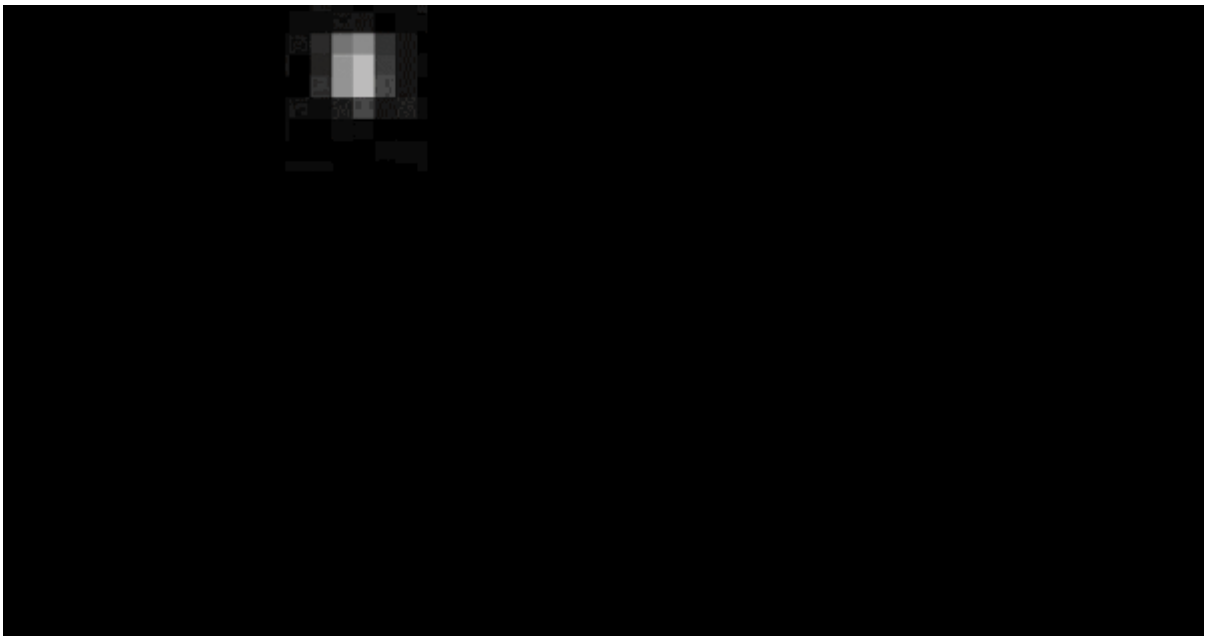
CONTROVERSIAL STORY OF PLUTO

1.Context

Pluto has been discovered on February 18, 1930
The search for Pluto was paused for fourteen years post Lowell's passing in 1915, resumed by a 23-year-old astronomer named Clyde W Tombaugh in 1929 at the Lowell Observatory.

2.About Pluto

- According to the International Astronomical Union (IAU), our solar system officially has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. But between 1930 to 2006, it had nine. No, a planet did not simply disappear.
- In 1906, Percival Lowell, a wealthy businessman, started an extensive project in search of a possible ninth planet, – "Planet X."
- The existence of a ninth planet had been theorised by scientists in the late 19th century while observing perturbations in the orbit of Uranus
- Astronomers had speculated that some planet, other than Neptune, was behind observed disturbances in Uranus's orbit
- Tombaugh systematically imaged the night sky in pairs of photographs taken two weeks apart
- Then, using a blink comparator, he rapidly shifted back and forth between views of each of the plates to create the illusion of movement of any objects that had changed position or appearance between photographs
- After a year of searching, on February 18, 1930, Tombaugh discovered a possible moving object on his photographic plates
- After confirmatory photographs were obtained, the news of the discovery was telegraphed to the Harvard Observatory
- According to researchers today, there are 16 known pre-discoveries of the planet, with the oldest dating as far back as 1909



Source: NASA

3.Controversy

- The discovery of a new planet made headlines across the world with the Lowell Observatory receiving 1000s of letters suggesting possible names
- After much deliberation, Pluto was chosen after the Roman God of the underworld
- The name was suggested by Venetia Burney, an 11-year-old schoolgirl from Oxford, England who was fascinated with classical mythology
- But while the general public was excited by the discovery of a ninth planet, the first since Neptune was discovered in 1846, doubts started being raised whether Pluto was indeed Lowell's "Planet X"
- Crucially, Pluto was tiny compared to what was originally predicted, definitely not large enough to cause the observed disturbances in Uranus's orbit.
- That along with the fact that it was more than six times dimmer than what Lowell had predicted, meant that ever since its discovery, scientists questioned Pluto's status as a planet
- Throughout the mid-20th century, estimates of Pluto's mass were revised downward
- From being considered to be nearly the size of the Earth in 1931, by 1949 Pluto's size was pegged to be somewhere between Mercury and Mars with its mass being roughly a tenth of that of Earth
- In 1978, Pluto's size was finally determined conclusively it was one five-hundredth that of Earth or one-sixth that of the Moon, too small to be Lowell's predicted "Planet X"

4.Status of a Planet

- Pluto's status as a planet really fell into jeopardy from 1992 onwards, when the Kuiper Belt was discovered
- A circumstellar disc in the outer solar system, the Kuiper Belt contains over 100,000 discovered small objects (diameter over 100km), all revolving around the sun beyond the orbit of Neptune
- As more KBOs were discovered, Pluto's uniqueness as a celestial object quickly diminished
- In 2005, astronomers at Caltech announced the discovery of a new trans-Neptunian object, Eris, which was substantially more massive than Pluto
- While some clamoured for it to be called the tenth planet of the solar system, others saw it as the strongest argument for the reclassification of Pluto

- Finally, in 2006, the IAU came up with a resolution that created an official definition of a "planet"

The resolution outlined three criteria that a planet must meet in order to be so classified:

1.The object must be in orbit around the sun
2.The object must be big enough to be rounded by its own gravity, and
3.The object must have cleared the neighbourhood around its orbit
Pluto failed to meet the third criterion

- Pluto is not gravitationally dominant – its mass is substantially less than the combined mass of the other objects in its orbit (0.07 times, in contrast to Earth, which is 1.7 million times the remaining mass in its orbit, excluding the moon)
- For celestial objects that satisfy the first two criteria but not the third, the IAU came with the classification of "**dwarf planet**"

On July 14, 2015, NASA's New Horizons spacecraft made its historic flight through the Pluto system – providing the first close-up images of Pluto and its moons and collecting other data that has transformed our understanding of these mysterious worlds on the solar system's outer frontier

GS II: International relations

PORCUPINE STRATEGY

1. 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.

2. The Porcupine Doctrine

- The Porcupine doctrine was proposed in 2008 by US Naval War College research professor William S Murray.

- It is a strategy of asymmetric warfare focused on fortifying a weak state's defenses to exploit the enemy's weaknesses rather than taking on its strengths.
- It is about building defenses that would ensure that Taiwan could be attacked and damaged but not defeated, at least without unacceptably high costs and risks.

3. How does this doctrine work?

- There are three defensive layers in the Porcupine approach.
- The outer layer is about intelligence and reconnaissance to ensure defense forces are fully prepared. Behind this come plans for guerrilla warfare at sea with aerial support from sophisticated aircraft provided by the US.
- The innermost layer relies on the geography and demography of the island.
- 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".

Image Source: BBC

4. Asymmetric system 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".

- These asymmetric capabilities will be aimed at striking the "operational center of gravity and key nodes of the enemy", it said.
- The geographic advantages of the Taiwan Strait shall be tapped to shape favorable conditions for us to disrupt the operational tempo of the enemy, and frustrate its attempts and moves of invasion at decisive points to strike a dispread enemy with a united blow.

5. Need for such a strategy

- China enjoys overwhelming military superiority over Taiwan.
- Over the past decade, Beijing has developed more accurate and precise weapon systems to target Taiwan.
- China has been more vocal about its intention to "reunite" the island with the mainland by force or coercion if needed.
- The PLA has already achieved the capabilities needed to conduct an air and naval blockade, cyberattacks, and missile strikes against Taiwan.
- PLA leaders now likely assess they have, or will soon have, the initial capability needed to conduct a high-risk invasion of Taiwan (following Russia's Path).

6. One China Policy

- One China is a longstanding US policy that forms the bedrock of its relationship with Beijing.
- Under the policy, the US snapped formal diplomatic ties with the Republic of China (ROC) in Taiwan and established ties with the People's Republic of China (PRC) in Beijing in 1979.
- The One China policy is a key cornerstone of Sino-US relations.
- The One-China policy recognizes only the People's Republic of China.
- It states that there is only one sovereign state under the name China with the PRC serving as the sole legitimate government of that China.
- The policy opposes two states holding the same name 'China' and the idea that China and Taiwan form two separate countries.
- The policy does not recognize the existence of Taiwan.
- Any country that wants diplomatic relations with mainland China must break official ties with Taipei. This has resulted in the diplomatic isolation of Taiwan from the international community.

7. How easy will it be for China?

- Missile strikes, cyberattacks, and air and naval blockades 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.
- The PLA is estimated to have air and naval resources to carry out an initial landing of 25,000 or more troops, which could increase if it deploys civilian ships to meet its military objectives.
- However, it will have to first select and secure a suitable beachhead from among the handful that is available.
- Also, with small and agile weapons systems, Taiwan can turn its coastline into a kill zone that would deny China a walkover.
- Beijing would have to rely on cyberattacks, missile strikes on Taiwan's air bases and runways, and a blockade to choke it into surrendering.

MYANMAR TEAK

1. Context

Myanmar and India who say the conflict on the ground and frequent change of regulations by Myanmarese authorities pose twin challenges.

2. Myanmar Teak

- Teak from Myanmar's deciduous and evergreen forests is considered the most tensile and durable hardwood, resistant to water and termites.
- This prized wood is in demand for high-end furniture, veneer, and ship decking much sought after by the luxury yacht industry.
- Adding to its value, ironically, is Myanmar's shrinking forest cover and depleting teak reserves.
- Global Forest Watch says the country, over the last two decades, has lost forest cover roughly the size of Switzerland.

3. Why is teak imported from Myanmar described as “conflict wood”?

- Since the February 2021 coup in Myanmar when the democratically elected government was overthrown, the military junta has also taken control of Myanma Timber Enterprises (MTE), the state-owned company which has exclusive rights over the country’s precious timber and teak trade.

- The MTE has held an estimated dozen timber auctions since the coup and sales of this “conflict” wood, pro-democracy supporters allege, are a key revenue stream for the military regime.

4. Steps were taken to check the illegal harvesting of timber and teak from Myanmar

- In 2013, the European Union introduced the EU Timber Regulation (EUTR), which put the onus on timber merchants to do sufficient due diligence to disallow illegal timber from entering their markets.
- A year later, Myanmar itself banned the export of whole logs-the same year international NGO Environmental Investigation Agency (EIA) released data that showed that over 70% of the logs exported from Myanmar between 2000-2013 were illegally harvested.

Conflict Wood

Under sanctions, prized Myanmar teak finds its way to the US, and EU markets via India.

Finally, months after the February 2021 military coup, both the EU and the US imposed sanctions on all timber trade with Myanmar and categorized MTE as a banned entity.

5. Impact of the sanctions

- The EU consensus has been that since due diligence is not possible for all Myanmar timber and teak, any imports from Myanmar are a violation of the law.
- Also, as Forest trends have analyzed in its March 2022 report, since all MTE auctions are held in US currency, regardless of the nationality of the traders and imports from Myanmar should again be considered a violation.
- Despite this, the flow of teak originating from Myanmar continues into the US and several EU countries, as borne out by global trade data.
- Ans although direct trade into countries like Germany, Belgium, and Netherlands has come down to negligible quantities, imports into countries like Italy, Croatia, and Greece have increased.
- Plus, there have been numerous seizures of smuggled teak along Myanmar's borders of China and India, traditionally the largest importers of its teak.

6. What are the loopholes to be plugged to ensure that India is not looked upon as a leakage country?

- On the question of continuing exports (as evident from trade data) from Myanmar to countries where sanctions are in place, timber traders said their buyers were free to do DNA testing on the hardwood for traceability of origins.
- However, this science is a nascent one even in the developed world and has not been introduced in India either by timber traders or by police forces, for instance, as evidence against smugglers who are frequently caught along the Indo-Myanmar border with stolen truck consignments.
- The Indian Express noticed clear loopholes in regulations while teak was being exported to EU countries, which the trader's claim was paid for before the 2021 coup.
- Trade data reveals some Indian companies simply put "Asia" in the column for the origin of the wood, without specifying which country.
- Also, forest officials in Nagpur said that in transit passes they signed, traders wrote"imported" in the space for declaring where the teak was purchased from. These are loopholes that can be plugged in.

7. About Forest Steward Council (SFC)

- The Forest Stewardship Council (FSC) is an international, non-governmental organization dedicated to promoting the responsible management of wood forests.
- Since its foundation in 1994, FSC has grown to become the world's most respected and widespread forest certification system.
- FSC's pioneering certification system, which now covers more than 200 million hectares of forest, enables businesses and consumers to choose wood, paper, and other forest products made with materials that support responsible forestry.

WINDSOR FRAMEWORK

1. Context

The United Kingdom and the European Union struck a deal on February 27 regarding postBrexit trade rules for Northern Ireland, with a view to removing the border between Britain and Northern Ireland running through the Irish Sea. The fact that the Republic of Ireland remained with the EU after Brexit led to

complications on the trade front, a wrinkle that the U. K.'s conservative government ironed out with the Northern Ireland Protocol.

2. What is the backdrop of the issue?

- Ireland is an island that lies to the west of the British mainland and has two separate politically independent territories.
- Northern Ireland, about 1/6th of the total island, is a part of the UK and is administered as a relatively autonomous region.
- The rest of the island forms the 'Republic of Ireland' and is an independent sovereign nation since 1992.
- A hard-fought peace was secured only in 1998 under the Belfast Agreement, also called the Good Friday Agreement.

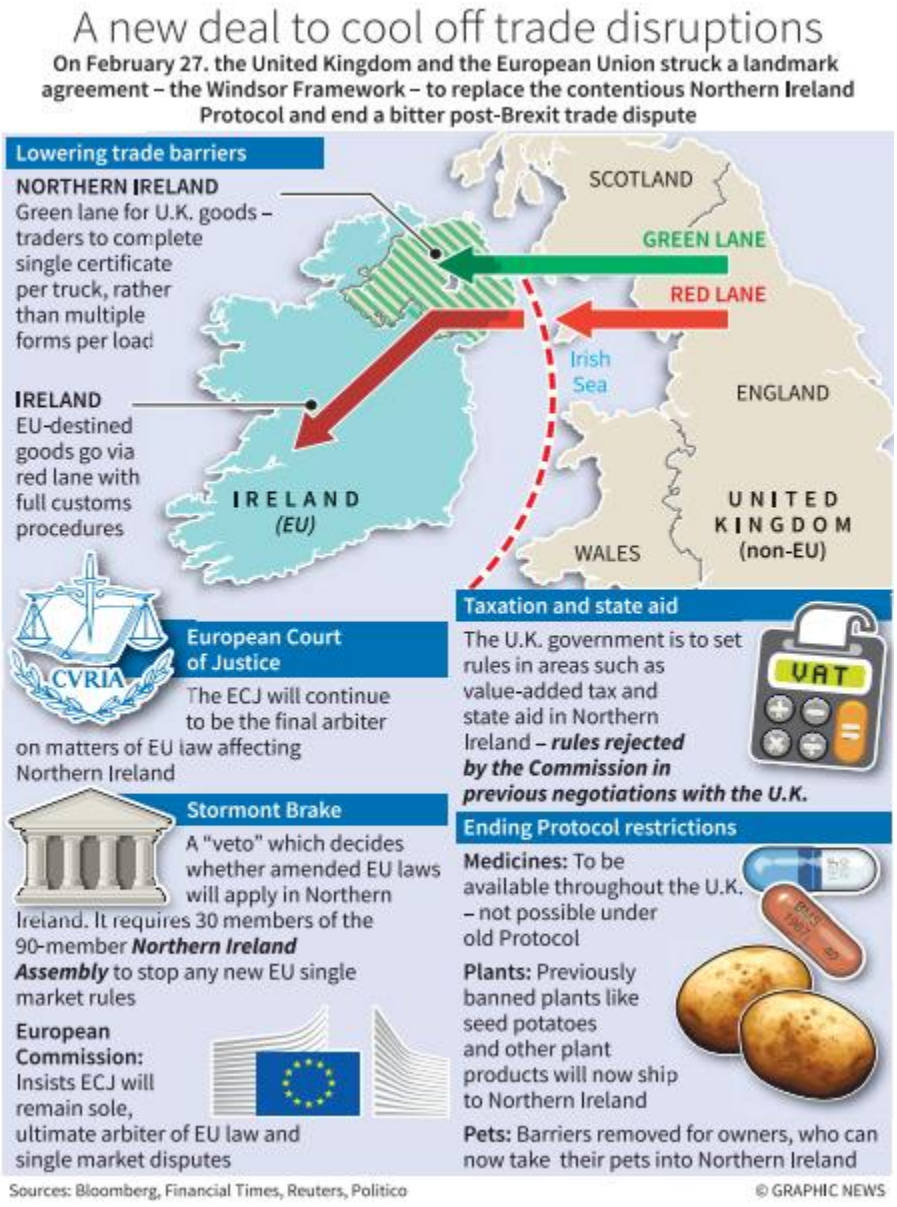
3. Relationship with the European Union

- Both the Republic of Ireland and the UK (thereby Northern Ireland) became members of the 'European Economic Community (EEC) in 1973.
- EEC later evolved to become the EU and also to a great extent helped to ease the tensions between the Unionists & Nationalists.
- As Britain left the EU and exited the single market and customs union, the relationship between Republican Ireland and Northern Ireland has become a challenging puzzle to solve.
- After Brexit, Northern Ireland remained its only constituent that shared a land border with the Republic of Ireland.
- Since the EU and the UK have different product standards, border checks would be necessary before goods could move from Northern Ireland to Ireland.

