

Current Affairs MONTHLY



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By
CivilsTap Himachal



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GENERAL STUDIES 1.

GEOGRAPHY

MELOCANNA BACCIFERA

- *Melocanna baccifera*, a tropical bamboo species, has long intrigued researchers for its association with the occurrence of 'bamboo death,' 'rat floods' and famines in northeast India.

Finding

- Researchers detected a correlation between the sugar content in the fruit of *Melocanna baccifera* and the frenzied feeding and population boom in rats during 'Mautam', the cyclical, mass bamboo flowering that occurs once in 48 years.
- *Melocanna baccifera* is the largest fruit-producing bamboo and is native to the northeast India-Myanmar region.
- During its gregarious flowering, the bamboo produces large fruits which draw animal visitors/predators.
- Of these, black rats greatly relish the fleshy, berry-like fruit.
- During this period, they also multiply rapidly, a phenomenon dubbed as 'rat flood.'
- Once the fruits are gone, they start devouring standing crops, causing famines that have claimed thousands of human lives.

Melocanna baccifera

- It is one of two bamboo species belonging to the *Melocanna* genus.
- It is the largest fruit-producing bamboo.
- It grows up to 10–25 m tall.
- It is native to Bangladesh, Myanmar, India, and Thailand.
- It is an invasive species that can occupy large areas due to its long and vigorous rhizomes and, in flowering, for its fruits that are easy to germinate.
- One of the most useful bamboos within its native range, especially in Bangladesh, it provides edible shoots, medicine and culms that have a wide range of uses.
- The plant is also grown as an ornamental purposes.

Cultivation of Melocanna Baccifera:

- A plant of the moist tropics. It grows best in areas where the mean annual temperature falls within the range 20 – 33°C, though it can tolerate 15 – 38°C.
- It prefers a mean annual rainfall in the range 2,000 – 3,000mm, tolerating 600 – 4,400mm.
- Succeeds in moist soils, preferring a fertile medium to heavy soil.
- Bamboos in general are usually monocarpic, living for many years before flowering, then flowering and seeding profusely for a period of 1 – 3 years before usually dying.
- The plant flowers gregariously, with a flowering cycle of 30 – 45 years. In the season before flowering no new shoots are produced. Flowering may continue for about 10 years over a tract that is sometimes called a flowering wave.

Uses

- In its native area, especially in Bangladesh, *M. baccifera* is one of the most useful bamboos.
- Its culms are widely used in house building,
- To make woven wares (baskets, mats, handicrafts, wall plates, screens, hats) and domestic utensils,
- And are an important source of superior paperpulp.
- The young shoots are edible and during the rainy season constitute one of the important foods.

- The shoots are also sliced and dried in the sun for preservation.

Medicinal Uses

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

INDONESIA EARTHQUAKE

- The death toll from a 5.6-magnitude earthquake in Indonesia has risen to 162 with hundreds injured and over 13,000 displaced.

About the disaster

- The US Geological Survey said the magnitude 5.6 quake was centered in the Cianjur region in West Java province at a depth of 10 kilometres (6.2 miles).
- Indonesia's Meteorology, Climatology, and Geophysical Agency recorded at least 25 aftershocks.
- Several landslides were reported around Cianjur.
- Indonesia, the country of more than 270 million people is frequently struck by earthquakes, volcanic eruptions and tsunamis because of its location on the "Ring of Fire,"
- It also caused panic in the greater Jakarta area, where high-rises swayed and some were evacuated. Earthquakes occur frequently across the sprawling archipelago nation, but it is uncommon for them to be felt in Jakarta.

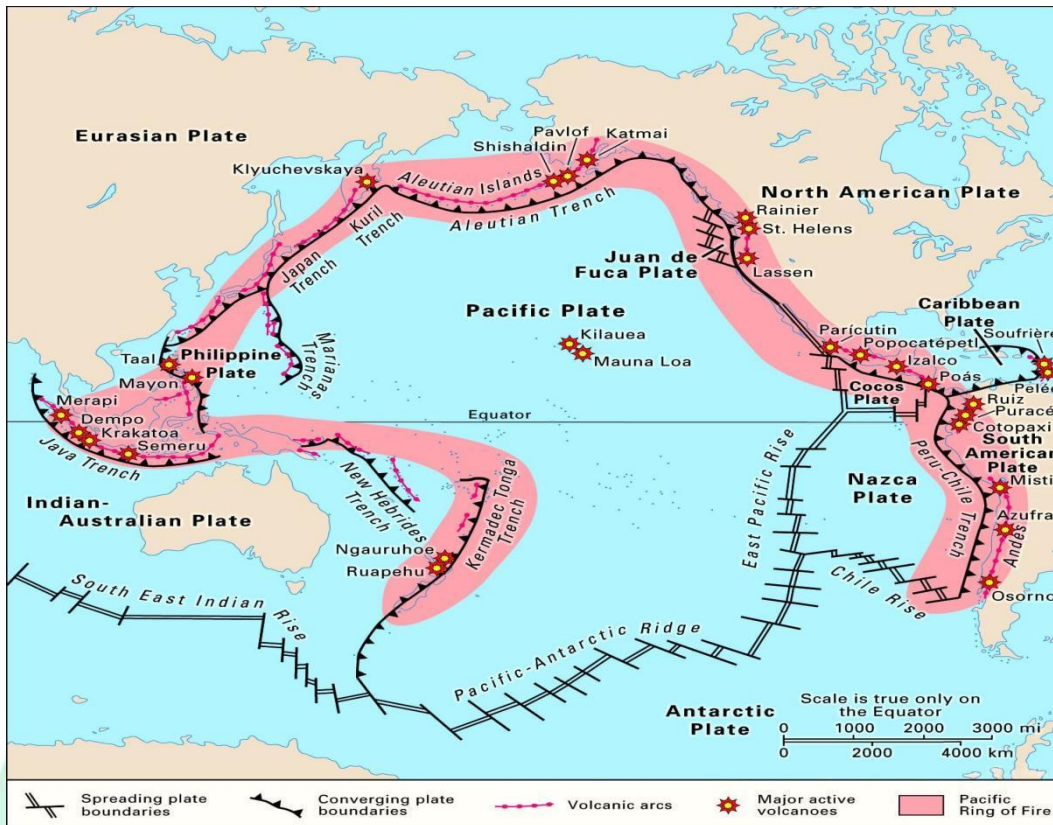
Pacific Ring of Fire

- The Ring of Fire, also referred to as the Circum-Pacific Belt/Zone, is a path along the Pacific Ocean characterized by active volcanoes and frequent earthquakes. Its length is approximately 40,000 kilometers. Circum-Pacific Zone
- Seventy-five percent of Earth's volcanoes—more than 450 volcanoes—are located along the Ring of Fire.
- Ninety percent of Earth's earthquakes occur along its path, including the planet's most violent and dramatic seismic events.

Location

- It traces boundaries between several tectonic plates—including the Pacific, Juan de Fuca, Cocos, Indian-Australian, Nazca, North American, and Philippine Plates.
- The chain runs up along the western coast of South and North America, crosses over the Aleutian Islands in Alaska, runs down the eastern coast of Asia past New Zealand and into the northern coast of Antarctica.

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The Ring of Fire is a direct result of plate tectonics:

- Along much of the Ring of Fire, plates overlap at convergent boundaries called subduction zones. That is, the plate that is underneath is pushed down, or subducted, by the plate above. As rock is subducted, it melts and becomes magma. The abundance of magma so near to Earth's surface gives rise to conditions ripe for volcanic activity.
- Transform boundary: The border between the Pacific and North American Plates is a transform boundary, where plates move sideways past one another and generates many earthquakes as tension in Earth's crust builds up and is released.
- Consumption of oceanic lithosphere at these convergent plate boundaries has formed oceanic trenches, volcanic arcs, back-arc basins, and volcanic belts.

KALI TIGER RESERVE

- Karnataka State Forest Department has written to the National Tiger Conservation Authority-Project Tiger Division (NTCA), under the Ministry of Environment Forest and Climate Change, to include Kali Tiger Reserve (KTR) in the Economic Evaluation of Tiger Reserves in India – Phase III, to be taken up in 2023.
- The Kali reserve represents great diversity in terms of tiger landscape, ecosystems and socio-economic conditions, and was therefore a fit case to be selected for the economic evaluation.

About the Kali Tiger Reserve

- Kali Tiger Reserve, earlier known as Dandeli-Anshi Tiger Reserve, is located in the central portion of the Uttara Kannada (North Canara) district of Karnataka state.
- It is sandwiched between Haliyal and Karwar forest divisions and covers parts of Haliyal, Karwar, and Joida taluks.
- The Tiger Reserve comprises two important protected areas of the region viz., Dandeli Wildlife Sanctuary (475.018 Km²) and Anshi National Park (339.866 Km²).
- These two protected areas are contiguous to each other and form a single tract of the protected area located in the biologically sensitive Western Ghats.
- These two protected areas were administratively unified under Dandeli-Anshi Tiger Reserve (DATR) in the year 2007.

- Forests of the Tiger Reserve are primarily moist deciduous and semi-evergreen, with excellent patches of evergreen forests in the westernmost parts as well as in deep valleys.
- Animals found in the Tiger Reserve include Tiger, Leopard, Elephant, Bison, Wild dog, Sambar, Spotted deer, Sloth bear, Wild boar, Hanuman langur, Bonnet macaque, varieties of reptiles and birds including all four species of hornbills as its residents., etc.
- Kali Tiger Reserve is home to rare black panthers.
- Kali Tiger Reserve was located in the biologically sensitive Western Ghats, which was an UNESCO World Heritage Site and a global biodiversity hotspot.
- Kali Tiger Reserve formed an important tiger corridor of Central Western Ghats connecting the tiger habitats in Karnataka, Goa, and southern Maharashtra.



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HISTORY

SARDAR PATEL

- Leaders across the political spectrum on Monday paid tributes to India's first Home minister Sardar Vallabhai Patel on his birth anniversary, calling him "a hero" whose "contributions shaped modern India".
- National Unity Day marks the birth anniversary of Sardar Vallabhbhai Patel on October 31.

Sardar Patel

- Sardar Vallabhbhai Patel was a prominent figure in the Indian Freedom Struggle, who later became India's first Deputy Prime Minister and first Home Minister.
- He is known for his contribution in integrating 565 princely states into a newly independent India.
- Sardar Patel who is popularly known as the Iron Man of India made many important contributions to Indian freedom struggle and modern India.
- In 1918, Vallabhbhai took the responsibility of leading the farmers of Gujarat. He started the Kheda satyagraha that demanded the suspension of the revenue collection from farmers as there was a drought.
- In 1920, the Congress started the non-cooperation struggle and Vallabhbhai gave up his practice. He setup the Gujarat Vidyapeeth where children could study instead of attending Government schools.
- In 1928 he successfully organized the landowners of Bardoli against British tax increases. It was after this that Vallabhbhai was given the title of Sardar (Leader).
- In 1931 he served as President of the Indian National Congress in its Karachi session which changed the nature of movement from a political struggle and added to it new socio-economic dimensions. As part of congress, he was part of the No changers faction and emphasised on the crucial role of constructive work in village regeneration and carrying the message of nationalism to the masses.
- Toured during the Kheda campaign (1918) which was a success, supported Gandhi in Non-cooperation Movement (1920), was arrested during the Dandi Salt March (1930).
- He was awarded the Bharat Ratna posthumously in 1991. His birth anniversary is observed as Rashtriya Ekta Diwas (National Unity Day) since 2014.

Headed following Committees of the Constituent Assembly:

- Advisory Committee on Fundamental Rights.
- Committee on Minorities and Tribal and Excluded Areas.
- Provincial Constitution

About Statue of Unity

- The Statue of Unity is a memorial to Sardar Vallabhai Patel. It was inaugurated on 31st October 2018 in commemoration to Sardar Patel on his 143rd birth anniversary.
- It is situated in the Kevadia town, Narmada district Gujarat. It has been built on the Sadhu Bet Island, on the Narmada River.
- It is the tallest statue in the world with a height of 182 mts.
- The Statue of Unity has been included in the 8 wonders of Shanghai Cooperation Organization (SCO).

A VISION FOR WOMEN'S EMPOWERMENT: THE STORY OF ELA BHATT'S SEWA

- SEWA, the Self Employed Women's Association set up by Ela Bhatt in 1972, has achieved something that no company, conglomerate, or perhaps even government has achieved in India — the creation of a truly effective employment support programme for women who are among the country's poorest and most marginalised.
- Over 50 years, SEWA has built more than four dozen institutions for the poor and by the poor, and to empower poor women workers — all founded on the principle that "the poor do not need charity, they need an enabling mechanism to strive and come out of the vicious circle of poverty and vulnerability".

About Ela Bhatt

- She was known as the “Gentle Revolutionary” who changed the lives of lakhs of women through her organisation, providing them with microloans for five decades.
- She founded the Self-Employed Women’s Association (SEWA) in 1972.
- She also headed the women’s wing of Majoor Mahajan Sangh-the Textile Labour Association founded by Anasuya Sarabhai and Mahatma Gandhi.
- She was the chairperson of the Sabarmati Ashram Memorial and Preservation Trust, also co-founded the Women’s World Banking, a global network of microfinance organisations, of which she was chairperson from 1984 to 1988.
- She was also nominated to Rajya Sabha, and was a member of the Planning Commission.
- She had also acted as an advisor to organisations like the World Bank.
- In 2007, she joined the Elders, a group of world leaders founded by Nelson Mandela to promote human rights and peace.
- She was a prodigious writer who penned in Anasuya, our Gujarati newsletter, a play on street vendors. One of her famous book was “We are Poor but We are Many”.
- She was a recipient of the Padma Bhushan, Ramon Magsaysay Award and Indira Gandhi International Prize for Peace among many other awards.

Self Employed Women’s Association

- SEWA was born out of the Textile Labour Association (TLA) — founded by Anasuya Sarabhai and Mahatma Gandhi in 1920 —
- But it could not register as a trade union until 1972 because its members did not have an “employer”, and were thus not seen as workers.
- In 1981, after the anti-reservation riots in which the Bhattas were targeted for supporting quotas for Dalits in medical education, the TLA broke up with SEWA. “
- At the time of the break from the TLA, SEWA had 4,900 members, a small cooperative bank, an office building, a rural centre, one vehicle, and a few typewriters.
- As early as in 1974, SEWA Bank was established to provide small loans to poor women — an initiative that was recognised by the International Labour Organisation as a microfinance movement.
- The Unorganised Workers Social Security Act (2008), the National Rural Livelihoods Mission (2011), and the Street Vendors Act (2014), are seen as successes of SEWA’s struggle. The PM Street Vendors Atmanirbhar Nidhi (PM-SVANidhi) scheme is seen as being inspired by SEWA’s microfinance model.
- With an annual membership fee of just Rs 10, SEWA allows anyone who is self-employed to become a member.
- Its network is spread across 18 Indian states, in other countries of South Asia, in South Africa, and Latin America.
- It simultaneously provided employment to women and promoted cooperative production, consumption and marketing of textiles which constituted the core of India’s industrialisation.