4. What is Northern Ireland Framework?

- Northern Ireland is a British-ruled province and part of the United Kingdom that shares a long porous border with Ireland, a member of the European Union.
- Trade over the open border when Britain left the EU was one of the most difficult parts of the Brexit negotiations, culminating in the Northern Ireland Protocol.
- The Protocol is part of the Brexit deal, which sets Northern Ireland's trade rules.
- It keeps Northern Ireland inside the EU's single market for goods.

- It keeps the Irish land border open but means products arriving in Northern Ireland from the rest of the UK are subject to checks and controls.
- The checks made trade between Great Britain and Northern Ireland cumbersome.
- Features of Windsor Framework: The framework has two crucial aspects - the introduction of a two lanes system and the 'Stormont Brake".



5. What is the Windsor Framework?

- Windsor Framework is a solution to allow Northern Ireland to remain within the EU's single market and customs union while rolling back many of the cumbersome checks imposed on goods arriving from mainland Britain under the original Brexit deal.
- The UK government had complained that the burden of new paperwork was disrupting trade and effectively created an internal border within a sovereign country.
- The new framework includes a "green" and "red" lane system that will separate goods traveling from Great Britain to Northern Ireland from those contained in the EU. Those not destined for the bloc will be subject to lighter border controls.

6. The Two Lanes system

- Goods from Britain destined for Northern Ireland will travel through a new "green lane", with a separate "red lane" for goods at risk of moving onto the EU.
- Red lane goods would still be subject to checks.
- Bans on certain products like chilled sausages entering Northern Ireland from Great Britain would be removed.
- Northern Ireland would also no longer have to follow certain EU rules, for example, on VAT and alcohol duties. The new agreement reduces the proportion of EU rules applied in Northern Ireland to less than 3%.

7. The Stormont Brake

- It means the democratically elected Northern Island Assembly can oppose new EU goods rules that would have significant and lasting effects on everyday lives in Northern Ireland.
- For this, they will need the support of 30 members from at least 2 parties and the British government can then veto the law.

8. What is the outcome of this framework?

With the Windsor Framework, the UK hopes to improve trade and other ties with the EU. The deal has allowed sunk to do away with the Northern Ireland Protocol Bill introduced by his predecessor Boris Johnson. The bill involved the UK government reneging on the promise it made to the EU to follow the Protocol.

RUSSIA'S New START

1. Context

President Vladimir Putin announced in an address to his nation on Tuesday (February 21) that Russia is suspending its participation in the New START, the last remaining major military agreement with the United States.

2.What is the NEW START

- The name START comes from the original "Strategic Arms Reduction Treaty", known as START-I, which was signed between the US and the erstwhile USSR in 1991, and came into force in 1994
- START-I, which capped the numbers of nuclear warheads and intercontinental ballistic missiles (ICBMs) that each side could deploy at 6,000 and 1,600 respectively, lapsed in 2009, and was replaced first by the Strategic Offensive Reductions Treaty (SORT, also known as the Treaty of Moscow), and then by the New START treaty
- Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms entered into force on February 5, 2011, and placed new verifiable limits on intercontinental-range nuclear weapons
- The two countries had to meet the treaty's central limits on strategic offensive arms by February 5, 2018, and to then stay within those limits for the period the treaty remained in force
- The US and Russia Federation subsequently agreed to extend the treaty through February 4, 2026

3.Imposition of New START on two countries

- The central limits of the treaty that the US and Russia met by February 5, 2018, and have adhered to since then are:
- 700 deployed intercontinental ballistic missiles (ICBMs), deployed submarine-launched ballistic missiles (SLBMs), and deployed heavy bombers equipped for nuclear armaments
- 1,550 nuclear warheads on deployed ICBMs, deployed SLBMs, and deployed heavy bombers equipped for nuclear armaments (each such heavy bomber is counted as one warhead toward this limit)
- 800 deployed and non-deployed ICBM launchers, SLBM launchers, and heavy bombers equipped for nuclear armaments

- According to the State Department summary, these procedures govern the conversion and elimination of strategic offensive arms, the establishment and operation of a database of treaty-required information, transparency measures, a commitment not to interfere with national technical means of verification, the exchange of telemetric information, the conduct of on-site inspection activities, and the operation of the Bilateral Consultative Commission (BCC)
- The treaty provides for 18 on-site inspections per year for US and Russian inspection teams.
- Type One inspections focus on sites with deployed and non-deployed strategic systems (up to 10 per year), and Type Two inspections focus on sites with only non-deployed strategic systems (up to 8 per year), the State Department note says
- Since the New START Treaty's entry into force, as of February 1, 2023, the two parties have conducted 328 on-site inspections, exchanged 25,311 notifications, held 19 meetings of the Bilateral Consultative Commission, and held 42 biannual data exchanges on strategic offensive arms subject to the treaty.

4. Latest Situational developments

- The State Department told Congress in January this year that Russia was not complying with the New START, only remaining nuclear arms control treaty between the two countries, jeopardizing a source of stability in their relationship
- Russia's refusal to facilitate inspection activities prevents the United States from exercising important rights under the treaty and threatens the viability of U.S.-Russian nuclear arms control
- Russia has also failed to comply with the New START treaty obligation to convene a session of the bilateral consultative commission in accordance with the treaty-mandated timeline

WORLD BANK

1. Context

Indian-American business executive Ajay Banga was nominated by US President Joe Biden to head the World Bank. If confirmed by the World Bank board of directors, Banga, 63, will be the first Indian-American to head either of the two top international financial institutions: the International Monetary Fund and the World Bank.

2. World Bank Group

The World Bank Group (WBG) is a family of five international organizations that make leveraged loans i.e. loans given for investment in development to developing countries.

The organizations are

- International Bank for Reconstruction and Development (IBRD).
- International Development Association (IDA).
- International Finance Corporation (IFC).
- Multilateral Investment Guarantee Agency (MIGA).
- International Centre for Settlement of Investment Disputes (ICSID).

3. Structure of World Bank Group

- Among the five international organizations IBRD, IFC and IDA are specialized agencies of the UN while ICSID and MIGA are not specialized agencies.
- The 5 institutions have their own rules and regulations with respect to membership, governing boards, and articles of the agreement but they still work as one to serve partner countries.
- The IBRD and IDA provide loans at preferential rates to member countries, as well as grants to the poorest countries.
- IFC, MIGA, and ICSID focus on strengthening the private sector in developing countries by providing financing, technical assistance, political risk insurance, and settlement of disputes to private enterprises, including financial institutions.
- IFC was formed in 1965 and provides various forms of finance without sovereign guarantees, primarily to the private sector.
- ICSID was created in 1966 and works with governments to reduce investment risk. MIGA established in 1988, provides insurance against certain types of risk, including political risk, primarily to the private sector.

- Each member country in the organization gets voting power according to the shares held in the organization's capital.
- Governing Bodies- The two main governing bodies are the Board of Governors and the Board of Directors. The Board of Governors is appointed by members of the World Bank and meets annually in a joint meeting with IMF's Board of Governors.
- There is a separate Board of Directors for IBRD, IDA, IFC, and MIGA. India is a member of four of the five constituents of the World Bank Group except for ICSID. India is one of the founding members of IBRD, IDA, and IFC.

4. World Bank

- IBRD and IDA are collectively known as World Bank, which provides loans to countries for capital programs.
- They were created at the 1944 Bretton Woods Conference, along with the International Monetary Fund (IMF), and consist of members of 189 member countries.
- The Board of Governors of the respective member countries represents the World Bank and is the main policymaker.

5. Objectives of World Bank

- End extreme poverty i.e decreasing the global population living in extreme poverty to 3 % by 2030.
- Promote shared prosperity i.e. work towards improving the income of the poorest 40 percent of people in every country.
- Work towards sustainable development i.e. the world bank promotes of foreign investment, international trade, and facilitation of capital investment.

6. Initiatives of the World Bank

- Together with the World Health Organisation, the World Bank administers the International Health Partnership (IHP+).
- IHP+ is a group of partners committed to improving the health of citizens in developing countries.
- Clean Air Initiative (CAI) is a World Bank initiative to develop innovative ways to improve air quality in cities through partnerships in selected regions of the world vis shared knowledge and experiences.

7. Reports by World Bank

Doing Business Report, Global Economic Prospects, Global Financial Development Report, International Debt Statistics, World Development Report, World Development Indicators, Poverty and Shared Prosperity.

8. International Bank for Reconstruction and Development (IBRD)

- IBRD has a membership of 189 countries and is the largest global development cooperative bank in the world.
- Its headquarters is in Washington, D.C., USA.
- IBRD was created in 1944 with the objective of providing financial assistance for the reconstruction of European nations devastated during World War II.
- It provides support to the World Bank Group's mission by providing loans, guarantees, risk management products, and advisory services to middle-income and creditworthy low-income countries.
- IBRD provides financial assistance, technical support, and expertise at each stage of a project, across all sectors.
- IBRD places special emphasis on supporting lower-middle-income countries as they move up the economic chain, graduating from IDA to become clients of IBRD.
- It also plays a significant role by contributing to tackling regional and global challenges.
- The Bank's member governments are shareholders which contribute paid-in capital and have the right to vote on its matters.
- In addition to these contributions, the IBRD acquires most of its capital by borrowing on the international capital market through bond issues.
- Each member state of IBRD should also be a member of the International Monetary Fund (IMF) and only members of IBRD can join other institutions within the Bank (such as IDA).

9. International Development Association (IDA)

- The International Development Association (IDA) is an international financial institution that offers concessional loans and grants to the world's poorest developing countries.
- The IDA is a member of the World Bank Group and is headquartered in Washington, D.C., in the United States. It has 173 members.

- It was established in 1960 to complement the existing International Bank for Reconstruction and Development by lending to developing countries that suffer from the lowest gross national income, troubled creditworthiness, or from the lowest per capita income.
- It is considered to be the soft lending window of the World Bank, while the IBRD is considered to be the hard lending window.
- Together, the International Development Association and International Bank for Reconstruction and Development are collectively generally known as the World Bank, as they follow the same executive leadership and operate with the same staff.

INDO-SINO BORDER ISSUES

1. Context

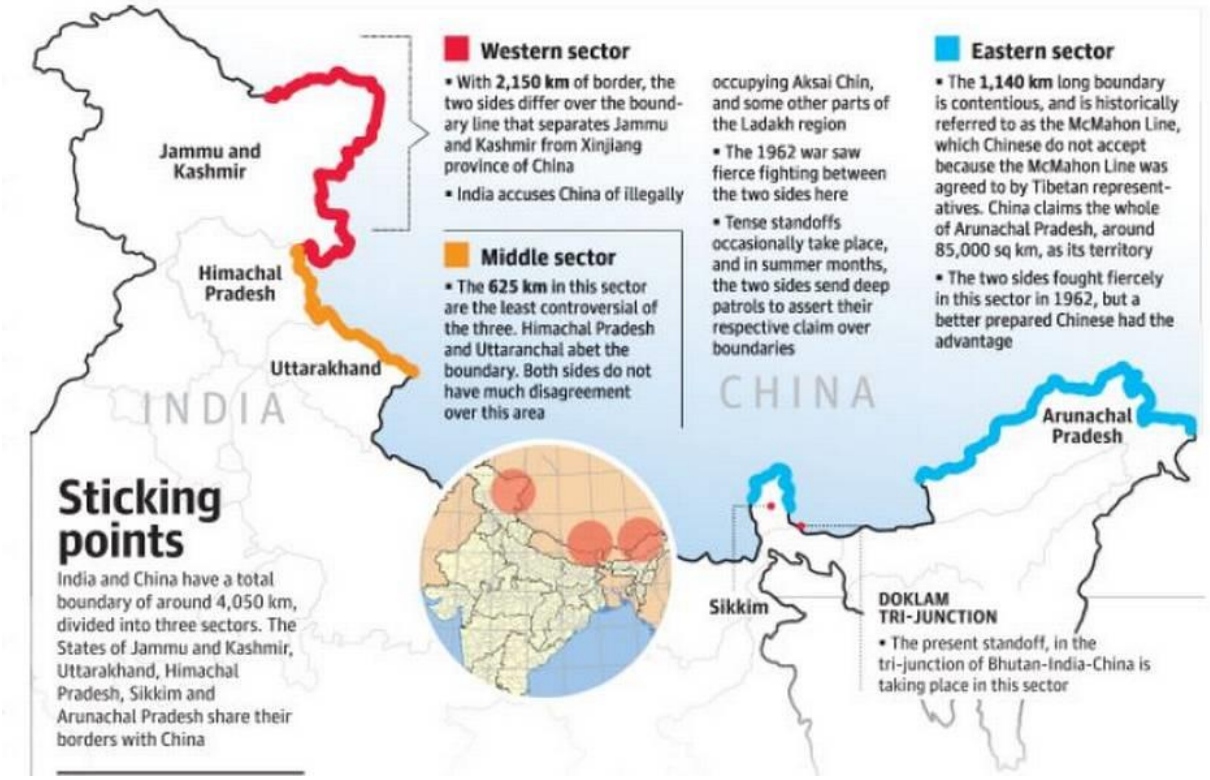
The India-China border dispute is an ongoing territorial dispute between China and India over the sovereignty of two relatively large and several smaller separated pieces of territory.

2. Indo-Sino Border

- The border between India and China is not clearly demarcated throughout. India and China share a total boundary of approximately 3,488 kilometers (second largest after Bangladesh).
- Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh all share a border with China.

- The Sino-Indian border is generally divided into three sectors: the western, middle, and eastern sectors.

- India, following Independence, believed it had inherited boundaries from the British, but this was contrary to China's view. China felt the British had left behind a disputed legacy on the boundary between the two newly formed republics.



3. Western Sector

- India and China share a 2152-Kilometre long border in the western sector. It is located between the Indian states of Jammu and Kashmir and the Chinese province of Xinjiang.
- There is a territorial dispute in this sector over Aksai Chin. In 1962, both countries went to war over the disputed territory of Aksai Chin. It is claimed India is part of Kashmir, while China claims it to be part of Xinjiang.
- The dispute over Aksai Chin can be traced back to the British Empire's failure to establish a clear legal border between China and its Indian colony. During British rule in India, two proposed borders between India and China were Johnson's Line and McDonald's Line.
- The Johnson Line (proposed in 1865) places Aksai Chin in Jammu and Kashmir, under Indian control, whereas the McDonald Line (Proposed in 1893) places it under Chinese control.
- India considers the Johnson Line to be the correct, rightful national border with China, whereas China considers the McDonald Line to be the correct border with India.
- At the moment, the Line of Actual Control (LAC) separates Indian areas of Jammu and Kashmir from Aksai Chin. It runs parallel to the Chinese Aksai Chin claim line.

4. Middle Sector

- In this sector, India and China share a 625-Kilometre long border that runs from Ladakh to Nepal.
- In this sector, the states of Himachal Pradesh and Uttarakhand touch the border with Tibet (China). In this area, there is little disagreement between the two sides.

5. Eastern Sector

- In this sector, India shares a 1,140 km long boundary with China.
- It runs from the eastern limit of Bhutan to a point near the Talu pass at the trijunction of Tibet, India, and Myanmar.
- This boundary line is called as McMohan Line.
- The boundary was established along the Himalayan crest of the northern watershed of the Brahmaputra, except where the Kemang, Subansiri, Dihang, and Lohit rivers break through that watershed.
- China considers the McMohan Line illegal and unacceptable claiming that Tibetan representatives who had signed the 1914 convention held in Shimla which delineated the McMohan Line on the map were not having the right to do so.

6. Line of Actual Control (LAC)

- The LAC is the demarcation that separates Indian-Controlled territory from Chinese-controlled territory.
- India considers the LAC to be 3,488 km long, while the Chinese consider it to be only around 2,000 km.
- The alignment of the LAC in the eastern sector is along the 1914 McMohan Line, and there are minor disputes about the positions.
- India rejected the concept of LAC in both 1959 and 1962.
- After the 1962 war, the Chinese claimed they had withdrawn to 20 km behind the LAC in November 1959.
- During the Doklam crisis in 2017, China urged India to abide by the "1959 LAC".
- India objected that the Chinese line was a disconnected series of points on a map that could be joined up in many ways.