MAULANA ABUL KALAM AZAD

- Recently, the Prime Minister of India paid tributes to Maulana Azad on his birth anniversary.
- Maulana Azad was a Indian Scholar and Muslim Leader of Indian National Congress during Indian Independence Movement.
- Post Indian Independence, he became the First Minister of Education in Indian Government.
- He played an important role in Hindu-Muslim unity and never supported India’s partition.

Personal details

- Born: November 11, 1888; Place of Birth: Mecca, Saudi Arabia
- Political Ideology: Liberalism; right-winged; Egalitarian
- Publications: Ghubar-e-Khatir (1942-1946); India Wins Freedom (1978); weekly called “Al-Hilal” and “Al-Balagh”.

- On February 22, 1958 Maulana Abul Kalam Azad, one of the foremost leaders of the Indian freedom struggle passed away.
- For his invaluable contribution to the nation, Maulana Abul Kalam Azad was posthumously awarded India's highest civilian honour, the 'Bharat Ratna' in 1992.
- He was the founder of the Jamia Milia Islamia Institution in Delhi along with fellow khilafat leaders which has blossomed into a renowned University today.
- His birthday, November 11, is celebrated as National Education Day in India.

Contributions of Maulana Azad:

Before independence

- **Hindu-Muslim unity:** During his young age, he rose to prominence through his work as journalist, publishing works critical of British Raj and espousing causes of Indian nationalism. He worked for Hindu-Muslim unity through the Al-Hilal newspaper.
- **Khilafat movement:** Maulana Azad was a prominent Leader in Khilafat Movement in which he came in close contact with National Leaders such as Mahatma Gandhi, Vallabh Bhai Patel and Jawahar Lal Nehru.
- **Non-cooperation movement:** Maulana Was disheartened by the Rowlatt Act of 1919 and worked to organise the Non-Cooperation Movement and Protests in opposition of the Act. He Organised several agitations and worked in the able guidance of Gandhi Ji and his principles.
- **Dharasana Satyagraha:** He was one of main organisers of the Dharasana Satyagraha in 1931 and emerged as one of the most important national leaders of the time, prominently leading causes of Hindu-Muslim unity as well as espousing secularism and socialism.
- **Protest against Two Nation Theory:** Maulana criticised Jinnah over Two Nation Theory and believed that Hindu and Muslims can co-exist in Independent India.
- **Quit India Movement:** He played a significant role in the Quit India Movement by meeting a large number of People in rallies and led agitations and protests against Colonial Government. He served as the Congress president from 1940 to 1945, during which the Quit India movement was launched.
- **India's independence:** He negotiated with the British Cabinet mission for India's independence. Further, he was strictly against India's partition even after acceptance of partition by Gandhiji.

Post-Independence

- **Member of Constitution assembly:** He was a member of constituent assembly and helped in shaping the Constitution of India.
- **Education:** He was the first Union Minister of education. He played a pivotal role in foundation of IIT, UGC, AICTE, Sahitya Academy, Lalit Kala Academy, Sangeet Natak Academy and many other educational initiations in India.
- **Research:** He held portfolios of Natural resources and scientific research. He played a pivotal role in foundation of CSIR and scientific research laboratories in India.
- Maulana's contributions in Indian Independence are very significant and vital. He considered Gandhiji as his Ideal and worked on his principles and political lines. His contributions will be remembered and acknowledged by generations to come. For his service to the nation, he was posthumously awarded the country's highest civilian award, the Bharat Ratna.

UNVEILING OF A STATUE OF THE 16TH-CENTURY FOUNDER OF BENGALURU - NADAPRABHU KEMPEGOWDA

- It is the "first and tallest bronze statue of a founder of a city," as per 'World Book of Records'. The monument is named as the "Statue of Prosperity".
- It has been built to commemorate the contribution of Kempegowda, the founder of the city, towards the growth of Bengaluru.
- Renowned sculptor and Padma Bhushan awardee Ram Vanji Sutar has designed the statue.

Nadaprabhu Kempegowda

- Nadaprabhu Kempegowda is a 16th-century chieftain of the Vijayanagara empire.
- He belonged to the Vokkaliga community in south Karnataka.

Contributions

- He is credited as the founder of Bengaluru City.
- It is said that he conceived the idea of a new city while hunting with his minister and later marked its territory by erecting towers in four corners of the proposed city.
- He is also known to have developed around 1,000 lakes in the city to cater to drinking and agricultural needs.
- One of his social reforms was to prohibit the custom of amputating the last two fingers of the left hand of unmarried women during “Bandi Devaru”, an important custom of Morasu Vokkaligas.

ACHARYA KRIPALANI

- The Prime Minister has paid tributes to Acharya Kripalani on his Jayanti.
- Jivatram Bhagwandas Kripalani (1888 – 1982), popularly known as Acharya Kripalani, was an independence activist, Indian politician and an Educationist.

Educationist:

- Kripalani was also well-known for his work in the field of education. From 1912 to 1927, he taught at various places before becoming wholly involved in freedom movement.
- He earned the moniker ‘Acharya’ around 1922 when he was teaching at the Gujarat Vidyapith, founded by the Mahatma a couple of years before.

Independence Activist

- He was involved in the organization of Non-Cooperation Movement and the Civil Disobedience movements and Quit India Movement.
- He was the President of Indian National Congress (INC) at the time of independence.
- He served in the Interim government of India (1946–1947) and the Constituent Assembly of India.

Political Career: Post-independent India

- Post-independence, he left the Congress and became one of the founders of the Kisan Mazdoor Praja Party (KMPP). This party subsequently merged with the Socialist Party of India to form the Praja Socialist Party (PSP).
- He remained in opposition for the rest of his life and was elected to the Lok Sabha in 1952, 1957, 1963 and 1967 as a member of Praja Socialist Party.
- Kripalani moved the first-ever No confidence motion in Lok Sabha in 1963, immediately after the India-China War.
- He remained a critic of Nehru's policies and Indira Gandhi's authoritarian rule. He was arrested during Emergency.
- **An Environmentalist:** He, along with Vinoba Bhave, was involved in preservation and conservation activities throughout the 1970s.
- **Books:** My Times, his autobiography published posthumously in 2004 and Gandhi: His Life and Thought (1970).

BIRSA MUNDA

- On the occasion of the birth anniversary of tribal leader Birsa Munda, the Centre marked the second Janjatiya Gaurav Divas on November 15 to celebrate the contributions of tribal communities to Indian culture.
- President Droupadi Murmu, who was appointed India's first tribal woman president this year, visited Ulihatu village in the Khunti district of Jharkhand – the birthplace of ‘Bhagwan’ Birsa Munda – and paid floral tributes.
- The government has also paid tributes to other pre-independence era tribal leaders recently, with the statue of Alluri Sitharama Raju inaugurated by the Prime Minister this year and new ‘tribal museums’ announced.

Munda Tribe

- The Munda tribe inhabited the Chota Nagpur region of today's Jharkhand.
- This was done in part by allying with local zamindars, who helped force the tribals into bonded labour.
- A feudal zamindari system was introduced, destroying the tribal "Khuntkatti" agrarian and land ownership system that was more community-based.
- The Raj brought in outsiders — moneylenders and contractors, as well as feudal landlords — to aid them.
- With the impact of British rule and activities of Christian missionaries, many tribals became critical of the British and missionaries' presence.

Birsa Munda

- Birsa Munda was born in 1875, the British were attempting to establish control over and exploit forest lands, disrupting the tribal way of life.
- He belonged to the Munda tribe in the Chota Nagpur Plateau area. He converted to Christianity in order to join the German Mission school. However, he later decided to renounce Christianity and drop out of the School.
- **Birsait Faith:** He created a new religion called Birsait, which worshipped only one god. Given his growing influence in the tribal community, Birsait soon became the popular religion among the Mundas and Oraons. He was also given the nickname 'Dharti Abba' or Father of the Earth.
- **Influence on Birsa Munda:** During the 1880s, Birsa closely witnessed the Sardari Larai movement in the region, which demanded the restoration of tribal rights through non-violent methods like sending petitions to the Raj. However, the oppressive colonial regime paid no heed to these demands.

Munda Rebellion

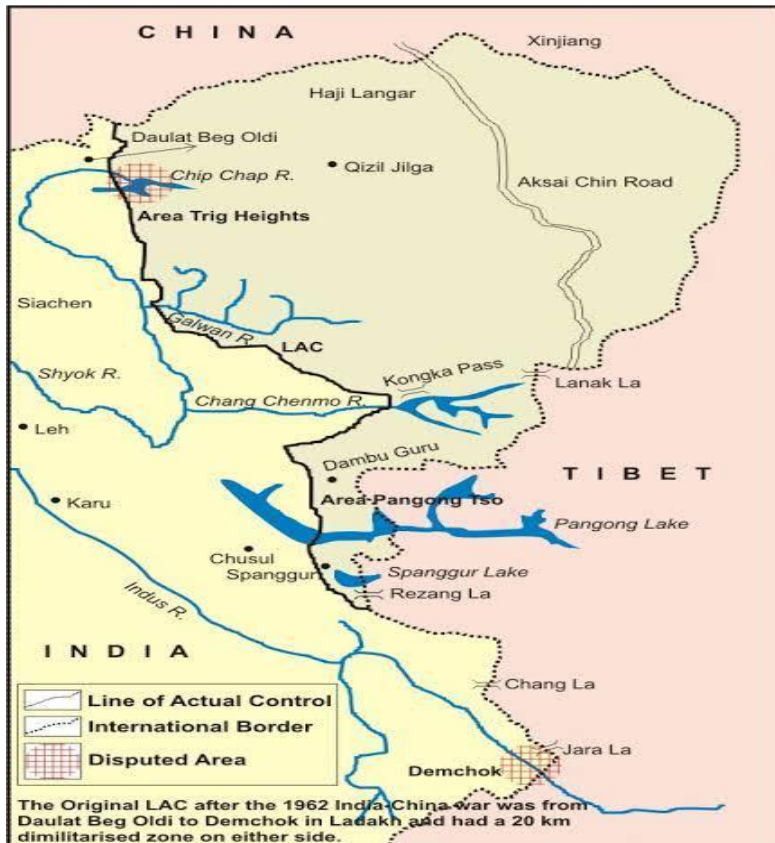
- It was led by Birsa Munda. It was a revolt against the colonial masters and exploitative dikus(outsiders) and was aimed at establishing Munda Raj or Munda rule in this region.
- The revolt later came to be known as The Ulgulan or "the Great Tumult".
- **Reason for Munda Revolt:** In 1874, the British replaced the Khuntkari system of Munda tribals with the zamindari system.
- The introduction of the zamindari system created the classes of zamindars (landlords) and ryots (tenants).
- It also intensified the forced labour (veth bigari) in the forested tribal areas and made tribals depend on money lenders for money.
- **Impact of the Munda Revolt:** The movement compelled the British to take cognisance of the plight and exploitation of tribals and bring in the Chhota Nagpur Tenancy Act of 1908 for their protection. This Act restricted the transfer of tribal land to non-tribals giving Adivasis a huge relief and became a landmark legislation for the protection of tribal rights.

BATTLE OF REZANG LA

- November 18, 2022, is the 60th anniversary of the Battle of Rezang La, one of the few bright spots in the War of 1962 with China. On that day, 13 Kumaon's C Company made their heroic last stand against the Chinese army in the high Himalayas of Ladakh, warding off a very significant threat and, in the process, writing a glorious chapter in India's military history.

About Rezang La:

- It is also called Rechin La.
- The brightest of the bright spots in the pervasive darkness of 1962 was the Battle of Rezang La in the high Himalayas in Ladakh.
- The place is a massive 16,000-foot-high feature in the narrow gap between the even higher mountains surrounding the strategic village of Chushul and the Spanggur Lake that stretches across both Indian and Chinese territories.
- Rezang La is, therefore, vital for the defence of the crucially important Chushul.
- Any invader reaching there would have had a free run to Leh.



About the war memorial:

- It is dedicated to those who laid down their lives in the Battle of Rezang La during the 1962 war.
- It will now include the names of Army personnel who lost their lives in the violent clash at Galwan last year.
- 18th November marks the 60th anniversary of the Battle of Rezang La in which Troops from the 13 Kumaon Regiment defeated several waves of the Chinese Army at a height of over 16,000 feet.

RANI LAKSHMIBAI

- The Prime Minister has remembered Rani Lakshmbai on her Jayanti.

About Rani Laxmibai

- Rani Laxmibai is known for her role in the First War of India's Independence in 1857.
- She was born in 1835.
- When growing up with Nana Sahib and Tatya Tope, she got training in martial arts, sword fighting and horse riding and became proficient in them. She was more independent than other girls of her age, due to her unconventional upbringing.
- She got married to the king of Jhansi. The couple adopted a son before the king's death which the British East India Company refused to accept as the legal heir and decided to annex Jhansi.
- In 1853, when the Maharaja of Jhansi died, the East India Company took advantage of the situation and applied the Doctrine of Lapse to annex Jhansi.
- Refusing to cede her territory, the queen decided to rule on behalf of the heir and later joined the uprising against the British in 1857.
- Cornered by the British, she escaped from Jhansi fort. She was wounded in combat near Gwalior's Phool Bagh where she later died.
- Sir Hugh Rose, who was commanding the British army, is known to have described her as "personable, clever and one of the most dangerous Indian leaders".
- When the Indian National Army started its first female unit (in 1943), it was named after the valiant queen of Jhansi.

Doctrine of Lapse

- It was an annexation policy followed widely by Lord Dalhousie when he was India's Governor-General from 1848 to 1856.
- According to this, any princely state that was under the direct or indirect control of the East India Company where the ruler did not have a legal male heir would be annexed by the company.
- Thus, any adopted son of the Indian ruler would not be proclaimed as heir to the kingdom.
- By applying the doctrine of lapse, Dalhousie annexed the States of:
 - Satara (1848 A.D.),
 - Jaitpur, and Sambalpur (1849 A.D.),
 - Baghat (1850 A.D.),
 - Udaipur (1852 A.D.),
 - Jhansi (1853 A.D.), and
 - Nagpur (1854 A.D.)

GURU TEGH BAHADUR JI

- November 24 is commemorated as the Shaheedi Divas of Guru Tegh Bahadur, the ninth guru of the Sikhs, who stood up against forcible conversions by the Mughals, and was executed on the orders of Aurangzeb in 1675.