7. Present disputes

7.1 Western sector (Ladakh)(China is seeking claims).

- Trig Heights in the Daulat Beg Oldie (DBO) area
- Demchok in the south
- The Depsang Bulge
- Galwan Valley
- Pangong Lake and Hot Springs

7.2 Middle (central sector):

Barahoti pasture north of Chamoli in Uttarakhand

7.3 Eastern sector (Arunachal Pradesh):

The international boundary and the LAC are defined by the 1914 McMahon Line

China seeks to make inroads:

Tawang sector

Upper Subansiri region

Tri-junction with Myanmar.

BURKINA FASO

1. Context

Burkina Faso was announced led by France in the country.

France signed a military agreement with Burkina Faso in 2018 to achieve stability against the threat of Islamist militant groups.

France signed a series of similar agreements with other West African nations, including Mali and terminated the operation in late 2022.

2. France's withdrawal

- For Paris, the military governments in West Africa pose multiple challenges.

- In February 2022, while announcing the withdrawal of France and its allies from Mali, French President Emmanuel Macron said, "Victory against terror is not possible if it is not supported by the state itself".
- France has also been critical of Russian inroads into Africa.
- It has accused the Russian Private military company Wagner Group of working closely with the military governments in West Africa.
- On January 23, Burkina Faso's military government announced its decision to end the military agreement with France and called on Paris to withdraw its troops within a month.
- The military government and the country wanted themselves to be the prime actors in the recapture of our territory which was controlled by Islamist militant groups.
- On January 26, France agreed to withdraw its troops from Burkina Faso.

3. Reasons for Burkina Faso to end it

- France was asked to withdraw its troops from Burkina Faso Months after it pulled out its troops from Mali.
- The primary reason behind the withdrawal is the failure of its counter-insurgency operations in the Sahel region against Islamist groups.
- Islamist insurgency has surged since 2015 and fuelled two coups in Burkina Faso last year.
- The violence linked to al-Qaeda and Islamic State groups has killed thousands and forced more than two million to flee their homes in the country.
- Secondly, as Islamist insurgency kept intensifying, France's military presence in Burkina Faso came under scrutiny.
- After the second coup in September 2022, anti-France protests increased in Burkina Faso with demonstrators demanding French withdrawal from the country.
- There was also an increasing pro-Russia sentiment. And finally, the ruling military junta of Burkina Faso was looking beyond its traditional allies for support in its counterinsurgency campaign.
- Dissatisfaction with the French approach has made other actors including Russia and China more preferable partners to fight insurgency.

4. Russian involvement

- Russia's engagements in Africa have been under scrutiny for a few years, especially after the resurgence of military governments in West Africa since 2020.
- Following Ouagadougou's announcement of the termination of France operations, Burkinabe Prime Minister Apollinaire Kyelem de Tambela termed Russia "a reasonable Choice".
- Simultaneously, Moscow has been courting African countries; in 2023 alone Russian Foreign Minister Sergei Lavrov visited seven countries in Africa: Angola, Eswatini, South Africa, Eritrea, Mali, Sudan and Mauritania.

Image Source: BBC

5. About Burkina Faso

- Burkina Faso has suffered chronic instability since gaining independence from Frech in 1960, including several coups.
- It is a Landlocked Country and one of West Africa's poorest countries despite being a gold producer and has experienced numerous coups since independence from France in 1960.

- The country's name, meaning "**Land of the Honest men**", was picked by revolutionary military officer Thomas Sankara who took power in 1983. He was topped and killed in 1987.
- Since 2015, the country has been fighting an Islamist insurgency that spilt over from neighbouring Mali.
- This has fuelled anger in the military and damaged the once-important tourist industry.
- Islamist militants control swathes of Burkina Faso's territory and have forced residents in some areas to abide by their harsh version of Islamic law, while the military's struggle to quell the insurgency has drained scarce national resources.

6. The way forward

- Paris has accepted the military government's decision which marks a significant change in its West Africa approach.
- In Burkina Faso, in the absence of France's troops, the alleged Russian mercenaries may fill the security void, as part of its bid to enhance military engagements in the continent.
- However, the new developments are unlikely to address the insurgency and the consequent insecurity.

ISRAEL'S NEW CITIZENSHIP LAW

1.Context

Israel’s parliament Knesset on February 15 passed a law that allows it to deport and “strip convicted terrorists who receive funding from the Palestinian Authority or an associated organization of their citizenship,”

2.Citizenship Law

- The new law is an amendment to Israel’s 1952 Citizenship Law and applies to both Israeli citizens and permanent residents imprisoned after “a conviction for terror, aiding terror, harming Israeli sovereignty, inciting war, or aiding an enemy during wartime”
- Israel’s 1952 Citizenship Law, also known as the “Israel: Nationality Law, 5712-1952” allowed the extension of Israeli nationality to Palestinians under

various conditions, including if "he was a Palestinian citizen immediately before the establishment of the State (of Israel)"

- Section 3 (a) of the 1952 law reads, "A person who, immediately before the establishment of the State, was a Palestinian citizen and who does not become an Israel national under section 2, shall become an Israel national with effect from the day of the establishment of the State" under conditions precedent like registration on the "4th Adar" or he was an inhabitant since before the 1952 law, among others
- However, even before the passage of such a law, Israel's Supreme Court on July 21, 2022, in an appeal filed by the Legal Center for Arab Minority Rights in Israel and the Association for Civil Rights in Israel (ACRI), against the Haifa District Court's 2017 decision, ruled that "disloyal citizens" can be revoked of their citizenship and residency for "breach of loyalty" including acts like espionage, terror, and treason

3.Whose Citizenship will be revoked

1. This law aims to take away the citizenship of "convicted terrorists" if they receive funding from the Palestinian Authority (PA) or any of its associated organisations. According to Al Jazeera, the PA is a semi-autonomous body that currently governs the occupied West Bank and renders financial assistance to the families of Palestinian prisoners in Israeli prisons or "those killed or seriously injured by Israeli forces."
2. However, Israel dubs this the "pay for slay" policy, adding that the requirement to receive PA-linked money makes the law inapplicable to Jewish terrorists
3. A "convicted terrorist" can either be a Palestinian citizen of Israel or a Palestinian resident of occupied and annexed East Jerusalem holding Israeli residency

4. Reasons for this law to be passed

- The new law is aimed at serving as a deterrent to terrorism and comes in the wake of far-right leaders vowing to impose stringent measures against Palestinians amidst what it deems as a rise in attacks on Israelis by Palestinian residents of Israel.
- According to the New York Times, Palestinian residents of Israel have killed at least 11 Israelis since the start of the year, whereas close to 50 Palestinians

have been killed in the West Bank since the beginning of 2023, often during Israeli operations

- The Israeli government also authorised nine previously unauthorised Jewish settlements in the West Bank amidst escalating tension with the Palestinians
- On the other hand, Arab lawmakers in the Knesset such as Ahmad Tibi have called the new law "racist" on account of its applicability to only Palestinians, as opposed to Jewish terrorists, through the requirement that those receiving PA funds will cease to be citizens
- The new citizenship law was passed despite a warning from a Justice Ministry senior legal adviser Avital Sternberg, who told the Times of Israel, "This proposal is complicated and poses legal difficulties," adding that the law's failure to consider a letter of declaration from the PA affirming that there are no ties between itself and the terrorist as proof could be a possible "legal impediment"

GS II: Polity

ECI APPOINTMENTS

1. Context

As far back as 1949, when the Chairman of the Drafting Committee Dr. B R Ambedkar told the Constituent Assembly that thinking about an "unfit person" becoming Chief Election Commissioner gave him a "headache", the issue of how appointments to the Election Commission of India (ECI) are to be made has been a tricky question.

2. Constitutional Provision

- Article 324(2) of the Constitution only says that "the appointment of the Chief Election Commissioner and other Election Commissioners shall, subject to the provisions of any law made on that behalf by Parliament, be made by the President", which essentially gives the central government the power to appoint the members of the ECI.
- The Supreme Court on Thursday gave its answer to the problem when it ruled that the Chief Election Commissioner (CEC) and the two Election Commissioners (EC) that make up the ECI should be appointed on the

advice of a committee comprising the Prime Minister, the Leader of the Opposition in the Lok Sabha and the Chief Justice of India.
- In its Judgement, the apex court said its arrangement of the committee would remain till parliament passes a law on the subject.

3. Structure of ECI

- Originally the commission had only one election commissioner but after the Election Commissioner Amendment Act 1989, it has been made a multi-member body.
- The Election Commission shall consist of the Chief Election Commissioner (CEC) and such number of other election commissioners if any, as the President may from time to time fix.
- Presently, it consists of the CEC and two Election Commissioners.
- At the state level, the election commission is helped by the Chief Electoral Officer who is an IAS rank Officer.

4. Appointment & Tenure of Commissioners

- The President appoints CEC and Election Commissioners.
- They have a fixed tenure of six years, or up to the age of 65 years, whichever is earlier.
- They enjoy the same status and receive salary and perks as available to Judges of the Supreme Court (SC) of India.

5. Removal

- They can resign anytime or can also be removed before the expiry of their term.
- The CEC can be removed from office only through a process of removal similar to that of an SC judge by parliament.

6. Procedure for Removal

- Judges of High Courts and Supreme Court, CEC, Comptroller and Auditor General (CAG) may be removed from office through a motion adopted by parliament on grounds of 'proved misbehavior or incapacity'.
- Removal requires a special majority of 2/3rd members present and voting supported by more than 50% of the total strength of the house.

- The Constitution does not use the word 'impeachment', for the removal of the judges, CAG, and CEC.
- The term 'Impeachment' is only used for removing the President which requires a special majority of 2/3 rd members of the total strength of both houses which is not used elsewhere.

7. Current Process of appointment of EC and CEC

- The Chief election commissioner and other ECs are appointed by the President on recommendations of the central government. This raises a question about the partisan behavior of officials toward the ruling party.
- Appointment of Election Commissioners falls within the purview of Article 324(2) of the Constitution.
- Although the Constitution provided the 'subject to' clause in which Parliament has the power to decide the appointment procedure for ECs, Parliament has so far not enacted any changes to the appointment process.

8. Views on the Current Process

- The Election Commission is not only responsible for conducting free and fair elections, but it also has quasi-judicial functions, so the Executive cannot be a sole participant in the appointment process. This also gives the ruling party unlimited power to choose someone whose loyalty to it is ensured.
- The current process also lacks transparency.
- Several petitions in SC have called the current practice into question. They argue that the current practice of appointment violates Articles 14, 324(2), and democracy as a basic feature of the Constitution.

9. What were the Concerns that Ambedkar expressed?

- While discussing the appointment of the Chief Election Commissioner by the President, Dr. Ambedkar expressed his apprehensions in the Constituent Assembly on June 16, 1949.
- Giving the example of the United States, where the Senate has some say on certain appointments by the President, Ambedkar noted that the Provision in the American Constitution was a 'very salutary check upon the extravagance of the President in making his appointments'.
- These checks, he said, were likely to lead to "administrative difficulties".

- The Drafting Committee had paid considerable attention to this question because as Ambedkar said it is going to be one of our greatest headaches and as a via media, it was thought that if this Assembly would give or enact what is called an Instrument of Instructions to the President and provide therein some machinery which it would be obligatory on the President to consult before making any appointment, Ambedkar thought that the difficulties which are felt as resulting from the American Constitution may be obviated and the advantage which is contained therein may be secured.

10. Recommendations on the Selection Process

- Over the years, the question of the independence of the ECI from the executive has cropped up several times, given that the persons appointed to the posts have been retired senior bureaucrats.
- The UPA-era Second Administrative Reforms Commission in its report in January 2007 recommended that a collegium headed by the Prime Minister and comprising the Lok sabha speaker, the Leader of the Opposition in the Lok Sabha, the Law Minister, and the Deputy Chairperson of the Rajya Sabha be formed to make recommendations to the President regarding appointments of the CEC and ECs.
- During debates in the Constituent Assembly on the procedure for appointment, there were suggestions that the person appointed as the Chief Election Commissioner should enjoy the confidence of all parties, and therefore his appointment should be confirmed by a 2/3 majority of both Houses.
- Thus even at that stage, there was a view that the procedure for appointment should be a broad-based one, above all partisan considerations," the reforms commission report stated.
- Giving the example of the Committees for the appointment of the National Human Rights Commission and Central Vigilance Commissioner chairperson and members, the reforms committee said: Given the far-reaching importance and critical role of the Election Commission in the working of our democracy, it would certainly be appropriate if a similar collegium is constituted for selection of the Chief Election Commissioner and the Election Commissioners.

WHIP IN THE LEGISLATURE

1. Context

Members of a House are bound by the 'whip', and if any section of MLAs within a political party that is part of a ruling coalition says it does not want to go with the alliance, the MLAs will attract **disqualification**

A five-judge Bench led by Chief Justice of India (CJI) D Y Chandrachud is hearing petitions filed in the wake of last year's political crisis in Maharashtra precipitated by a division in the Shiv Sena

2.What is 'Whip' in the House

- In parliamentary parlance, a whip may refer to both a written order to members of a party in the House to abide by a certain direction, and to a designated official of the party who is authorised to issue such a direction
- The term is derived from the old British practice of "whipping in" lawmakers to follow the party line
- A whip may require that party members be present in the House for an important vote, or that they vote only in a particular way
- In India, all parties can issue whips to their members
- Parties appoint a senior member from among their House contingents to issue whips this member is called a chief whip, and he/ she is assisted by additional whips

3.Seriousness of Whip issued by Parties

- Whips can be of varying degrees of seriousness. The importance of a whip can be inferred from the number of times an order is underlined
- A one-line whip, underlined once, is usually issued to inform party members of a vote, and allows them to abstain in case they decide not to follow the party line
- A two-line whip directs them to be present during the vote.
- A three-line whip is the strongest, employed on important occasions such as the second reading of a Bill or a no-confidence motion, and places an obligation on members to toe the party line
- The penalty for defying a whip varies from country to country. In the United Kingdom, an MP can lose membership of the party for defying the whip, but can keep her/ his House seat as an Independent
- In the US, as per a note published by PRS Legislative Research, "the party whip's role is to gauge how many legislators are in support of a Bill and how many are opposed to it and to the extent possible, persuade them to vote according to the party line on the issue"

- In India, rebelling against a three-line whip can put a lawmaker's membership of the House at risk.
- The anti-defection law allows the Speaker/ Chairperson to disqualify such a member; the only exception is when more than a third of legislators vote against a directive, effectively splitting the party

INTERNET SHUTDOWN

1. Context

Following the brutal on-camera killing of tailor Kanhaiyalal Teli in Udaipur by two men, the Rajasthan government imposed a ban on Internet services. Shutting down the Internet as an administrative or law-and-order measure has been a common step taken across India for a range of reasons and by almost all political parties and governments.

2. What do the data on internet suspensions say?

- According to the Software Freedom Law Center (SFLC), a large services organization working in this field in India, since 2012 there gave been 665 Internet shutdowns in India to date.
- Here, 'shutdowns' mean a total ban on mobile (3G, 4G/LTE), or fixed-line (dial-up, wired/wireless broadband) Internet, both of which may be shut down.
- According to Internet freedom and tech policy organizations, India is the leading country (by number) for Internet disruption incidents and the frequency of shutdowns.
- This year, 59 shutdowns have been enforced, according to SFLC, which determines shutdowns based on government orders and media reports.

3. Internet shutdowns in States

- Jammu and Kashmir have had more than 411 shutdowns since 2012, and the longest one went on far more than 552 days after the abrogation of the special status of the erstwhile state.

- Among the states, Rajasthan has had the most shutdowns with 88 such instances in almost 10 years. The reasons have ranged from protests by the Gujjar community for reservation, to preventing cheating in the Rajasthan Eligibility Examination for Teachers (REET) held to select primary school teachers last year, which was taken by an estimated 16 lakh aspirants.

4. How do governments justify shutting down the Internet?

- Governments say misinformation and rumors can lead to deterioration in law and order in an area, so curbing the flow of information helps maintain peace among communities in times of crisis.
- But many experts have countered that in the absence of information sources like news outlets, rumors lly end up spreading even more.
- Also, important services such as those related to payments, banking, and educational access, all get cut in an instant, resulting in disruptions at multiple levels and economic losses.

5. Provisions regarding Internet Shutdowns in India

India telegraph act 1885

Section 7 of the aforementioned act has been amended to include temporary suspension of telecom services (public emergency and public safety)rules.

As per rules, only the home secretary of the union or the state can issue such an order, it has to be reviewed by a committee within 5 days. such an order shall not be operational for more than 15 days.

Powers under section 144 CrPC

In an unavoidable circumstances, the order can be issued by an office of the rank of joint secretary or above, authorized by the union or state home secretary.

Section 69(A) of the information technology Act 2008

It gives the government power to block particular websites and not the internet as a whole.