About Guru Tegh Bahadur

- Tegh Bahadur was born in Amritsar on April 21, 1621 to Mata Nanki and Guru Hargobind, the sixth Sikh guru, who raised an army against the Mughals and introduced the concept of warrior saints.
- As a boy, Tegh Bahadur was called Tyag Mal because of his ascetic nature.
- He spent his early childhood in Amritsar under the tutelage of Bhai Gurdas, who taught him Gurmukhi, Hindi, Sanskrit, and Indian religious philosophy, while Baba Budha trained him in swordsmanship, archery, and horse-riding.
- He was only 13 when he distinguished himself in a battle against a Mughal chieftain.
- His bravery and swordsmanship in the battle earned him the name of Tegh Bahadur.
- He was married to Mata Gujri at Kartarpur in 1632, and subsequently left for Bakala near Amritsar.
- After Guru Ram Das, the fourth Sikh guru, the guruship became hereditary.
- Aurangzeb was the ruling Mughal emperor at the time Guru Tegh Bahadur's guruship.
- His sermons, delivered in a mix of Sadukhri and Braj languages.
- While the guru was on the way back from Dhaka, Raja Ram Singh sought his help to broker a truce with the Ahom king.
- Gurdwara Dhubri Sahib on the banks of the Brahmaputra commemorates this peace accord.
- The guru was also honoured at Guwahati's Kamakhya temple.

Guru's martyrdom

- Back in Anandpur Sahib, the Guru was approached by Kirpa Das, a Kashmiri Brahmin who sought his protection with a group from the Valley.
- He told Guru Tegh Bahadur that local chieftains had told him to convert or face retribution.
- The guru assured Das and his group of his protection and told them to tell the Mughals that they should first try to convert the guru.
- He was tortured to death and beheaded at Chandni Chowk along with his three companions, Bhai Mati Das, who was torn asunder, Bhai Sati Das, who was burnt to death, and Bhai Dyala ji, who was put in boiling water.
- Till the very end they were asked to change their minds, but they remained resolute.
- Gurdwara Sis Ganj was built on the site on which they were executed in 1783.

TIPU SULTAN

- The birth anniversary of Tipu Sultan was observed recently, bringing his contested legacy to the forefront of political discourse once again.

About Tipu Sultan

- He was a ruler of the Kingdom of Mysore and the eldest son of Sultan Hyder Ali of Mysore.
- In the wider national narrative, Tipu has so far been seen as a man of imagination and courage, a brilliant military strategist who, in a short reign of 17 years, mounted the most serious challenge the Company faced in India.

Contribution of Tipu Sultan

- Tipu Sultan is the fearless 'Tiger of Mysore', a powerful bulwark against colonialism, and a great son of Karnataka.
- Tipu was the son of Haider Ali, a soldier who climbed the ranks in the army of the Wodeyar king of Mysore, and ultimately took power in 1761.
- Haider died while the 2nd Anglo-Mysore War (1780-84) was on and Tipu succeeded him in 1782.
- In the wider national narrative, Tipu has been seen as a man of imagination and a brilliant military strategist.
- In his short reign of 17 years, he mounted the most serious challenge the EIC faced in India.
- He was killed defending his capital Srirangapatnam in the Fourth Anglo-Mysore War.
- He made regular endowments during this period to many Hindu temples, including the famed Ranganathaswami Temple at Srirangapatna.
- Many sources mention the appointment of Hindu officers in Tipu's administration] and his land grants and endowments to Hindu temples, which are cited as evidence for his religious tolerance.
- Among the punishments Tipu applied to rebels or conspirators were forced conversion and the transfer of people from their home territories to Mysore.

Reforms by Tipu Sultan

- Tipu reorganised his army along European lines, using new technology, including what is considered the first war rocket.
- He devised a land revenue system based on detailed surveys and classification, in which the tax was imposed directly on the peasant.
- He collected this tax through salaried agents in cash, widening the state's resource base.
- He modernised agriculture, gave tax breaks for developing wasteland, built irrigation infrastructure and repaired old dams, and promoted agricultural manufacturing and sericulture.
- He built a navy to support trade, and commissioned a state commercial corporation to set up factories.
- As Mysore traded in sandalwood, silk, spices, rice and sulphur, some 30 trading outposts were established across Tipu's dominions and overseas.

Question: Discuss the reforms and contributions of Tipu Sultan to modernise his kingdom?

BUDDHIST NYINGMA SECT

- In a significant development in the Tibetan Buddhist circles, the Nyingma sect has identified a boy from Spiti in Himachal Pradesh as the reincarnation of the late Taklung Setrunga Rinpoche, a scholar known for his knowledge of Tibetan Tantric school.

The Nyingma Sect

- The Nyingma sect is the oldest of all Buddhist sects, and Taklung Setrunga Rinpoche was a profound scholar renowned for his expertise in Tibetan Tantric school.
- It is founded on the first lineages and translations of Buddhist scriptures from Sanskrit into Tibetan in the eighth century, during the reign of King Trisong Detsen (r. 710–755).
- Nyingma traditional histories consider their teachings to trace back to the first Buddha Samantabhadra (Güntu Sangpo) and Indian mahasiddhas such as Garab Dorjé, Śrī Siṃha and Jñānasūtra.

- Traditional sources trace the origin of the Nyingma order in Tibet to figures associated with the initial introduction of Buddhism in the 8th century, such as Padmasambhava, Yeshe Tsogyal, Vimalamitra, Vairotsana, Buddhaguhya and Shantaraksita.
- The Rinpoche used to live in the Takthok monastery of Ladakh, one of the oldest monasteries related to the Nyingma sect.
- The followers of the sect are spread across Tibet, Bhutan, Ladakh, Sikkim and other Himalayan Buddhist pockets.
- The Rinpoche was widely consulted by the followers of the faith.
- The “reincarnation” of a prominent Rinpoche is important in the contest for supremacy over Buddhist affairs.
- The veteran monks of various schools of Tibetan Buddhism, including the Dalai Lama, spread in many of the ancient monasteries in the Himalayas command a wide following across the Buddhist community in Tibet, India and other parts of the world.

Some Unique Aspects Nyingmapa Tradition:

- The practice of Dzogchen (Great Perfection). It the highest perfection in deity visualization.
- It seeks to directly examine the fundamental mind without the aid of Visualization like statue and Thangka.
- The tradition of Terma. Padmasambhava has hidden lots of scriptures in a different location for the future master to find and preach.

Teachings of the Nyingma Sect:

- Its teachings are mainly based on those of Padmasambhava, called Guru Rinpoche and Shantarakshita who were brought to Tibet through the rule of the Emperor Trisong Detsen from 742 to 797 CE.
- Buddhist teachings are classified into nine yanas with ‘Dzogchen’ being most important.
- Dzogchen (Great Perfection) philosophy revolves around pure awareness which can be achieved through meditation.
- This Vajrayana tradition involves use of ritual, symbols and tantric practices to achieve nirvana.
- Therefore, Nyingma stresses on teachings attributed to Padmasambhava, the Dzogchen doctrines as well as Tantric practices.
- The Nyingma School is also associated with Termas (hidden treasures).

Question: Highlight the important features of the Nyingma Sect.

CULTURE OF INDIA

NATIONAL TRIBAL DANCE FESTIVAL

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

National Tribal Dance Festival

- National Tribal Dance Festival is one of Chhattisgarh's grand festivals which celebrates diverse tribal communities and their culture not just in India but from across the globe.
- It is organised under the Tourism and Culture Department of Chhattisgarh.
- This festival aims to unite the tribal communities and provides an opportunity to educate about their rich culture for all.
- The first National Tribal Dance Festival was organised in 2019 and second in 2021.
- Men and women perform some dances exclusively, while in some performances men and women dance together.
- In the National Tribal Dance Festival, tribal dance groups from all states and union territories of India will be taking part.
- The highlights of the National Tribal Dance Festival will be the other countries including Mongolia, Togo, Russia, Indonesia, Maldives, and Mozambique participating in the event.
- About 1500 tribal artists will take part in the event of which 1400 will be from India and 100 will be from other countries.
- The festival will have several competitions in two categories and prizes worth ₹20 lakh will be given to the winners.
- The award includes cash prizes of ₹5 lakh, ₹3 lakh, and ₹2 lakh to the first, second, and third winners respectively.

BALI YATRA

- During the G20 Summit, Prime Minister mentioned Baliyatra, literally 'voyage to Bali', on the banks of the Mahanadi in Cuttack, which celebrates the ancient trade relations between India and Indonesia.
- This year's Baliyatra, which concluded on Thursday, also found a place in the Guinness World Records for achieving an impressive feat of origami, the creation of beautiful paper sculptures.

Historical significance

- Baliyatra, literally 'voyage to Bali', is one of the country's largest open-air fairs, which is organised every year to commemorate the 2,000-year-old maritime and cultural links between ancient Kalinga (today's Odisha) and Bali and other South and Southeast Asian regions like Java, Sumatra, Borneo, Burma (Myanmar) and Ceylon (Sri Lanka).
- The origins of the festival, which begins on Kartik Purnima (full moon night in the month of Kartik) can be traced back more than 1,000 years.
- The Bay of Bengal region had several ports, and sadhavas (traders) traditionally began their voyage across the sea on this auspicious day, when the winds were favourable for the boats, known as boita, to sail.
- According to historians, popular items of trade between Kalinga and Southeast Asia included pepper, cinnamon, cardamom, silk, camphor, gold, and jewellery.
- Even today, thousands of people across Odisha sail decorative miniature boats made of banana stems, paper, or thermocol to celebrate boita bandana, or the worshipping of the boats.
- Bali formed a part of the four islands that were collectively called the Suvarnadvipa, today known as Indonesia as their major trade hub along with other islands in the region.
- The Kalingas constructed large boats called the 'Boitas' and with the help of these, they traded with the Indonesian islands.

- These ships had copper hulls and could carry up to seven hundred men and animals aboard. Interestingly, the Bay of Bengal was once known as the Kalinga Sea as it was thronged by these ships.
- The dominance of the Kalingas over the sea routes can be understood from the fact that Kalidasa in his Raghuvamsa referred to the King of Kalinga as 'The Lord of the Sea'.

NICOBARI HODI CRAFT

- The Geographical Indications Registry at Guindy, Chennai, has received an application from the Tribal Development Council, Andaman & Nicobar Islands, seeking the Geographical Indication (GI) tag for the Nicobari hodi craft. This is the first application from the Union Territory seeking a tag for one of its products.

About Hodi Craft

- The hodi is the Nicobari tribe's traditional craft.
- It is an outrigger canoe, very commonly operated in the Nicobar group of islands.
- The technical skills for building a hodi are based on indigenous knowledge inherited by the Nicobarese from their forefathers.
- The hodi is built using either locally available trees or from nearby islands.
- Its design varies slightly from island to island.
- The tuhet, a group of families under a headman, consider the hodi an asset. Hodi races are held between islands and villages.

1,000th GI application in Chennai office

- The Geographical Indications Registry, established in Chennai in September 2003, has received over 1,000 applications.
- An application seeking GI tag for the Banaras' thandai (a beverage made with milk, dry fruits and spices) was the 1,000th application, which was filed two weeks ago.

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GENERAL STUDIES 2.

POLITY

BASIC STRUCTURE DOCTRINE

- The Supreme Court has agreed to examine a PIL challenging changes made to the right to freedom of speech and expression by the first amendment to the Constitution in 1951, with the petitioner contending that the amendment damages the basic structure doctrine.
- The plea urged the court to declare Section 3 (1)(a) and 3 (2) of the First Amendment “beyond the amending power of Parliament” and void since the “same damage the basic or essential features of the Constitution and destroy its basic structure”.

About

- Section 3(1) of the 1951 Amending Act substituted original Clause (2) of Article 19 – dealing with reasonable restrictions on the freedom of speech and expression guaranteed under Article 19(1)(a) – with a new Clause (2), which contained “two objectionable insertions” allowing restrictions also “in the interest of public order” and “in relation to incitement to an offence”. The new Clause (2) also omitted the expression “tends to overthrow the State” as appearing in the original Clause (2).
- The petition contended that these two insertions protect Sections 124A (sedition), 153A (promoting enmity between different groups on grounds of religion, race, place of birth, residence, language, etc, by words, either spoken or written, or by signs or by visible representations or otherwise and doing acts prejudicial to maintenance of harmony, 295A (deliberate and malicious acts, intended to outrage religious feelings of any class by insulting its religion or religious beliefs) and 505 (statements conducing to public mischief) of the Indian Penal Code “from the vice of unconstitutionality”.
- The two questionable expressions inserted unduly abridge the fundamental right under Article 19 (1)(a),” .
- This undue abridgement “does not advance or sub serve any constitutional objectives” but “damages, inter alia democracy and republicanism and supremacy of the Constitution.
- The amendment also neglects national security by dropping the expression ‘tends to overthrow the State’,
- The plea urged the court to declare Section 3 (1)(a) and 3 (2) of the First Amendment “beyond the amending power of Parliament” and void since the “same damage the basic or essential features of the Constitution and destroy its basic structure”.

First Amendment

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

THE SUPREME COURT (SC) BANS ON THE TWO-FINGER TEST

- The Supreme Court on Monday declared that any person conducting the invasive ‘two-finger’ or ‘three-finger’ vaginal test on rape or sexual assault survivors will be found guilty of misconduct.
- A 2013 SC order had noted in a similar tone.
- Evidence of a victim’s sexual history is not material to case.

About the verdict

- The sole reason behind using the “regressive” test on traumatised sexual assault survivors is to see whether the woman or girl was “habituated” to sexual intercourse.
- Such a “concern” was irrelevant to fact whether she was raped or not.
- The faulty logic behind the test was that “a woman cannot be believed when she said she was raped merely for the reason that she was sexually active.
- “This so-called test has no scientific basis and neither proves nor disproves allegations of rape.
- It instead re-victimises and re-traumatises women who may have been sexually assaulted, and is an affront to their dignity.
- The court pointed out the 2013 amendment of Section 53A in the Indian Evidence Act. “...the evidence of a victim’s character or her previous sexual experience with any person shall not be relevant to the issue of consent or the quality of consent in the prosecution of sexual offences.
- The practice questions a woman’s character and is ‘patriarchal’ and ‘sexist’.
- It violates the right of rape survivors to privacy, physical and mental integrity and dignity.
- Thus, this test, even if the report is affirmative, cannot ipso facto, be given rise to presumption of consent.
- This came on the heels of the December 2012 Nirbhaya gangrape case, after which the Union health ministry updated the proforma for medical examination of rape victims to remove the two-finger test.
- A rape test kit, detailing tools required to collect evidence of sexual assault according to WHO guidelines, was prepared but failed to make any impact. In the absence of these kits, the two-finger test continued as is.
- The latest order creates the connection which was missing till now. Now medical text books will have to keep pace with legal changes and that will benefit young doctors and society at large.

Indian Evidence Act

- Originally passed in India by the Imperial Legislative Council in 1872, during the British Raj.
- When India gained independence on 15 August 1947, the Act continued to be in force throughout the Republic of India.
- It contains a set of rules and allied issues governing admissibility of evidence in the Indian courts of law.

This Act is divided into three parts:

- Part 1 deals with relevancy of the facts
- Part 2 deals with facts which need not be proved, oral evidence, documentary evidence.
- Part 3 deals with burden of proof, estoppel, witnesses and their examination
- Under Section 155(4) of the Indian Evidence Act, a rape survivor’s past sexual history used to be acceptable. The rape accused could state that the rape survivor was of immoral character and claim that she consented to the sexual acts.
- This section was removed in 2003 after recommendations in the Law Commission of India’s 172nd report.
- In 2013, the JS Verma Committee, created after the Nirbhaya gangrape case 2012, suggested that a past relationship between the accused and the victim should be inapt while deciding whether the victim consented.