6. Arguments favoring Internet Shutdowns

Deterrent to hate speech and fake news

The Internet has become a medium for spreading animosity and hatred against various religious and ethnic groups. Xenophobic tendencies can be effectively tackled.

Ensure peace and stability

Internet shutdowns may be seen as a preventive measure used by the law & order administration as a last resort to address mass protests, and civil unrest, curbing the spread of misinformation to ensure peace and public safety.

Avoid Anarchy

In certain extreme situations where rumors through Whatsapp and other social media start playing a disruptive role, it may become necessary to have internet shutdowns.

7. Arguments against Internet Shutdowns

Human rights violations

Kerela high court's judgment in Faheema Shirin v/s State of Kerela, where the right to internet access was recognized as a fundamental right forming a part of the right to privacy and the right to education under Article 21 of the constitution.

Social Cost

Essential services like education, Health, Public services, etc are held back. Internet shutdown is also causing a digital divide and disparity in education, especially in the instances of the COVID-19 pandemic.

Fails to achieve the objective

There is no conclusive evidence showing that Internet shutdowns lead to the maintenance or restoration of public order.

Social Chaos

Shutting down the internet results in an information blackout that can also create hysteria, and panic and can result in even more discord.

RIGHT TO BE FORGOTTEN

1. Context

The Delhi High Court, on March 15, is all set to hear a doctor's plea for enforcement of his 'Right to be Forgotten, which includes the removal of news articles and other incriminating content related to his "wrongful arrest" in response to a "fabricated FIR against him" which he claims is causing detriment to his life and personal liberty.

2. What is the Right to be Forgotten?

The "Right to be Forgotten" is the right to remove or erase content so that it's not accessible to the public at large. It empowers an individual to have information in the form of news, video, or photographs deleted from internet records so it does not show up through search engines, like google in the present case.

3. What is the law on the Right to be Forgotten?

- Section 43A of the Information Technology Act, 2000 says that organizations who possess sensitive personal data and fail to maintain appropriate security to safeguard such data, resulting in wrongful loss or wrongful gain to anyone, may be obligated to pay damages to the affected person.
- While, the IT Rules, 2021 do not include this right, they do however, lay down the procedure for filing complaints with the designated Grievance Offitos to have content exposing personal information about a complainant removed from the internet.
- Moreover, on December 11, 2019, the Ministry of Electronics and Information Technology introduced the Personal Data Protection Bill in the Lok Sabha.
- While the bill is yet to be passed by the parliament, owing to a parliamentary joint committee's suggestion to amend 81 of the 99 sections of the same, clause 20 under chapter V of the draft bill titled, "Rights of Data Principal" mentions the "Right to be Forgotten" as the right to restrict or prevent the continuing disclosure of personal data by a "data fiduciary".

4. Origin of this right

- The Right to be Forgotten gained importance after the 2014 decision of the court of Justice of the European Union (CJEU) in the Google Spain Case.

- The right to be Forgotten has been recognized as a statutory right in the Europen Union under the General data protection Regulation (GDPR).
- It has been upheld by several courts in the United Kingdom, and in Europe.

5. Status in India

- In India, no law specifically provides for the right to be forgotten. However, the Personal Data Protection Bill 2019 recognized this right.
- Information Technology Act, of 2000 provides for safeguarding against certain breaches of data from computer systems.
- It contains provisions to prevent the unauthorized use of computers, computer systems, and data stored therein.

6. Right to Privacy and Right to be Forgotten

- The Right to be Forgotten falls under the purview of an individual's right to privacy, which is governed by the Personal Data Protection Bill, 2019.
- In 2017, the Right to Privacy was declared a fundamental right by the Supreme Court in its landmark Puttaswamy case verdict.
- The court said that "the right to privacy is protected as an intrinsic part of the right to life and personal liberty under Article 21 and as a part of the freedoms guaranteed by Part III of the Constitution."

7. Challenges

7.1 Conflict with public Record

- The right to be forgotten may get into conflict with matters involving public records.
- For instance, judgments have always been treated as public records and fall within the definition of a public document according to section 74 of the Indian Evidence Act, of 1872.
- The Right to be Forgotten can not be extended to official public records, especially judicial records as that would undermine public faith in the judicial system in the long run.

7.2 Individual vs Society

The right to be Forgotten creates a dilemma between the right to privacy of individuals and the right to information of society and freedom of the press.

TENTH SCHEDULE OF THE INDIAN CONSTITUTION

1.Context

A five-judge Bench of the Supreme Court of India is presently hearing a set of cases popularly known as the “Maharashtra political controversy cases”. These cases arose out of the events in June last year, when the ruling Maha Vikas Aghadi (MVA) coalition (the Shiv Sena, the Nationalist Congress Party and Congress) lost power after an internal splintering of the Shiv Sena party.

2.About Tenth Schedule

The anti-defection law was introduced into the Constitution via the Tenth Schedule, in 1985

Its purpose was to check increasingly frequent floor-crossing; lured by money, ministerial berths, threats, or a combination of the three, legislators were regularly switching party affiliations in the house (and bringing down governments with them)

The Tenth Schedule sought to put a stop to this by stipulating that if any legislator voted against the party whip, he or she would be disqualified from the house

While on the one hand this empowered party leadership against the legislative backbench, and weakened the prospect of intra-party dissent, the Tenth Schedule viewed this as an acceptable compromise in the interests of checking unprincipled floor-crossing

3.Present Scenario

In the last few years, there have been innumerable instances of governments being "toppled" mid-term after a set of the ruling party or coalition's own members turn against it.

That this is power-politics and no high-minded expression of intra-party dissent is evident from the well-documented rise of "resort-politics", where party leaders hold their "flock" more or less captive within expensive holiday resorts, so as to prevent the other side from getting at them

Politicians have adopted various stratagems to do an end-run around the anti-defection law

Recent examples involve mass resignations (instead of defections) to force a fresh election, partisan actions by State Governors (who are nominees of the central government) with respect to swearing-in ceremonies and the timing of floor tests, and equally partisan actions by Speakers (in refusing to decide disqualification petitions, or acting in undue haste to do so). The upshot of this is that, in effect, the Tenth Schedule has been reduced to a nullity: governments that do not have clear majorities are vulnerable, at any point, to being "toppled" in this fashion

4.Role of Courts

With scenarios like now, Supreme Court role is very crucial these days

Disputes over government formation and government toppling invariably end up before the highest court

It must immediately be acknowledged that such cases place the Court in an unenviable position: the Court has to adjudicate the actions of a number of constitutional functionaries: Governors, Speakers, legislative party leaders, elected representatives, many (if not all) of whom, to put it charitably, have acted dubiously

But the Court does not have the liberty of presuming dishonesty: it must maintain an institutional arm's-length from the political actors, and adjudicate according to legalities, even as political actors in anti-defection cases do their best to undermine legality, which is a challenging task

This is one of those situations where the proof of the pudding is in the eating: despite the fact that the Court's intervention has been sought in every one of these cases, and despite the fact that in recent years the Supreme Court has handed down multiple substantive judgments on anti-defection, the toppling of governments remains as frequent as ever

5. Examples

Court's judgment in the Karnataka political controversy, which effectively sanctified resignations as an end-run around the anti-defection clause

Present case of Maharashtra makes it unique case:

The Deputy Speaker (there was no Speaker at the time) moved to disqualify the "rebels" who in turn moved the Court, arguing that there was a pending no-confidence motion against the Deputy Speaker, and therefore, as per the Supreme Court's judgment in Nabam Rebia, he was disqualified from deciding on the disqualifications while it was pending.

6.Way Forward

It is held that a Speaker cannot decide a disqualification petition while under a notice for removal themselves, and that a floor test can be ordered in the interim (by the Governor or the court), the consequences are obvious: a "rebel MLA" can move a notice for removal, incapacitate the Speaker from taking action, and leave rebel MLAs free to bring down the government without consequence.

SECTION 153A OF IPC

1. Context

The Supreme Court on Thursday granted interim bail to Pawan Khera, Chairman of the media and publicity department of the All India Congress Committee, who had been arrested for alleged hate speech by Assam Police earlier in the day.

2. Section 153A of IPC

- Section 153A deals with promoting enmity between different groups on grounds of religion, race, place of birth, residence, language, etc., and doing acts prejudicial to the maintenance of harmony.
- Under this section, the person shall be punished with imprisonment which may extend to five years, and shall also be liable to a fine.
- Section 295A deals with deliberate and malicious acts, intended to outrage the religious feelings of any class by insulting its religion or religious beliefs.
- The person can be punished with imprisonment of either description for a term that may extend to two years, with a fine, or with both.

3. Drawbacks

- Element of subjectivity leads to misuse of the law as it has a large amount of subjectivity.
- Unlike bodily harm that can be verified, sentimental hurt can not be tested against strict measures.
- The element of subjectivity overrides it as a sentiment's vulnerability could widely vary.
- Encroaches on Freedom of Speech and Expression: India's Constitution celebrates diversity with the guarantee of free speech.
- It is anomalous for a pluralistic, democratic, and secular nation that runs on counter-discourses to criminalize speech for hurting religious sentiments.
- People have used this section to file frivolous cases for venting out a personal vendetta.
- The already overburdened judiciary is put under further strain due to the resources it needs to direct toward frivolous cases hindering the efficacy of the judicial system.

4. Why such sections are needed in India?

- India being a diverse entity needs such laws to stop religious incendiary feelings in the bud.
- Helps check radicalism growth of communal divisions and domination of one community.
- Helps the propagation of secular values by making religious extremism/insensitivity a punishable offense.
- Punishes those involved in such activities and acts as a deterrent for others.

5. Safeguards against misuse

- There are statutory safeguards (to invoke the section) that required deliberate intention and malice; and judicial rulings that needed to look at words used, intent, and effect to ascertain criminality. Only a deliberate and aggravated form of religious insult would attract the rigor of the provision.
- The judiciary laid down two ways to measure the effect one by establishing a link between speech and public disorder, and by measuring the effects from the standards of a reasonable man, and not from one who fears all hostile viewpoints.
- However, no attempt was made to translate the safeguards into practice.

DAY-NRLM

1.Context

A conclave on exploring synergies between DAY-NRLM's initiatives of Rural Transformation and Corporate House's CSR efforts in rural areas was held under the chairpersonship of Additional Secretary, Rural Livelihoods (RL), Shri Charanjit Singh in New Delhi

In his keynote address, AS (RL) Shri Charanjit Singh stated that the aim of DAY-NRLM is to uplift the lives of the people at the last mile and for that it is important to bring together as many partners as we can. He added the approach needs to be expanded from 'Whole of Government' to 'Whole of Society' towards 'Antyodaya' as guided by the Prime Minister Shri Narendra Modi

2.About DAY-NRLM

Deendayal Antyodaya Yojana-National Rural Livelihood Mission (DAY-NRLM) as a flagship poverty alleviation program aims to reduce poverty by enabling the poor household to access gainful self-employment and skilled wage employment opportunities resulting in sustainable and diversified livelihood options for the poor

This is one of the world's largest initiatives to improve the livelihoods of the poor

The Mission seeks to achieve its objective through investing in four core components

1.social mobilization and promotion and strengthening of self-managed and financially sustainable community institutions of the rural poor women

2.financial inclusion

3.sustainable livelihoods

4.social inclusion, social development and access to entitlements through convergence

DAY-NRLM promotes sustainable agriculture, livestock and NTFPs in intensive blocks under the Farm interventions

The focus of the interventions is on training and capacity building, and promotion of agro-ecological practices as well as livestock practices to enhance crop and animal productivity.

3.CSR in Rural Development

It is important to note that the CSR budget spend is not necessarily a reflection of the effectiveness or impact of a company's CSR initiatives

There are also concerns about companies fulfilling the mandatory spending by making token donations or CSR activities that lack strategic planning and impact assessment

Corporate Social Responsibility (CSR) initiatives can face several pain areas or challenges in their implementation, some of them are:

3.1.Regional Disparity: Due to compulsion of expenditure in the act to spend the amount in the catchment area of the operations, so it has been observed that in the same geographical area many of the organizations are working, whereas in some areas there is a little spending. This leads to regional disparity, where some community are not able to receive any support.

3.2.Sectoral Disparity: As per the CSR act, every organization has a CSR mandate to spend on the sectors defined as per SDG. As every organization can

decide its expenditure independently, so it has been realized that some sectors are receiving a lot of funds, whereas other sectors are not able to get adequate budgetary allocation

3.3.Treatment of Unspent Budget: The latest amendment in the act requires companies to deposit the unspent CSR funds into a fund prescribed under schedule VII of the act within the end of the fiscal year.

3.4.Finding the right Implementation Partners: Companies may not effectively engage with their stakeholders, such as communities, NGOs, and other organizations, so finding the right Implementation Agency is a difficult task

3.5.Duplication of activities in the same project area: Companies may not have information about all the beneficiaries and the support they are receiving from different CSR initiative, so there are high chances of duplication in the project area, where the benefits are drawn from the same set of beneficiaries

3.6.Limited sustainability: Companies may not focus on long-term sustainability and may not have the ability to scale their CSR initiatives to achieve greater impact

3.7.Compliance over Impact: Companies may focus more on compliance with legal requirements, rather than on the impact of their CSR initiatives.

3.8.Tokenism: Companies may make token donations or undertake CSR activities that lack strategic planning and impact assessment, just for the sake of fulfilling the mandatory spending

3.9.Lack of Community Participation: Majority of the companies focus on expenditure, but may fail to ensure participation of community due to lack of systems

ONLINE SALE OF DRUGS

1. Context

In early February, the Ministry of Health pulled up at least twenty companies including Tata 1mg, Flipkart, Apollo, Pharm easy, Amazon, and Reliance Netmeds, by issuing them a show cause notice, for selling medicines online.

2. Pharmacy market in India

- Unlike the US, where the top three pharmaceutical distributors have a 90 percent share in the market, India is a fragmented market with over 8 lakh pharmacies.
- This gives online pharmacies an opportunity to capture their space without opposing large traditional retailers.
- Currently, companies in the Indian e-pharmacy space mainly operate three business models-marketplace, inventory-led hybrid (offline/online), and franchise-led hybrid (offline/online) depending on the way the supply chain is structured.

3. Banning epharmacies a viable option?

- The Ministry of Health has adopted a ‘blow hot blow cold’ approach towards online pharmacies.
- The acute need for door step delivery of drugs was felt during COVID19.
- The year 2020 marked a watershed moment for the growth of epharmacies as the Ministry of Home Affairs issued orders for them to continue to operate.
- It saw nearly 8.8 million households using home delivery services during the lockdown.

4. Draft e-pharmacy regulations

- Draft rules for e-pharmacies sought to define the online sale of medicines, what an e-prescription means, and what type of licenses online firms would need to get from regulators to operate.
- The draft had proposed to allow e-pharmacies to get a central license to operate from the country's apex drug regulator, which could be used to allow them to operate across the country.
- It also proposed to define e-pharmacies in a way that would allow them to distribute, sell, and stock medicines.

- The proposed regulations prevent them from selling habit-forming drugs like cough syrups specified in Schedule X of the Indian drug regulation.

5. E-pharmacies competing with momandpop chemist shops

- E-pharmacies call themselves facilitators of doorstep delivery. They claim tie-ups with retail chemists for vending medicines. However, since profit margins in the drug retail industry are very thin, just about 15% to 16%, every player in the supply chain is struggling to make money.
- Therefore, companies like PharmEasy, in a move to circumvent retail chemists are building a supply chain from the ground up buying out big and small wholesale drug distributors like Ascent Health, Desai pharma, and eastern agencies healthcare among others.

6. Online pharma is going on a scale

- While Covid -19 and the subsequent behavioral shift towards e-commerce may have catalyzed growth for online pharmacies, the sector was already poised to grow seven-fold by 2023 to $2.7 billion.
- This was mainly on account of the challenges faced by physical pharmacies that gave their online counterparts a problem to solve.
- Experts believe that e-pharmacies will be able to solve the problems that traditional pharmacies couldn't.
- But for this year, they need to have a large-scale presence that calls for either huge investments or consolidation.

7. Way forward

- The e-pharmacy sector holds immense potential to address the persisting issue of affordability and accessibility of medicines in India.
- Steps should be taken to foster the e-pharmacy sector with sufficient safeguards and under stringent regulatory control to protect the interest of the consumers.
- Specified and clear-cut rules should be made for selling, prescribing, dispensing, and delivering prescription drugs through e-pharmacies.
- A stringent licensing mechanism should be adopted for e-pharmacies. Government should make a common logo for legally operating e-pharmacies to distinguish them from illegal ones. For example, The European Union (EU) has issued a common logo for legal operation e-pharmacies in the EU member states.

"CORRUPT PRACTICES" UNDER THE REPRESENTATION OF PEOPLE'S ACT 1951

1.Context

Supreme Court observed that no one in India votes for a candidate based on their educational qualifications and, thus providing false information about an electoral candidate's qualifications cannot be considered a "corrupt practice" under Sections 123 (2) and Section 123 (4) of the Representation of People's Act, 1951.