THE AMENDMENTS TO THE IT RULES, 2021

- The Ministry of Electronics and IT (MeitY) has notified amendments to the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 (IT Rules, 2021).

What are the IT Rules, 2021?

- World over, governments are grappling with the issue of regulating social media intermediaries (SMIs).
- Given the multitudinous nature of the problem — the centrality of SMIs in shaping public discourse,
- The impact of their governance on the right to freedom of speech and expression.
- The magnitude of information they host and the constant technological innovations that impact their governance.
- It is important for governments to update their regulatory framework to face emergent challenges.

- In a bid to keep up with these issues, India in 2021, replaced its decade old regulations on SMIs with the IT Rules, 2021 that were primarily aimed at placing obligations on SMIs to ensure an open, safe and trusted internet.

Need to amend the IT Rules, 2021

- As per the press note accompanying the draft amendments in June 2022, the stated objectives of the amendments were three-fold.
- First, there was a need to ensure that the interests and constitutional rights of netizens are not being contravened by big tech platforms,
- Second, to strengthen the grievance redressal framework in the Rules.
- Third, that compliance with these should not impact early stage Indian start-ups.
- This translated into a set of proposed amendments that can be broadly classified into two categories.
- The first category involved placing additional obligations on the SMIs to ensure better protection of user interests while the second category involved the institution of an appellate mechanism for grievance redressal.

Additional obligations placed on the SMIs

- To ensure that its users are in compliance with the relevant rules of the platform.
- The “rules and regulations, privacy policy and user agreement” are available in all languages listed in the eighth schedule of the Constitution.
- To “make reasonable” efforts to prevent prohibited content being hosted on its platform and to police and moderate content.
- To “respect all the rights accorded to the citizens under the Constitution, including in the articles 14, 19 and 21”.
- To remove information or a communication link in relation to the six prohibited categories of content as and when a complaint arises within 72 hours to contain the spread of the content.
- To “take all reasonable measures to ensure accessibility of its services to users along with reasonable expectation of due diligence, privacy and transparency” and to strengthen inclusion in the SMI ecosystem such as allowing for participation by persons with disabilities and diverse linguistic backgrounds.

Concerns

- SMIs are unclear of the extent of measures they are now expected to undertake and users are apprehensive that the increased power of the SMIs would allow them to trample on freedom of speech and expression.
- The wide interpretation to which this obligation is open to by different courts, could translate to disparate duties on the SMIs. Frequent alterations to design and practices of the platform, that may result from a case-to-case based application of this obligation, could result in heavy compliance costs for them.
- First, as evidenced by the transparency reports of SMIs, such as Facebook and Twitter, there is no common understanding of what is meant by resolution of the complaint.
- For example, Facebook records only mention the number of reports where “appropriate tools” have been provided. These “appropriate tools” could just mean the automated replies pointing out the tools available on the platform that have been sent to the complainants.
- Twitter records outline the number of URLs against which action has been taken after the receipt of a complaint.
- The number of user complaints continue to be quite low when compared to the content against which the platform acts proactively or is obligated to remove due to governmental or court orders.
- This may be because users are either not aware of this facility or find it futile to approach the platform for complaint resolutions or in case where action has been taken, there is no way to assess whether the complainant has been satisfied with the resolution of the complaint.
- Moreover, the extant framework does not provide for any recourse if the complainant is dissatisfied with the grievance officer’s order.

- Possibly, the only course available to the complainant is to challenge the order under the writ jurisdiction of the High Courts or Supreme Court. This is not efficacious given that it can be a resource and time intensive process.
- Prior to the IT Rules, 2021, platforms followed their own mechanisms and timelines for resolving user complaints.

Grievance Appellate Committees (GAC)

- The IT Rules uniformed this by mandating that all social media platforms should have a grievance officer who would acknowledge the receipt of a complaint within 24 hours and dispose it within 15 days.
- The committee is styled as a three-member council out of which one member will be a government officer (holding the post ex officio) while the other two members will be independent representatives.
- Users can file a complaint against the order of the grievance officer within 30 days.
- Importantly, the GAC is required to adopt an online dispute resolution mechanism which will make it more accessible to the users.
- Interestingly, it is unclear whether the user have to approach the grievance appellate committee before approaching the court as the institution of the GAC would not bar the user from approaching the court directly against the order of the grievance officer.
- While this makes the in-house grievance redressal more accountable and appellate mechanism more accessible to users, appointments being made by the central government could lead to apprehensions of bias in content moderation.
- Further, the IT Rules, 2021 do not provide any explicit power to the GAC to enforce its orders.
- Lastly, if users can approach both the courts and the GAC parallelly, it could lead to conflicting decisions often undermining the impartiality and merit of one institution or the other.

EWS QUOTA

- A five-judge constitution bench of the Supreme Court, by a 3-2 majority, upheld the validity of 103rd Constitutional Amendment Act, 2019 and held that the 10% EWS quota to “poorest of poor” among forward castes did not pose any danger to the Basic Structure of the Constitution.

Background

- Reservation for Economically Weaker Sections (EWS) of the society was granted based on the recommendations of a commission headed by Major General (retd) S R Sinho.
- The Commission was constituted by the then Union government in 2005, and submitted its report in 2010.
- To implement this, a Cabinet Note was prepared by the Ministry of Social Justice and Empowerment in 2019.
- Based on this, the Cabinet, in 2019, decided to amend the Constitution (103rd Amendment) to provide reservation to EWS.

About EWS Reservations

- The 103rd Constitutional Amendment Act, 2019 added Clause (6) to Article 15 of the Constitution to give the government the authority to make special provisions for the EWS among citizens who are not already eligible for reservation.
- The Act allows up to 10 per cent reservation in public and private educational institutions, whether aided or unaided, with the exception of minority-run institutions.
- The Act also added **Clause (6) to Article 16** of the Constitution to make employment reservations easier.
- **Article 16** of the Indian Constitution guarantees equal opportunity to all citizens in matters related to employment in the public sector.
- It was enacted to promote the welfare of the poor not covered by the 50% reservation policy for Scheduled Castes (SCs), Scheduled Tribes (STs) and Other Backward Classes (OBCs).
- The Act states unequivocally that the EWS reservation will be added to the existing reservation.

Eligibility Criteria

- Candidate's annual family income must be less than Rs. 8 lakhs per annum,

- Their family must not own more than 5 acres of agriculture land,
- The residential flat area should be below 1000 sq. ft.,
- The residential plot's area should be below 100 square yards if in a notified municipality sector,
- The residential plot's area should be below 200 square yards if in a non-notified municipality sector.

Court Judgement

- By a majority of 3:2, a five-judge Bench of the Supreme Court has upheld the validity of the 103rd Constitution Amendment, which came into effect in January 2019.
- The amendment was challenged, and the challenge was referred to a five-judge Constitution Bench in August 2020.
- The challenge was based on the argument that the 103rd amendment violated the “basic structure” of the Constitution.
- The Supreme Court had introduced the doctrine of basic structure in the landmark Kesavananda Bharati case, by which it ruled that certain aspects of the Constitution were inviolable, and could not be changed.
- The primary argument in this case was that the special protections guaranteed to socially disadvantaged groups is part of the basic structure.
- The petitioners argued that the 103rd Amendment departs from this by promising special protections on the sole basis of economic status.