2.Corrupt Practices of RPA 1951

- Section 123 of the Act defines 'corrupt practices' to include bribery, undue influence, false information, and promotion or attempted promotion of "feelings of enmity or hatred between different classes of the citizens of India on grounds of religion, race, caste, community, or language" by a candidate for the furtherance of his prospects in the election
- Section 123 (2) deals with 'undue influence' which it defines as "any direct or indirect interference or attempt to interfere on the part of the candidate or his agent, or of any other person, with the consent of the candidate or his election agent, with the free exercise of any electoral right."
- This could also include threats of injury, social ostracism and expulsion from any caste or community.
- Moreover, convincing a candidate or an elector that they will become "an object of divine displeasure or spiritual censure" will also be considered an interference "with the free exercise of the electoral right of such candidate or elector."
- Section 123 (4) extends the ambit of "corrupt practices" to the intentional publication of false statements which can prejudice the outcome of the candidate's election
- Under the provisions of the Act, an elected representative can be disqualified if convicted of certain offences; on grounds of corrupt practices; for failing to declare election expenses; and for interests in government contracts or works.

3.Instances of Corrupt Practices

- In 2017, a seven-judge constitution bench of the apex court headed by former Chief Justice TS Thakur in 'Abhiram Singh v C.D. Commachen' held that an election will be annulled if votes are sought in the name of a candidate's religion, race, caste, community, or language, as per Section 123 (3) which prohibits the same
- In 1994, the Supreme Court's ruling in 'SR Bommai v. Union of India', which otherwise held secularism to be a part of the 'basic structure', the court said, "whatever the attitude of the State towards the religions, religious sects, and denominations, religion cannot be mixed with any secular activity of the State
- The encroachment of religion into secular activities is strictly prohibited, the court stated while adding that the same is clear from sub-section (3) of Section 123 of the Representation of the People Act, 1951
- However, even as far back as 1955, the Apex Court in 'Jamuna Prasad Mukhariya v. Lacchi Ram' upheld the constitutional validity of Section 123 (3).

4.Way Forward

More recently in 2022, the top court directed a three-judge bench to look into prayers for reconsidering its 2013 judgment in 'S. Subramaniam Balaji vs State of Tamil Nadu', where the court held that promises of freebies cannot be termed a corrupt practice. However, the matter is still yet to be decided

CENTRAL WATER COMMISSION

1. Context

The Central Water Commission (CWC), Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti entered into a Memorandum of Agreement for Development of International Centre of Excellence for Dams (ICED) under externally funded Dam Rehabilitation and Improvement Project Phase II and Phase III.

2. About Central Water Commission

- CWC is an attached office of the Ministry of Jai Shakti Department of Water Resources, River Development and Ganga Rejuvenation.

The Commission is entrusted with the general responsibilities of initiating, coordinating and furthering in consultation with the State Governments concerned, schemes for control, conservation and utilization of water resources throughout the country for purpose of Flood Control, Irrigation, Navigation, Drinking Water Supply and Water Power Development.

- It undertakes the investigations, construction and execution of any such schemes as required.
- It is headed by a chairman, with the status of Ex Officio Secretary to the Government of India. Its headquarters at New Delhi.
- The Work of the Commission is divided among 3 wings namely, the Designs and Research (D & R) Wing, River Management (RM) Wing and Water Planning and Projects (WP & P) Wing.
- A separate Human Resources Management Unit headed by Chief Engineer deals with Human Resources Management or Development, Financial Management, Training and Administrative matters of the CWC.
- **National Water Academy** located in Pune is responsible for the training of Central and State in-service engineers and it functions directly under the guidance of the Chairman.

3. Dam Rehabilitation and Improvement Project (DRIP) Project

- The Project was launched in 2012 by the CWC with financial aid from the World Bank.
- It is an externally-aided project with 80 per cent of the total project provided by the World Bank as loan/ credit and the remaining 20 per cent being borne by the states/ Central government.
- The total cost of the Project was Rs 2100 crores and the amount allocated for Phase II and III is Rs. 10, 211 crores.
- The project was launched in 2020, with DRIP Phase II and III, with similar objectives on a larger scale.
- There were 225 dams which were covered for rehabilitation and improvement in terms of safety measures.

3.1. Objectives

- To improve the safety and performance of selected existing dams and associated appurtenances in a sustainable manner.

- To strengthen the dam safety institutional setup in participating states as well as at the central level.
- To explore the alternative incidental means at a few selected dams to generate the incidental revenue for sustainable operation and maintenance of dams.

3.2. Components

- Rehabilitation of selected dams and their appurtenances
- Institutional Strengthening
- Project Management

- The formation of the International Centre of Excellence for Dams (ICED) will empower 'Make in India' in dam safety, plus augment advanced research and developing technologies and application products.
- The ICED is being set up at 109 Crore, being borne by the Department of Water Resources, Ganga Rejuvenation & River Development, Ministry of Jal Shakti, Government of India as a non-recurring grant in six tranches.
- ICED, Roorkee will provide specialized technical support in investigations, modelling, research and innovations, and technical support services to the Indian and overseas dam owners.
- IITR will endeavour to reach a level of self-sufficiency within ten (10) years by generating income streams through the knowledge and capabilities developed on dam safety & rehabilitation in general and in the core areas of reservoir sedimentation and seismic hazard mapping and analysis in particular.
- The Centre will work for agreed dam safety areas to support and provide solutions to various emerging challenges faced in dam safety through scientific research and the latest technology and digital innovations.
- IITR will endeavour to reach a level of self-sufficiency within ten (10) years by generating income streams through the knowledge and capabilities developed on dam safety & rehabilitation in general and in the core areas of reservoir sedimentation and seismic hazard mapping and analysis in particular.

GS III: Environment & Ecology

HUBBLE TELESCOPE

1. Context

The Hubble Space Telescope, known for recording awe-inspiring images of the cosmos while advancing the field of astronomy, is under threat. Private companies are launching thousands of satellites that are photobombing the telescope producing long bright streaks and curves of light that can be impossible to remove.

2. About Hubble Space Telescope

- The Hubble Space Telescope is a large telescope in space.NASA launched Hubble in 1990.
- It was built by the United States space agency NASA, with contributions from the European Space Agency.
- Hubble is the only telescope designed to be serviced in space by astronauts.
- Expanding the frontiers of the visible Universe, the Hubble Space Telescope looks deep into space with cameras that can see across the entire optical spectrum from infrared to ultraviolet.
- The Hubble Space Telescope makes one orbit around Earth every 95 minutes.

3. Achievements

- It has helped in discovering the moons around pluto. Evidence regarding the existence of black holes has emerged based on observations through Hubble.
- The birth of stars through turbulent clouds of gas and dust has also been observed.
- The Hubble telescope made observations of six galaxies merging together.
- On February 11, 2021, Hubble made observations of small concentrations of black holes.

4. Images recorded by the Hubble are spoiled by passing satellites

- A study, published in the journal Nature Astronomy, reveals an increase in the percentage of images recorded by the Hubble that is spoiled by passing satellites.

- Thousands more satellites have been launched since then by SpaceX and other companies, and many more are expected to go into orbit in the years ahead, affecting the Hubble and potentially other telescopes in space.

5. Legacy of Hubble Space Telescope

- The Hubble Space Telescope's legacy cannot be overstated.
- Because of the observatory, we now know, for example, that the universe is 13.8 billion years old, that most galaxies contain a supermassive black hole at their centers, and that stars form in violent processes.
- The Hubble images including the gorgeous clouds of gas and dust in the "Pillars of creation" and the view of nearly 10,000 galaxies in the "Hubble ultra deep Field" never fail to inspire.
- But the number of satellites in orbit has significantly increased since the Hubble launched in 1990, and now it is staring at the cosmos through a field of satellites.

6. Findings of the study

- To quantify the effect of satellite constellations on Hubble, Sandor Kruk, an astronomer at the Max Planck Institute for Extraterrestrial Physics in Germany, and his colleagues analyzed an archive of images taken from 2002 through 2021.
- They had help from hundreds of citizen scientists who pored through images to tag those with clear satellite streaks.
- That data set was then used as a training set for a machine-learning algorithm that analyzed more than 100,000 individual Hubble photos.
- Their results show that the chance of seeing a satellite in a Hubble image from 2009 to 2020 is only 3.7 percent.
- But the chance of seeing one in 2021 is 5.9 percent an increase that they say corresponds to Starlink. By the date of the analysis, 1,562 Starlink satellites were in orbit. Another company, OneWeb, had lofted 320 satellites.

7. Threats posed by SpaceX Satellites

- The satellites could pose a serious threat to a telescope that hasn't launched yet.

- At the end of this year, China plans to send Xuntian, also known as the Chinese Survey Space Telescope, into low-Earth orbit.
- Xuntian will have a larger field of view than Hubble, making it much harder for satellites to slip by undetected.
- And Xuntian can't simply launch into a higher orbit. China's plan is for the telescope to share an orbit with the Tiangong space station so that astronauts can refurbish it if necessary.
- There are simply too many unknowns at the moment, including the ultimate number of satellites.
  SpaceX hopes to eventually expand the size of its fleet to 42,000 Starlink satellites.
- Many other companies are in the market, too: Amazon, the British satellite provider OneWeb, a Chinese company called Galaxy Space, and even governments.
- A combined 431,713 satellites are planned to launch in the coming years.

8. About SpaceX

- SpaceX is a commercial spaceflight company that launches satellites and sends astronauts to the International Space Station (ISS), including NASA astronauts. The company was founded in 2002 by Elon Musk to revolutionize space transportation, with the ultimate goal of making life multi-planetary.
- SpaceX designs manufacture and launch advanced rockets and spacecraft.
- It is the only private company ever to return a spacecraft from low-Earth orbit, which it first accomplished in December 2010.
- The company made history again in May 2012 when its Dragon spacecraft attached to the International Space Station, exchanged cargo payloads and returned safely to Earth a technically challenging feat previously accomplished only by governments.
- Since then Dragon has delivered cargo to and from the space station multiple times, providing regular cargo resupply missions for NASA.
- On May 30, 2020, SpaceX sent its first two humans to the International Space Station (ISS) onboard the SpaceX Crew Dragon and has since launched many additional crews on behalf of NASA and other organizations.

CORAL REEFS

1.Background

Coral reefs are essentially just big limestone structures built by thousands of tiny coral creatures called polyps. They're found in more than 100 countries, and just like pina coladas, they belong in tropical areas. But they're not looking too healthy
Increased ocean temperature caused by climate change is the main cause of coral bleaching events
That's when reefs expel the symbiotic algae responsible for their color. If that happens over longer periods, the corals can eventually die
The planet has already lost about half of its shallow water corals in in the past three decades. And at the current rate, up to 90% of them will disappear by the middle of the century
That really is a big deal, and not just because it would mean fewer BeReal posts from the Great Barrier Reef.

2.What are Coral reefs are good for

- Some 200 million people around the world depend on reefs to protect their coastal communities from storm surges and waves as flood protection
- Coral reefs act like low-crested breakwaters and absorb 97% of wave energy. This substantially reduces coastal flooding and erosion
- According to the United States Geological Survey, reefs help avert $1.8 billion in damage each year in areas like Florida, Hawaii and Puerto Rico

- And if those reefs lose just 1 meter in height, $5 billion in property and economic damage is at risk
- With coastal flooding predicted to worsen this century, reefs will play an even more important role
- Coral reefs cover less than 0.5% of the earth's surface, but they are home to about 25% of all marine species
- It provides planetary resilience, a vast resource of potential scientific discoveries, and is the result of millions of years of evolution
- Almost everything we know about coral reefs is based on those close to our shores, but most of them are distant, biodiverse hotspots in otherwise barren ocean basins, where they act as food bowls, rest stops, and even navigation waypoints for critters on the go
- Ignoring the intangible loss of heritage, allowing the destruction of these reefs is like burning the Great Library of Alexandria

3.Medicinal drugs

- A huge number of modern medicine's drugs are derived from natural sources. And so far, most of those have come from land organisms
- But given 80% of life is under water, researchers are increasingly looking to marine organisms to satisfy the need for novel chemicals and enzymes to build the pharmaceuticals of tomorrow
- Some estimates say the prospects of discovering a new drug in the sea, particularly in coral reefs, is hundreds of times more likely than finding one on land.
- The anticancer agent Ara-C, included on the World Health Organization's List of Essential Medicines, is found in sea sponges on a Caribbean reef
- One promising molecule, eleutherobin, that is believed to slow cancer cell growth is found in a common species of soft coral
- Scientists have been able to use its genetic code to figure out how they might soon be able to manufacture the chemical in large quantities
- Another success story from nature's medicine cabinet is trabectedin, found in the sea squirt Ecteinascidia turbinata, and used in chemotherapy

4.Way forward

Humans eat about 150 million tons of seafood a year and these fish have to breed somewhere.

Coral reefs provide shelter and function as nursery grounds for some pretty commercially important fish, like grouper and snapper, as well as invertebrates like the lobster

Some studies put the value of coral reef fisheries at $6.8 billion a year globally
About one billion people source their food or income directly from reefs
In countries like the Maldives, it provides people with 77% of their dietary animal protein. If managed well, reefs can continue providing this important source of food.
Potential food shortages could be the consequence. Especially when combined with failing crops from climate change
A study of reef damage in Kenya revealed drastic declines in key fish catches after a combination of factors in 1998 warmed the ocean by between 1-2 degrees Celcius
There a myriad of ways to protect reefs local restoration efforts by transplanting coral, the establishment of marine protection areas which work like national parks, and stopping run-off from agricultural and effluence

C V RAMAN

1.Context

In 1986, under then Prime Minister Rajiv Gandhi, the Government of India esignated February 28 as National Science Day to commemorate the announcement of the discovery of the “Raman Effect”. This year’s edition is being celebrated under the theme of “Global Science for Global Wellbeing”, in light of India’s G20 presidency.

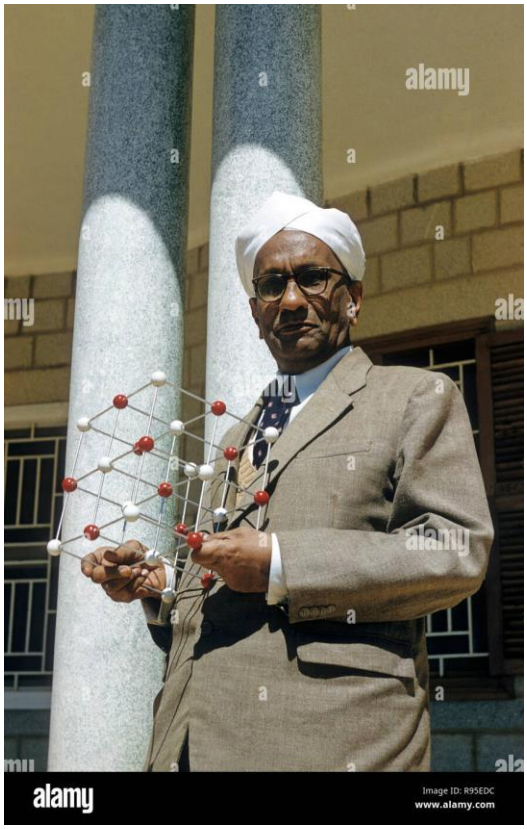


Image Source: Alamy

2.Background

The Raman Effect was the discovery which won physicist Sir CV Raman his Nobel Prize in 1930. Conducting a deceptively simple experiment, Raman discovered that when a stream of light passes through a liquid, a fraction of the light scattered by the liquid is of a different colour. This discovery was immediately recognised as groundbreaking in the scientific community, being the subject of over 700 papers in the first seven years after its announcement

3.About C.V. Raman

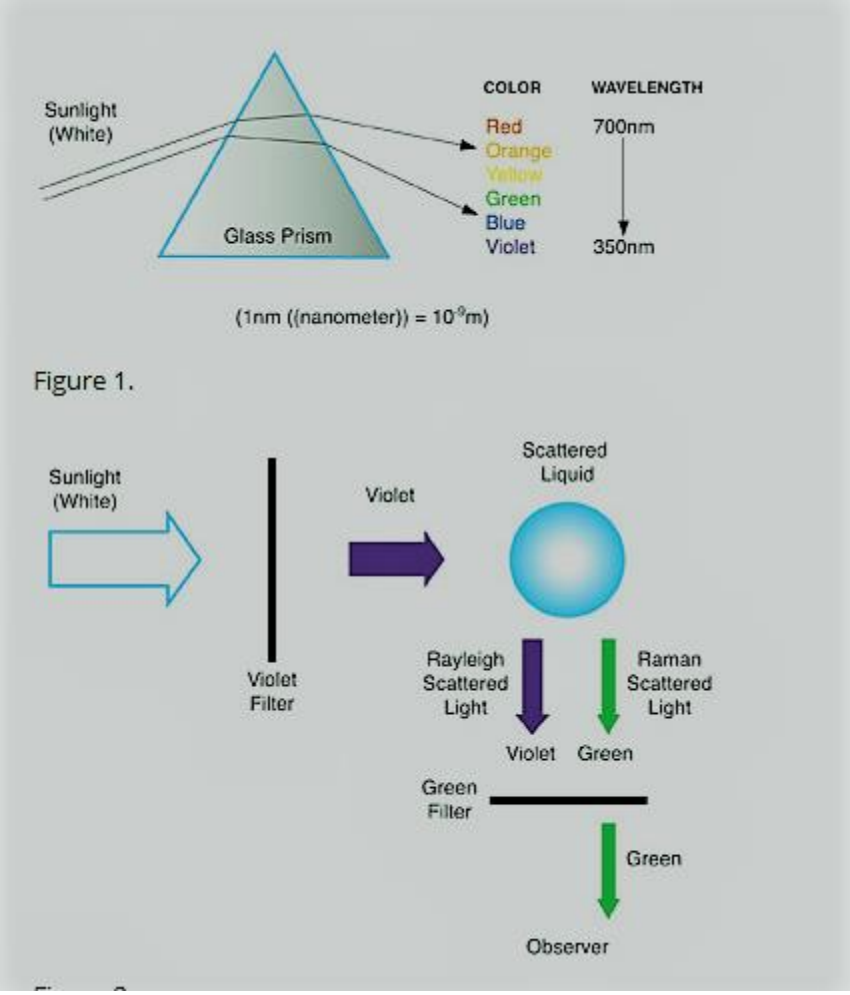
- Raman was born to a family of Sanskrit scholars in Trichy (present-day Tiruchirapalli) in the Madras Presidency in 1888
- At the age of only 16, He received a BA degree from Presidency College in Madras, and was placed first in his class
- While studying for his MA degree, at the age of 18, he got published in the Philosophical Magazine: this was the first research paper ever published by Presidency College
- Due to his ill health, he was unable to travel abroad for further education. Thus, in 1907, he got married and settled down in Calcutta as an assistant accountant general

- While still a full-time civil servant, Raman began after-hours research at the Indian Association for the Cultivation of Science (IACS)
- Raman raised the profile of IACS, doing some award-winning research as well as conducting public demonstrations with charisma
- At the age of 29, he finally resigned from his civil services job and took up a professorship in Presidency College, Calcutta
- By 1921, CV Raman had gained a solid reputation as a top scientific mind both in India and in the West
- That year, he made his first journey to England. It was on the return journey that Raman would make an observation that would change his life and science forever
- While passing through the Mediterranean Sea, Raman was most fascinated by the sea's deep blue colour
- He soon found out that the colour of the sea was the result of the scattering of sunlight by the water molecules
- Fascinated by the phenomenon of light-scattering, Raman and his collaborators in Calcutta began to conduct extensive scientific experiments on the matter experiments that would eventually lead to his eponymous discovery.

4.The Raman Effect

- Raman Effect refers to the phenomenon in which when a stream of light passes through a liquid, a fraction of the light scattered by the liquid is of a different colour
- This happens due to the change in the wavelength of light that occurs when a light beam is deflected by molecules.
- In general, when light interacts with an object, it can either be reflected, refracted or transmitted
- One of the things that scientists look at when light is scattered is if the particle it interacts with is able to change its energy
- The Raman Effect is when the change in the energy of the light is affected by the vibrations of the molecule or material under observation, leading to a change in its wavelength
- In their first report to Nature, titled "A New Type of Secondary Radiation," CV Raman and co-author KS Krishnan wrote that 60 different liquids had been studied, and all showed the same result – a tiny fraction of scattered light had a different colour than the incident light
- "It is thus," Raman said, "a phenomenon whose universal nature has to be recognised."

- Raman would go on to verify these observations using a spectroscope, publishing the quantitative findings in the Indian Journal of Physics on March 31, 1928



5.Importance of the Discovery

- CV Raman's discovery took the world by storm as it had deep implications far beyond Raman's original intentions
- As Raman himself remarked in his 1930 Nobel Prize speech, "The character of the scattered radiations enables us to obtain an insight into the ultimate structure of the scattering substance."
- For quantum theory, in vogue in the scientific world at the time, Raman's discovery was crucial
- The discovery would also find its use in chemistry, giving birth to a new field known as Raman spectroscopy as a basic analytical tool to conduct nondestructive chemical analysis for both organic and inorganic compounds

- With the invention of lasers and the capabilities to concentrate much stronger beams of light, the uses of Raman spectroscopy have only ballooned over time
- Today, this method has a wide variety of applications, from studying art and other objects of cultural importance in a non-invasive fashion to finding drugs hidden inside luggage at customs

ALMA TELESCOPE

1. Context

The Atacama Large Millimetre/submillimetre Array (ALMA) a radio telescope comprising 66 antennas located in the Atacama Desert of northern Chile is set to get software and hardware upgrades that will help it collect much more data and produce sharper images than ever before, the journal Science reported recently. It added that the upgrades would take around five years to finish and cost $37 million.

2. Recent Changes to ALMA

- The most significant modernization made to ALMA will be the replacement of its correlator, a supercomputer that combines the input from individual antennas and allows astronomers to produce highly detailed images of celestial objects.
- ALMA's correlators are among the world's fastest supercomputers. Over the next 10 years, the upgrade will double and eventually quadruple their overall observing speed.

3. Structure and Operation

- As ALMA is operated under a partnership among the United States, and 16 countries in Europe, Canada, Japan, South Korea, Taiwan, and Chile, the announcement came after all the partners cleared the funding required for the improvements.

- Fully functional since 2013, the radio telescope was designed, planned, and constructed by the US's National Radio Astronomy Observatory (NRAO), the National Astronomical Observatory of Japan (NAOJ), and the European Southern Observatory (ESO).
- Over the years, it has helped astronomers make groundbreaking discoveries, including that of starburst galaxies and the dust formation inside supernova 1987A.

4. What is ALMA?

- ALMA is a state-of-the-art telescope that studies celestial objects at millimetre and submillimeter wavelengths they can penetrate through dust clouds and help astronomers examine dim and distant galaxies and stars out there.
- It also has extraordinary sensitivity, which allows it to detect even extremely faint radio signals.
- As mentioned before, the telescope consists of 66 high-precision antennas, spread over a distance of up to 16km.
- Each antenna is outfitted with a series of receivers, and each receiver is tuned to a specific range of wavelengths on the electromagnetic spectrum.
- The antennas can be moved closer together or farther apart for different perspectives like the Zoom lens of a camera.
- The result is magnificent, never-before-seen imagery of the deepest darkest space.

5. Why is ALMA located in Chile's Atacama Desert?

- ALMA is situated at an altitude of 16,570 feet (5,050 metres) above sea level on the Chajnantor plateau in Chile's Atacama Desert as the millimetre and submillimetre waves observed by it are very susceptible to atmospheric water vapour absorption on Earth.
- Moreover, the desert is the driest place in the world, meaning most of the nights here are clear of clouds and free of light-distorting moisture making it a perfect location for examining the universe.
- For travelling from Japan, it takes 40 hours to get to the ALMA site in Chile including connection time. Despite such a long distance, the selected site is still the ultimate observing site on Earth with ideal conditions for the ALMA telescope.

6. Notable discoveries made by ALMA

- With ALMA's capability of capturing high-resolution images of gas and dust from which stars and planets are formed and materials that could be building blocks of life, scientists are trying to find answers to age-old questions of our cosmic origins.
- One of the earliest findings came in 2013 when it discovered starburst galaxies earlier in the universe's history than they were previously thought to have existed.
- These newly discovered galaxies represent what today's most massive galaxies looked like in their energetic, star-forming youth.
- Next year, ALMA provided detailed images of the protoplanetary disc surrounding HL Tauri a very young T Tauri star in the constellation Taurus, approximately 450 light-years from Earth and transformed the previously accepted theories about planetary formation.
- In 2015, the telescope helped scientists observe a phenomenon known as the Einstein ring, which occurs when light from a galaxy or star passes by a massive object en route to the Earth, in extraordinary detail.
- More recently, as part of the Event Horizon Telescope project, a large telescope array consisting of a global network of radio telescopes, it provided the first image of the supermassive black hole at the centre of our own Milky Way Galaxy. The image was unveiled by scientists in May 2022.

HIV

1. Context

A 53-year-old man from Germany referred to as the Dusseldorf patient, has become at least the third person to have been cured of HIV with the virus not being detectable in his body even four years after stopping the medicine.

This was achieved with a bone-marrow transplant from people carrying a specific HIV-resistant genetic mutation.

2. Recovered HIV Patients

- Referred to as the Berlin patient, Timothy Ray Brown became the first person to overcome HIV after he underwent two stem cell transplants in 2007 and 2008 for treating his blood cancer.

- As a person with HIV, his doctors selected a donor carrying two copies of a CCR5-delta 32 genetic mutation a mutation that is known to make the carriers almost immune to HIV.
- He remained HIV-free till his death due to cancer in 2020.
- Years later, researchers announced similar results in the London patient Adam Castillejo in 2019, replicating the treatment for the first time.
- The Dusseldorf patient, who also underwent a transplant for blood cancer, has remained free of HIV four years after he stopped taking antiretroviral that controls the level of the virus in the body.
- Two other cases of "The City of Hope patient" and "New York Patient" were also reported in 2022.
- The transplant in the New York Patient was done using a **dual stem cell therapy** using stem cells from the umbilical cord of a neonate, complemented with stem cells from the umbilical cord of a neonate, complemented with stem cells from an adult that requires less restrictive HLA matching.
- This is important as it may help people from different races get transplants with CCR5-delta 32 mutation, which is naturally found mostly in Europeans.

3. About CCR5 mutation and its fight off HIV

- HIV (Human Immunodeficiency Virus) mainly attacks the **CD4 immune cells** in the human body, thereby reducing a person's ability to fight off secondary infections.
- The CCR5 receptors on the surface of the CD4 immune cells act as a doorway for HIV.
- However, the CCR5-delta 32 mutation prevents these receptors used by the HIV from forming on the surface, effectively removing the doorway.

Only 1 per cent of the people in the world carry two copies of the CCR5 delta 32 mutations meaning they got it from both their parents and another 20 per cent carry one copy of the mutation, mainly those of European descent.

- Those with the mutation hence are almost immune to the infection, although some cases have been reported.

4. Can such transplants solve the HIV Crisis?

- With the mutation existing in very few people and nearly 38.4 million people living with HIV across the world, it would be very difficult to find a matching donor in the first place.
- Add to that the fact that the mutation occurs mainly among **Caucasians** and the donor pool shrinks further for many, especially those from countries with high HIV burden.
- However, even if donors were to become available, experts believe it is highly unlikely that bone marrow transplants can be rolled out for all those with HIV.
- This is because it is a major procedure with high risks associated, especially that of the person rejecting the donated marrow.
- There is also the likelihood of the virus mutating to enter the cells through other mechanisms in such persons.

5. Reasons for the Chinese researcher who edited this gene out face backlash

- A Chinese scientist called He Jiankui 2018 edited the genomes of twins Lulu and Nana to remove this CCR5 gene in an attempt to make them immune to HIV. Their father was living with HIV.
- A month after the first babies were born in October 2018, he announced that he had created the first genetically edited babies.
- He faced immediate backlash from the scientific community and legal action.

This is because guidelines for genetic editing prohibit germ-line editing, editing a genome that can be passed from one generation to the other as the editing techniques are not very precise and the long-term consequences of such editing are unknown.

- And antiretroviral therapy could anyway have prevented mother-to-child transmission of HIV.

6. Current treatments for HIV

- Although there are no cures for the infection at present, the disease can be managed using antiretroviral therapy.

- These medicines suppress the replication of the virus within the body, allowing the number of CD4 immune cells to bounce back.
- Although earlier the drugs were given only to those with low CD4 count under the government's programme, now the programme supports anyone who has been diagnosed with HIV.
- The drugs have to be taken for life because the virus continues to persist in reservoirs across the body.
- If the drugs are stopped, the virus can again start replicating and spreading.
- When the viral levels are low, the likelihood of a person transmitting the infection is also low.
- If left untreated, the virus destroys a person's immune system and they are said to be in the Acquired Immunodeficiency Syndrome stage (AIDS) where they get several opportunistic infections that may result in death.
- Although there is no vaccine for HIV, there are Pre-exposure prophylaxis (or PrEP) medicines that can be taken by people at high risk of contracting the infection.
- PrEP reduces the risk of getting HIV from sex by about 99 per cent.

DEMENTIA

1.Context

In 2022, the 67-year-old action movie star was diagnosed with aphasia — difficulty with language and speech

2.About Frontotemporal Dementia

- Frontotemporal dementia is an umbrella term for any disease that causes gradual loss of brain tissue in the frontal and temporal lobes the front and sides of the brain.
- Although relatively rare, it is one of the most common causes of dementia in people under the age of 65, accounting for around 40 per cent of early-onset cases.
- The condition which goes by other names, such as Pick’s disease, frontal dementia, semantic dementia and primary progressive aphasia tends to develop slowly, over several years.
- A build-up of abnormal proteins affects critical brain areas, leading to changes in behaviour, personality and speech.

- Unlike other forms of dementia, such as Alzheimer's disease, memory is often only affected later in the disease's progression

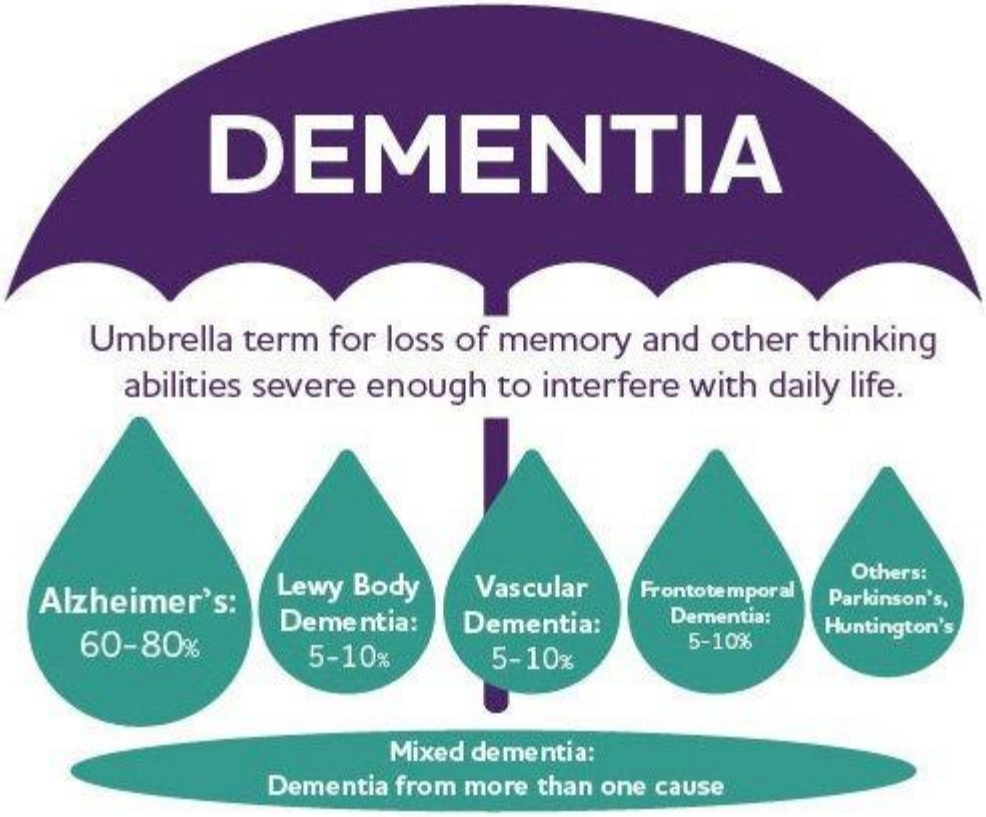
There are three different variants of frontotemporal dementia, Each of these will initially present differently and can be mistaken for other conditions.
1.The behavioural variant
2.Non fluent variant primary aphasia
3.Semantic variant primary aphasia

3.About Dementia

Dementia describes a group of symptoms associated with a decline in memory, reasoning, or other thinking skills. Many different types of dementia exist, and many conditions cause it. Mixed dementia is a condition in which brain changes of more than one type of dementia occur simultaneously. Alzheimer's disease is the most common cause of dementia, accounting for 60-80% of dementia cases.

Dementia is not a normal part of aging. It is caused by damage to brain cells that affect their ability to communicate, which can affect thinking, behavior, and feelings.

Worldwide, 50 million people are living with Alzheimer's and other dementias.



Source: FamilycaregiversOnline

4.Symptoms of the disease

- The earliest signs of the behavioural variant include changes in how a person acts, particularly in social situations
- They may become tactless or make rash decisions. Or they may behave inappropriately, for example, by making sexual advances
- Some may develop obsessive ritualistic behaviour, or lose all sense of empathy and caring.
- These symptoms reflect damage to the frontal lobes, an area of the brain involved in directing our behaviour, controlling our impulses, managing our emotions and generating speech and movement
- When they stop working, people tend to lack insight into their own behaviour or how they have changed
- Their relatives find it particularly hard because they can't have frank conversations with their loved ones as they can't see what the problem is

- Diagnosis can be difficult because these symptoms also occur in other conditions where the frontal lobes are injured, such as strokes and tumours, so a full medical history and brain scans play an important role
- To make things even more tricky for doctors, there is also significant overlap with several psychiatric disorders
- Example: depression, schizophrenia and obsessive-compulsive disorder.
- As the disease progresses, brain cells across the frontal and temporal lobes are destroyed. And, regardless of the variant, people will eventually experience many of the symptoms above
- This is accompanied by increasing difficulty with walking and moving. By the end, most struggle to eat and swallow
- Frontotemporal dementia is a devastating and life-changing disease for which we have no cure and little in the way of treatment
- For now, the focus is on managing symptoms and maximising quality of life. This may involve helping people develop ways to manage their emotions and behaviour, or drugs such as antidepressants and antipsychotics

In recent years, scientists have made progress in understanding more about which brain cells are being affected. One in eight sufferers will have frontotemporal dementia in the family, and important clues about the disease process are emerging from detailed analysis of the genetics

GS III: Environment & ecology

GLOBAL METHANE TRACKER 2023

1. Context

According to the International Energy Agency's (IEA) annual Methane Global Tracker report, fossil fuel companies emitted 120 million metric tonnes of methane into the atmosphere in 2022, only slightly below the record highs seen in 2019.

It added that these companies have done almost nothing to curb the emissions despite their pledges to find and fix leaking infrastructure.

2. Key Points

- The report said 75 per cent of methane emissions from the energy sector can be reduced with the help of cheap and readily available technology.
- The implementation of such measures would cost less than three per cent of the net income received by the oil and gas industry in 2022, but fossil fuel companies failed to take any substantial action regarding the issue.
- The energy sector accounts for around 40 per cent of the total average methane emissions from human activity, as oil and natural gas companies are known to release methane into the atmosphere when natural gas is flared or vented.
- The greenhouse gas is also released through leaks from valves and other equipment during the drilling, extraction and transportation process.
- More than 260 billion cubic metres (bcm) of natural gas (mostly composed of methane) is wasted through flaring and methane leaks globally today.
- Although it is impossible to avoid all of this amount, the right policies and implementation can bring 200 bcm of additional gas to markets.
- In the oil and gas sector, emissions can be reduced by over 75 per cent by implementing well-known measures such as leak detection and repair programmes and upgrading leaky equipment.
- It further mentioned that 80 per cent of the available options to curb the release of methane could be implemented by the fossil fuel industry at net zero cost.
- Based on average natural gas prices from 2017 to 2021, estimate that around 40 per cent of methane emissions from oil and gas operations could be avoided at no net cost because the outlays for the abatement measures are less than the market value of the additional gas that is captured.
- Ultimately reducing 75 per cent of the wastage of natural gas could lower global temperature rise by nearly 0.1 degree Celsius by mid-century.
- This would have the same effect on the soaring global temperatures as immediately stopping greenhouse gas emissions from vehicles such as cars, trucks, buses and two and three-wheeler vehicles across the world.
- However, fossil fuel companies have done little to tackle the problem.

3. About Methane

- Methane is a greenhouse gas, which is responsible for 30 per cent of the warming since preindustrial times, Second only to carbon dioxide.
- A report by the United Nations Environment Programme observed that over 20 years, methane is 80 times more potent at warming than carbon dioxide.

- There are various sources of methane including human and natural sources.
- Human sources of methane include landfills oil and natural gas systems, agricultural activities, coal mining, wastewater treatment and certain industrial processes.
- The oil and gas sectors are among the largest contributors to human sources of methane.
- NASA notes that human sources (also referred to as anthropogenic sources) of methane are responsible for 60 per cent of global methane emissions.
- These emissions come primarily from the burning of fossil fuels, decomposition in landfills and the agriculture sector.

In India, for instance, in 2019, the Ministry of Coal asked state-run coal miner Coal India Limited (CIL) to produce 2 MMSCB (Million metric standards cubic metres) per day of coalbed Methane (CBM) gas in the next 2 to 3 years.

- CBM, like shale gas, is extracted from what is known as unconventional gas reservoirs where gas is extracted directly from the rock that is the source of the gas (Shale in the case of shale gas and coal in the case of CBM).
- The methane is held underground within the coal and is extracted by drilling into the coal seam and removing the groundwater.
- The resulting drop in pressure causes methane to be released from the coal.
- In recent years, scientists have repeatedly sounded the alarm regarding the increasing amount of methane in the atmosphere. The US National Oceanic and Atmospheric Administration (NOAA) said that the atmospheric levels of methane jumped 17 parts per billion in 2021, beating the previous record set in 2020.
- While carbon dioxide remains in the atmosphere for much longer than methane, is roughly 25 times more powerful at trapping heat in the atmosphere and has an important short-term influence on the rate of climate change.

4. Global Methane Pledge

- The pledge was first announced by the US and EU and is essentially an agreement to reduce global methane emissions.
- One of the central aims of this agreement is to cut down methane emissions by up to 30 per cent from 2020 levels by the year 2030.

- Methane accounts for about half of the 1.0 degrees Celsius net rise in the global average temperature since the pre-industrial era.

5. About MARS

- In keeping with the relatively new focus on cutting methane emissions, the UN has decided to set up a satellite-based monitoring system for tracking it and alerting governments and corporations to respond.
- The Methane Alert and Response System, or MARS will integrate data from a large number of existing and future satellites that can detect methane emission events anywhere in the world and send out notifications to the relevant stakeholders to act on it.
- In the last few years, there has been a lot of emphasis on reducing methane emissions.
- Methane is the second-most common of the six major greenhouse gases but is far more dangerous than carbon dioxide in its potential to cause global warming.
- Accounting for about 17 per cent of the current global greenhouse gas emissions, methane is blamed for having caused at least 25 to 30 per cent of temperature rise since the pre-industrial times.
- However, unlike carbon dioxide, methane is largely a sectoral gas and there are only a few sources of emission.
- It is possible, therefore, to cut down on methane emissions without having a widespread impact on the economy. Because its global warming potential is about 80 times that of carbon dioxide, a reduction in methane emissions also brings big benefits in a short time.
- At the Glasgow climate conference, nearly 100 countries had come together in a voluntary pledge now referred to as the Global Methane Pledge to cut methane emissions by at least 30 per cent by 2030 from the 2020 levels.
- More countries have joined this initiative since then, bringing the total to nearly 130.
- A 30 per cent reduction in methane emissions by 2030 is expected to result in avoiding 0.2 degrees rise in temperature by the year 2050 and is considered essential in the global efforts to keep the temperature increase below the 1.5 degree Celsius target.

6. The MARS initiative is intended to strengthen these efforts.

- It would feed into the recently formed International Methane Emissions Observatory of the UN Environment Programme.

- To start with, MARS will track the large-point emission sources, mainly in the fossil fuel industry, but with time, would be able to detect emissions from coal, waste, livestock and rice fields as well.
- US announced among other things, a proposal to strengthen domestic standards to reduce methane emissions from the oil and gas sector by 87 per cent from 2005 levels.

7. Global Methane Initiative

- The Global Methane Initiative (GMI) is an international public-private partnership focused on reducing barriers to the recovery and use of methane as a valuable energy source.
- It provides technical support to deploy methane-to-energy projects around the world that enable Partner Countries to launch methane recovery and use projects.
- GMI focuses on three key sectors: Oil and Gas, Biogas and Coal Mines.

8. About Harit Dhara

- The Harit Dhara developed by the Indian Council of Agricultural Research, through comprehensive research over a decade is an anti-methanogenic feed supplement prepared from natural phyto-sources.
- It is found very effective in reducing enteric methane emissions by up to 17 to 20 per cent when incorporated in livestock feed.
- The partial inhibition of enteric methanogenesis will have the dual advantage of stabilizing the global warming process and enhancing productivity by re-channelizing the saved biological energy.

9. Cows and other animals produce methane

- Ruminant species are hooved grazing or browsing herbivores that chew the cud.
- Ruminants such as cows, sheep, goats and buffaloes have a special type of digestive system that allows them to break down and digest food that non-ruminant species would be unable to digest.
- Stomachs of ruminant animals have four compartments, one of which, the rumen, helps them to store partially digested food and let it ferment.
- This partially digested and fermented food is regurgitated by the animals who chew through it again and finish the digestive process.

- However, as grass and other vegetation ferments in the rumen, it generates methane, a potent greenhouse gas.
- Ruminant animals such as cows and sheep release this methane mainly through burping.
- Given the very large numbers of cattle and sheep on farms in dairy-producing countries, these emissions add up to a significant volume.
- It is estimated that the ruminant digestive system is responsible for 27 per cent of all methane emissions from human activity.

10. Impact of Methane on Climate Change

- Methane is one of the main drivers of climate change, responsible for 30 per cent of the warming since preindustrial times, second only to carbon dioxide.
- Over 20 years, methane is 80 times more potent at warming than carbon dioxide, according to a United Nations Environment Programme report.
- It is also the primary contributor to the formation of ground-level ozone, a colourless and highly irritating gas that forms just above the Earth's surface.
- According to a 2022 report, exposure to ground-level ozone could contribute to 1 million premature deaths yearly.
- Several studies have shown that the amount of methane in the atmosphere has dramatically shot up in recent years.
- In 2022, the US National Oceanic and Atmospheric Administration (NOAA) said that the atmospheric levels of methane jumped 17 parts per billion in 2021, beating the previous record set in 2020.
- While carbon dioxide remains in the atmosphere for much longer than methane, methane is roughly 25 times more powerful at trapping heat in the atmosphere and has an important short-term influence on the rate of climate change.

11. Mitigation of methane emissions

- Rumin8 is not the first to find a dietary solution to curb methane emissions from ruminant species.
- Scientists have been working on it for quite some time now, as they are looking to make these animals more sustainable and less gassy.
- A 2021 study, published in the journal PLUS ONE, found that adding seaweed to a cow the feed can reduce methane formation in their guts by more than 80 per cent.
- Apart from this, researchers are also trying to find gene-modifying techniques to curtail methane emissions in these animals.

12. New Zeland's genetic programme

- Last year, scientists in New Zealand announced they had started the world's first genetic programme to address the challenge of climate change by breeding sheep that emit lower amounts of methane.
- New Zealand is also one of the first nations to come up with policy-related solutions to this problem.
- In October 2022, it proposed taxing the greenhouse gases that farm animals produce from burping and urinating

FOREST CERTIFICATION

1. Context

The large-scale destruction of forests has always been a concern for the environment, but with climate change, deforestation has become a critically sensitive issue globally in recent years.

2. Key points

- Forests absorb large amounts of carbon dioxide that is emitted in various economic activities, keeping a check on global warming.
- At the **Glasgow climate meeting** in 2021, more than 100 countries took a pledge to stop and start reversing, deforestation by 2030.
- Several countries and corporates, keen to present an environment-friendly image, now try to ensure that they avoid the consumption of any product that might be the result of deforestation or illegal logging.
- And Europe and the United States have passed laws that regulate the entry and sale of forest-based products in their markets.
- This is where the certification industry comes in offering a multi-layer audit a system that seeks to authenticate the origin, legality and sustainability of forest-based products such as timber, furniture, handicraft, paper and pulp, rubber and many more.

3. Sustainability and Certifications

- Stopping deforestation does not mean forests cannot be harvested in a sustainable manner for the products.
- Periodic harvesting of trees is necessary and healthy for forests. Trees have a life span, beyond which they die and decay.

- Also, after a certain age, the capacity of trees to absorb carbon dioxide gets saturated.
- Younger and fresher trees are more efficient at capturing carbon dioxide.
- The problem arises only when trees are felled indiscriminately and the cutting of forests outpaces their natural regeneration.
- The approximately three-decade-old global certification industry began as a way to establish, through independent third-party audits, whether forests were being managed sustainably.
- Over the years, a range of certifications has come to be offered for various activities in the forestry sector.

There are two major international standards (there are a few other less widely accepted ones as well) for sustainable management of forests and forest-based products.

1. Forest Stewardship Council or FSC;
2. The Programme for Endorsement of Forest Certifications or PEFC.

- FSC certification is more popular and in demand and also more expensive.

3.1.Organisations

- Organisations like **FSC or PEFC** are only the developers and owners of standards like, for example, the International Organisation of Standardisation (ISO) or the Bureau of International Standards (BIS).
- They are not involved in the evaluation and auditing of the processes being followed by the forest managers or manufacturers or traders of forest-based products.
- That is the job of certification bodies authorised by the FSC or PEFC.
- The certification bodies often subcontract their work to smaller organisations.
- PEFC does not insist on the use of its standards.
- Instead, as its name suggests, it endorses the "**national**" standards of any country if they are aligned with its own.
- Two main types of certification are on offer:

1. Forest management (FM) and
2. Chain of Custody (CoC).

- CoC certification is meant to guarantee the traceability of a forest product like timber throughout the supply chain from origin to market.

4. Forest certification in India

- The forest certification industry has been operating in India for the last 15 years.
- Currently, forests in only one state Uttar Pradesh are certified.
- Forty-one divisions of the UP Forest Corporation (UPFC) are PEFC-certified, meaning they are being managed according to standards endorsed by PEFC.
- These standards have been developed by the New Delhi-based nonprofit **Network for Certification and Conservation of Forests** (NCCF).
- Some other states too obtained certification, but subsequently dropped out. The Bhamragad forest division in Maharashtra was the first to obtain FSC certification for forest management.
- Later, two divisions in Madhya Pradesh and one in Tripura also obtained FSC certification.
- UPFC too had FSC Certification earlier.
- However, all of these expired over time. Only UPFC extended its certification but with PEFC.
- Many agroforestry projects such as those run by ITC and several paper mills too have forest management certification.
- The forests here are meant for captive use of the industry.
- There are a large number of CoC Certifications, but the dropout rate is 40 per cent.
  As of now, there are 1, 527 valid CoC certifications by FSC and 1, 010 that are suspended, expired or have been terminated.

5. India-specific standards

- India allows the export of only processed wood, not timber.
- The timber harvested from Indian forests is not enough to meet the domestic demand for housing, furniture and other products.
- The demand for wood in India is 150-170 million cubic meters annually, including 90-100 million cubic metres of raw wood.
- The rest goes mainly towards meeting the demand for paper and pulp.
- India's forests contribute just about five million cubic metres of wood every year.

- Almost 85 per cent of the demand for wood and wood products is met by **trees outside forests** (ToF).
- About 10 per cent is imported. India's wood import bill is Rs 50, 000 -60, 000 crores per year.
- Since ToF is so important, new certification standards are being developed for their sustainable management.
- PEFC already has certification for TOF and last year, FSC came up with India-Specific standards that included certification for ToF.
- Environment Ministry launched the FSC's India standards in June 2022.

6. The Government's standards

- Long before private certification bodies set up operations in India, the government had moved to define national standards for the management of forests.
- Based on the recommendations of an expert committee in 2005, the Environment Ministry had asked relevant institutions like the Bhopal-based Indian Institute of Forest Management to draw up national forest standards.
- Considerable work was done and a draft cabinet note seeking the government's approval for setting up such standards was drawn up. However, the effort did not come to fruition.
- When the NCCF came into being in 2015, offering PEFC certification in India, the Environment Ministry nominated an officer on the governing board, lending it official legitimacy.
- But the nomination was later withdrawn. Last year, the Ministry associated itself with FSC, by launching its new India standards.
- The role of private certification agencies, especially in forest management certification has come under sustained criticism from a group of influential retired forest officials.
- In response to this criticism and also to the increasing complaints about corruption in the private certification space, the Ministry has restarted efforts to develop official national forest standards.
- The government says the "**indigenous system of certifications**" will be simple, transparent and easy to adopt, even by small farmers and tree growers.
- The benchmarks will adhere to internationally accepted norms but will take into account India's national circumstances.
- The purpose is to make available sustainably grown and managed forest products in the domestic market.

IEA's ANNUAL REPORT

1. Context

According to the International Energy Agency's (IEA) annual Methane Global Tracker report, fossil fuel companies emitted 120 million metric tonnes of methane into the atmosphere in 2022, only slightly below the record highs seen in 2019.

It added that these companies have done almost nothing to curb the emissions despite their pledges to find and fix leaking infrastructure.

2. Key Points

- The report said 75 per cent of methane emissions from the energy sector can be reduced with the help of cheap and readily available technology.
- The implementation of such measures would cost less than three per cent of the net income received by the oil and gas industry in 2022, but fossil fuel companies failed to take any substantial action regarding the issue.
- The report has come just weeks after energy giants such as Shell, BP, ExxonMobil and others reported record profits last year as the Russia-Ukraine war drove up oil and natural gas prices.
- **The New Global Methane Tracker** shows that some progress is being made but that emissions are still far too high and not falling fast enough especially as methane cuts are among the cheapest options to limit near-term global warming. There is just no excuse.

3. Findings of the report

- The energy sector accounts for around 40 per cent of the total average methane emissions from human activity as oil and natural gas companies are known to release methane into the atmosphere when natural gas is flared or vented.
- The greenhouse gas is also released through leaks from valves and other equipment during the drilling, extraction and transportation process.
- More than 260 billion cubic metres (bcm) of natural gas (mostly composed of methane) is wasted through flaring and methane leaks globally today.
- Although it's impossible to avoid all of this amount, the right policies and implementation can bring 200 bcm of additional gas to markets.

- In the oil and gas sector, emissions can be reduced by over 75 per cent by implementing well-known measures such as leak detection and repair programmes and upgrading leaky equipment.
- It further mentioned that 80 per cent of the available options to curb the release of methane could be implemented by the fossil fuel industry at net zero cost.

Based on average natural gas prices from 2017 to 2021, estimate that around 40 per cent of methane emissions from oil and gas operations could be avoided at no net cost because the outlays for the abatement measures are less than the market value of the additional gas that is captured.

- Ultimately, reducing 75 per cent of the wastage of natural gas could lower global temperature rise by nearly 0.1 degree Celsius by mid-century.
- This would have the same effect on the soaring global temperatures as immediately stopping greenhouse gas emissions from vehicles such as cars, trucks, buses and two and three-wheeler vehicles across the world.
- However, fossil fuel companies have done little to tackle the problem.
- Unfortunately, it is not a new issue and emissions remain stubbornly high.
- Many companies saw hefty profits last year following a turbulent period for international oil and gas markets amid the global energy crisis.
- Fossil fuel producers need to step up and policymakers need to step in and both must do so quickly.

4. Methane emissions driving climate change

- Methane is a greenhouse gas, which is responsible for 30 per cent of the warming since preindustrial times, second only to carbon dioxide.
- A report by the United Nations Environment Programme observed that over 20 years, methane is 80 times more potent at warming than carbon dioxide.
- In recent years, scientists have repeatedly sounded the alarm regarding the increasing amount of methane in the atmosphere.
- Last year, the **US National Oceanic and Atmospheric Administration (NOAA)** said that the atmospheric levels of methane jumped 17 parts per billion in 2021, beating the previous record set in 2020.
- While carbon dioxide remains in the atmosphere for much longer than methane, methane is roughly 25 times more powerful at trapping heat in the atmosphere and has an important short-term influence on the rate of climate change.

WHALE STRANDING

1. Context

Recently, 14 pilot whales were stranded near the shore of Kalpitiya, a town located on Sri Lanka's west coast.

With the help of a navy team and local fishermen, 11 of them were rescued but three died.

2. Key points

- The stranded pilot whales had to be taken into the deeper seas so that they would not come back to the shore. The navy took them in their boats and dropped them.
- Whale strandings are not uncommon in Sri Lanka. In 2020, the country witnessed one of the biggest whale strandings in recent history when more than 100 pilot whales beached on the western coast of Panadura. Three of them died during the rescue operations.
- In 2017, around 20 pilot whales were stranded on the eastern coast before being saved by the navy and local fishermen.

Apart from Sri Lanka, Australia's Tasmania has also seen mass beaching of whales.

Last year in September, more than 230 pilot whales were stranded on the west coast of the region. Around 170 of them died even before the rescuers arrived at the spot.

3. About whale stranding

- Whale stranding is a phenomenon in which whales are stuck on land, usually on a beach.
- Other aquatic animals like dolphins and porpoises are also known as beaches.
- Most of the stranding events involve single animals but sometimes, mass strandings, consisting of hundreds of marine animals at a time, can happen.

4. Reasons for the Whale Stranding

- Although mass strandings have been occurring since the times of Aristotle back then, they were considered a gift from the gods as the stranded whales and dolphins were a rich source of food and oil experts don't know exactly why they take place.
- The reasons for mass strandings are several, including the topography of the region, illness, human activities and increasing noise pollution in the oceans.
- Among the major hotspots for the beaching of aquatic animals are Tasmania, New Zealand's Golden Bay and Massachusetts's Cape Cod in the United States.
- These areas witness several instances of stranding possibly because the deep water here quickly becomes shallow due to tidal variations.

4.1.Human activities causing whale strandings

- Experts believe that mass strandings could be becoming more common as the health of oceans continues to deteriorate due to human interference.
- One of the prime reasons for such incidents could be an increase in noise pollution in the oceans.
- According to a report published by Mongabay, the latest whale beaching event in Sri Lanka might have been caused due to the "recent seismic activity in the Indian Ocean".

- Several studies have shown that noise from large commercial ships, military sonars or offshore drilling severely impacts whales and other marine animals' ability to use sound to navigate, find food and protect themselves.
- This can drive them ashore by deafening, disorienting or frightening them.
- For some noise pollution can reduce the available speak to talk to each other. It becomes too loud.
- For others, it might be a sudden sound that spooks individuals, causing them to rise from the depths at speed.
- Another factor could be the rising temperatures of the oceans that cause changes in prey and predator distribution, resulting in whales coming closer to shore.
- Whales and dolphins often travel where there is food. Changes in prey movements due to environmental changes like sea temperature and currents may play a role in where whale and dolphin food is located.

5. Prevention of mass strandings

- It's very difficult to prevent them. Also as strandings happen due to several reasons, no one-size-fits-all solution would work.
- However, "taking more care of our actions in the ocean to try and minimise human activities which might impact marine life" might help reduce the chances of such incidents.

GREAT ANDAMAN NICOBAR

1. Context

Recently, the Ministry of Environment, Forest and Climate Change gave environmental clearance for the ambitious Rs 72, 000 crores development project on the strategically important Great Nicobar Island.

The project is to be implemented in three phases over the next 30 years.

2. The proposal for a greenfield city

- A greenfield city has been proposed including an International Container Transhipment Terminal (ICTT), a greenfield international airport, a power plant and a township for the personnel who will implement the project.

- The proposed port will allow Great Nicobar to participate in the regional and global maritime economy by becoming a major player in cargo transhipment.
- The port will be controlled by the Indian Navy, while the airport will have dual military-civilian functions and will cater to tourism as well.
- Roads, public transport, water supply and waste management facilities and several hotels have been planned to cater to tourists.

A total of 166.1 sq km along the southeastern and southern coasts of the island have been identified for the project along a coastal strip of width between 2 km and 4 km.

Some 130 sq km of forests have been sanctioned for diversion and 9.64 lakh trees are likely to be felled.

- Development activities are proposed to commence in the current financial year and the port is expected to be commissioned by 2027-28.
- More than 1 lakh new direct jobs and 1.5 lakh indirect jobs are likely to be created on the island throughout development.

3. About the Island

- Great Nicobar, the southernmost of the Andaman and Nicobar Islands, has an area of 910 sq km.
- The Andaman and Nicobar Islands are a cluster of about 836 islands in the eastern Bay of Bengal, the two groups of which are separated by the 150 km wide T**en Degree Channel**.
- The Andaman Islands lie to the north of the channel and the Nicobar Islands to the South.
- **Indira Point** on the Southern tip of Great Nicobar Island is India's southernmost point, less than 150 km from the northernmost island of the **Indonesian archipelago.**
- Great Nicobar is home to two national parks, and a biosphere reserve and the **Shompen and Nicobarese tribal peoples**, along with ex-servicemen from Punjab, Maharashtra and Andhra Pradesh were settled on the island in the 1970s.

4. Shompen

- The Shompen are hunter-gatherers who depend on forest and marine resources for sustenance.
- The Nicobarese, who lived along the west coast of the island mostly relocated after the 2004 tsunami.
- An estimated 237 Shompen and 1,094 Nicobarese individuals now live in a 751 sq km tribal reserve 84 sq km of which is proposed to be denotified.
- The approximately 8, 000 settlers who live on the island are engaged in agriculture, horticulture and fishing.

The Great Nicobar Island has tropical wet evergreen forests, mountain ranges reaching almost 650m above sea level and coastal plains.

Fourteen species of mammals, 71 species of birds, 26 species of reptiles, 10 species of amphibians and 113 species of fish are found on the island some of which are endangered.

The **leatherback sea turtle** is the island's flagship species.

5. The purpose

- The island has a lot of tourism potential, but the government's greater goal is to leverage the locational advantage of the island for economic and strategic reasons.
- Great Nicobar is equidistant from Colombo to the southwest and Port Klang and Singapore to the southeast and positioned close to the East-West international shipping corridor, through which a very large part of the world's shipping trade passes.
- The proposed ICTT can potentially become a hub for cargo ships travelling on this route.
- The proposal to develop Great Nicobar was first floated in the 1970s and its importance for national security and consolidation of the Indian Ocean Region has been repeatedly underlined.
- Increasing Chinese assertion in the Bay of Bengal and the Indo-Pacific has added great urgency to this imperative in recent years.

6. The concerns

- The proposed massive infrastructure development in an ecologically important and fragile region, including the feeling of almost a million trees, has alarmed many environmentalists.
- The loss of tree cover will not only affect the flora and fauna on the island, but it will also lead to increased runoff and sediment deposits in the ocean, impacting the coral reefs in the area, they have cautioned.
- Coral reefs, already under threat from warming oceans are of enormous ecological importance.
- Environmentalists have also flagged the loss of mangroves on the islands as a result of the development project.
- India successfully translocated a coral reef from the Gulf of Mannar to the Gulf of Kutch earlier.
- **The Zoological Survey of India** is currently in the process of assessing how much of the reef will have to be relocated for the project.
- The government has said that a conservation plan for the leatherback turtle is also being put in place.
- According to the government, expediting the project is of paramount national security and strategic importance.
- Officials said that after the grant of **stage I** clearance on October 27, all aspects will be carefully weighed before final approval is granted.
- The project site is outside the eco-sensitive zones of **Campbell Bay and Galathea National Park**.
- The Centre has said that the development area is only a small percentage of the area of the island and its forest cover and that 15 per cent of the development area itself will be green cover and open spaces.

PROTECTING OCEAN SYSTEM

1.Context

While the high seas make up more than 60% of the world's oceans, they have long drawn far less attention than coastal waters. The UN wants to protect them in a global treaty

2.Key takeaways

- Fishing, shipping, tourism and ocean protection are currently controlled by around 20 organizations.
- However, their regulations only apply to a distance of 200 nautical miles (370 kilometers) from the coast. Farther out, international waters start, and individual states don't have any power or say
- Although the high seas make up more than half of the surface of the Earth and 61% of all oceans, only 1% of international waters are under the protection
- Although the high seas make up more than half of the surface of the Earth and 61% of all oceans, only 1% of international waters are under the protection
- Illegal fishing, overfishing and other forms of damage to the ecosystem, such as deep-sea mining, oil and gas drilling, can hardly be monitored, tracked or prosecuted in a consistent way
- The treaty has been in the works for years and is supposed to protect species and allocate the oceans' resources in a sustainable way

3.Importance of healthy underwater

- The resources of the ocean don't just sustain coast dwellers, but almost 3 billion people worldwide
- The entire sea industry has a worth of $3 trillion (€2.8 trillion) — that's 5% of the world's gross domestic product
- The ocean isn't just important for beach tourists and fishers. We also need it in order to generate sustainable wave and tidal energy, as well as for the production of commodities and even medicine
- Some agents used to fight leukemia, for instance, are derived from a shallow water sponge called Tectitethya crypta, which can be found in the waters of the Caribbean
- The poison of the fish-eating sea snail Conus magus is being used to develop an effective painkiller
- Many similar possibilities have yet to be explored, but scientists see a huge potential for the treatment of diseases

4. Climate change for Oceans

- More than half of the total amount of oxygen in our atmosphere is created by creatures in the ocean
- At the same time, oceans store 50 times more carbon dioxide than what's currently found in our atmosphere

- The warmer the ocean gets, the less CO2 it can store
- It's a vicious cycle: the warmer it gets, the less our oceans can protect the planet from even more extreme weather events
- If temperatures keep increasing at their current speed, scientists believe many shellfish such as mussels and snails will not survive
- That's due to ocean acidification: if the CO2 content in the seawater increases, the PH level in the water changes
- The increasing acidity hampers the creation of the chalky shells of the animals
- This throws entire biospheres off-balance, and could threaten entire economic sectors, such as the breeding of oysters and mussels
- The rising temperatures in the atmosphere triggered by the burning of coal, oil and gas also change ocean currents as the water gets warmer
- This can already mean death for many creatures, such as corals
- Corals live in symbiosis with colorful algae which help feed them
- The warming of the water can lead to algae death, which means more stress for corals, leading to many losing their color, which is also known as coral bleaching

5.Protecting Ocean systems

- If nothing changes, half of all sea dwellers will be critically endangered by the end of this century, according to estimates by UNESCO
- This doesn't necessarily mean we can't use the ocean any longer
- It just means we have to use it in a way that doesn't harm it, or at least only harms it to the extent that it can regenerate on its own
- Every year, we toss away 10 million tons of fish that could fill more than 4,500 swimming pools because of bad fishing practices and processing
- This could be prevented, and in turn directly decrease pressure on our oceans
- Another example: sewage. Around 80% of global wastewater is currently being diverted into oceans, unfiltered. In the poorest countries of the world it's even up to 95%
- This wastewater pollutes, contaminates and destroys oceans and coastal regions
- Building sustainable sewage systems, especially in developing countries, would protect ocean ecosystems and contribute to better drinking water supplies in many places
- According to the UN's environment program, international treaties are one of the best ways to stop the destruction of oceans

- Many treaties have been signed in recent years regarding the protection of coastal regions
- Some have already had a positive effect on the environment; many, however, have not been able to reach their goals
- That has to do with the fact that agreements are always dependent on national parliaments turning them into laws, and allocating enough resources to institutions and projects so the goals can be reached
- The EU is pushing for an ambitious new treaty for species protection and the implementation of the historic 2022 Kunming-Montreal Global Biodiversity Framework
- Part of this historic agreement is to put 30% of the globe under protection until 2030
- Meanwhile, 18 developing and emerging nations are pushing for the introduction of a mechanism that guarantees the fair distribution of ocean resources

INDIA'S TARGETS ON CLIMATE CHANGE

1. Context

Speaking at the UN climate conference in Glasgow earlier this week, Prime Minister Narendra Modi shortened the timeline on the country's existing climate targets and announced a few new targets as well. Modi's announcements underline India's commitment to the fight against climate change and importantly, none of the targets are likely to be too difficult to achieve.

2. Net-zero

- The five-point target announced by Modi is to achieve net-zero emission status by 2070 is the one with the least clarity as of now.
- This is because this promise seems to have been made primarily to satisfy the international demand.
- At the same time, 2070 is a long way away and there is plenty of time to plan a roadmap to achieve that target.

- The other four targets have to be achieved in a much more immediate timeframe, by 2030.

3. Emissions intensity and Renewables

- Two of these, which are about reducing emissions intensity and increasing the renewable mix in electricity generation, are already part of India's official climate action plan, called the Nationally Determined Contributions or NDCs, that have been submitted as part of the requirement under the Paris Agreement.
- In that NDC, submitted in 2015, India had promised to reduce its 'emissions intensity', or emissions per unit of GDP, by 33 percent to 35 percent from 2005 levels by the year 2020.
- Also, India had said it would ensure that at least 40 percent of its installed capacity of electricity generation in the year 2030 would come through non-fossil-fuel-based energy sources.
- The emissions intensity reduction target has been raised to 45 percent, and the share of renewables in installed electricity capacity has been increased to 50 percent.
- India was already on course to achieve both these existing targets well before the 2030 deadline.

4. Forest Cover

- The third promise made in India's NDC, about the increase in forest cover, did not find a mention in Modi's speech in Glasgow. And that is the only target that India is struggling to achieve.
- In the NDC, India has promised to create an additional carbon sink of 2.5 billion to 3 billion tonnes of carbon dioxide equivalent through forest and tree cover by the year 2030.
- According to official data, India's forest cover has been growing, and the pace of growth as of now is far from being commensurate with what is required to achieve the target.

5. Halfway to achieving non-fossil fuel targets already

- The two other announcements made by Modi, about raising the installed capacity of renewable energy, and an absolute reduction of 1 billion tonnes of carbon dioxide by 2030, are not part of India's existing commitments but are nonetheless linked.

- India had initially set out to install 20 GW of solar power capacity by the year 2020. That was later raised to 100 GW by 2022.
- Targets for wind and biogas were subsequently added, making it a renewable energy power capacity target of 175 GW for the year 2022.
- Two years ago, Modi enhanced this to 450 GW for the year 2030. None of this was ever part of the NDC, though. These were publicly announced targets that India had set for itself.

6. Absolute reduction in emissions

- The PM said India would ensure that it reduces 1 billion tonnes of emissions from its projected emissions between now and 2030.
- This is the first time that India has talked about making a reduction in its absolute emissions.
- All previous formulations used to be in terms of emission intensity, which is intensity per unit of GDP.
- However, the 1 billion tonne reduction promise is not unrelated to the emission intensity target.
- The emission intensity target is also about bending the emission trajectory.
- It seeks to ensure that while India's GDP as well as emissions would continue to grow, the rate of growth of emissions would be slower than that of GDP so that more GDP is created for the same amount of emission.
- The promise to reduce 1 billion tonnes of emission could, therefore, just be another way of reiterating the emission intensity target.