Significance of the judgement

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

Concerns

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

Current issues in Reservation

- **Indira Sawhney judgment in 1992:** SC upheld the principle that the combined reservation beneficiaries should not exceed 50% of India’s population. However, with EWS reservation of 10%, the total reservation in India’s population amounts to almost 60%.

- **Rohini Commission report:** Asymmetrical distribution of reservation – 97% of central OBC quota benefits go to just under 25% of its castes. As many as 983 OBC communities — 37% of the total — have zero representation in both central government jobs and admissions to central universities.
- **Data Deficiency:** There is hardly any legible data on the socio-economic conditions of varied social groups at State & local level. Also, we do not know what liberalisation has done to castes which remained tied to more traditional sources of income.
- **The creamy layer threshold:** SC admits plea challenging Rs 8 lakh EWS annual income criteria is the same as that for the creamy layer of Other Backward Classes quota and is unfair.
- Lack of merit-based recognition
- Both sides agreed on the state's power to make special provisions for implementing reservation in private unaided institutions, including professional colleges.
- The Amendment cannot be said to violate Basic Structure by permitting the state to make special provisions in relation to admission to private unaided institutions.

22ND LAW COMMISSION

- The Centre has constituted the Law Commission of India with Justice (retd) Rituraj Awasthi, former Chief Justice of Karnataka High Court, at its head.

About Law Commission of India

- It is a non-statutory body. The government of India constitutes it, from time to time.
- The commission is established for a fixed tenure. It works as an advisory body to the Ministry of Law and Justice.

Functions

- It identifies obsolete laws. The laws which are no longer relevant, not in harmony with the existing climate and laws which require change.
- It suggests suitable measures for quick redressal of citizens' grievances in the field of law.
- It enables poors, to take benefit out of the legal process.
- Likewise, it examines the laws for promoting gender equality.
- The recommendations of the commission are not binding on the government. They are recommendations only. The government or concerned department may accept or reject these recommendations.

Establishment of Law Commission

- The first Law Commission was established during the British Raj era in 1834. It was established by the Charter Act of 1833 and was chaired by Lord Macaulay.
- In 1955, the first Law Commission of independent India was established for a three-year term. Since then, twenty-one more Commissions have been established.
- In 2015, The 21st Law Commission of India was established. Its tenure was up to 31st August 2018. In 2020, the Union Cabinet approved the creation of the 22nd Law Commission.

JHARKHAND WANTS NEW QUOTA BILL PLACED IN NINTH SCHEDULE

- The Jharkhand Assembly on Friday (November 11) cleared two Bills, one increasing reservation in vacant government posts and services in the state to 77 per cent, and the second to use land records with 1932 as the cut-off year to determine domicile status the definition of 'local residents'.

What is the Ninth Schedule?

- The Ninth Schedule contains a list of central and state laws which cannot be challenged in courts.
- Currently, 284 such laws are shielded from judicial review. Most of the laws protected under the Schedule concern agriculture/land issues.
- The Schedule became a part of the Constitution in 1951, when the document was amended for the first time.

- It was created by the new Article 31B, which along with 31A was brought in by the government to protect laws related to agrarian reform and for abolishing the Zamindari system.
- While A. 31A extends protection to 'classes' of laws, A. 31B shields specific laws or enactments.
- **Article 31B reads:** "Without prejudice to the generality of the provisions contained in article 31A, none of the Acts and Regulations specified in the Ninth Schedule nor any of the provisions thereof shall be deemed to be void, or ever to have become void, on the ground that such Act, Regulation or provision is inconsistent with, or takes away or abridges any of the rights conferred by, any provisions of this Part, and notwithstanding any judgment, decree or order of any court or Tribunal to the contrary, each of the said Acts and Regulations shall, subject to the power of any competent Legislature to repeal or amend it, continue in force."
- **The First Amendment** added 13 laws to the Schedule. Subsequent amendments in 1955, 1964, 1971, 1974, 1975, 1976, 1984, 1990, 1994, and 1999 have taken the number of protected laws to 284.

Kesavananda Bharati case and Basic structure

- The court clarified that the laws cannot escape the "basic structure" test if inserted into the Ninth Schedule after 1973, as it was in 1973 that the basic structure test was evolved in the Kesavananda Bharati case as the ultimate test to examine the constitutional validity of laws.

Indra Sawhney case:

- In the Indra Sawhney vs Union of India, popularly known as the Mandal Commission case, the Supreme Court ordered that total reservation should not exceed 50 percent.
- Critics believe that the 50 percent ceiling is a constitutional requirement without which the structure of equality of opportunity would collapse.
- Supreme Court's recent judgment regarding flexibility on the 50% cap on the reservation:
- The bill was cleared in the backdrop of a Supreme Court Constitution Bench's majority ruling in the Economically Weaker Section (EWS) case that the 50% cap on the reservation was not sacrosanct.

Outcome of this judgment:

- This ruling of SC has paved the way to give new life to the argument of several other States fighting to increase reservations for Socially and Economically Backward Classes (SEBC) beyond the 50% mark.
- Now, after the Jharkhand Assembly's move and the EWS judgment on this aspect, other States like Madhya Pradesh, Chhattisgarh and Karnataka are likely to get a fresh impetus to argue for extending reservations for Backward Classes beyond the 50% limit.

Ninth schedule and provision of 103rd CAA 2019:

- Before the EWS judgment once again affirming that the Indra Sawhney decision does not specifically bar a breach of the 50% limit, State governments considered that the only way to raise reservations was through a Constitutional amendment that included their legislations in the Ninth Schedule.

Jharkhand Reservation of Vacancies in Posts and Services (Amendment) Bill, 2022

- The Jharkhand Assembly passed a Bill to raise the total reservation for Scheduled Castes (SC), Scheduled Tribes (ST) and Other Backward Classes (OBC) in State government posts to up to 77%.

Amending Ninth schedule:

- In the Bill passed by the Jharkhand Assembly, the recommendation is to amend the Ninth Schedule of the Constitution accordingly.
- The 77 percent reservation breaches the 50 percent ceiling set by the Supreme Court in the landmark 1992 Indra Sawhney v Union of India verdict.
- However, placing legislation in the Ninth Schedule shields it from judicial scrutiny.

About breach of 50% ceiling:

- Without directly referring to the Indra Sawhney judgment of 1993, the Bill passed in Jharkhand Assembly noted that the 50% ceiling set out in the judgment never explicitly prohibited the breaching of the limit.

Are laws in the Ninth Schedule completely exempt from judicial scrutiny?

- While the Ninth Schedule provides the law with a “safe harbour” from judicial review, the protection is not blanket.
- When the Tamil Nadu law was challenged in 2007 (*I R Coelho v State of Tamil Nadu*), the Supreme Court ruled in a unanimous nine-judge verdict that while laws placed under Ninth Schedule cannot be challenged on the grounds of violation of fundamental rights, they can be challenged on the ground of violating the basic structure of the Constitution.
- The court clarified that the laws cannot escape the “basic structure” test if inserted into the Ninth Schedule after 1973, as it was in 1973 that the basic structure test was evolved in the *Kesavananda Bharati* case as the ultimate test to examine the constitutional validity of laws.
- The *IR Coelho* verdict said, “A law that abrogates or abridges rights guaranteed by Part III of the Constitution may violate the basic structure doctrine or it may not. If former is the consequence of law, whether by amendment of any Article of Part III or by an insertion in the Ninth Schedule, such law will have to be invalidated in exercise of judicial review power of the Court.”

SUPREME COURT ON RELIGIOUS CONVERSION

- While hearing a PIL on religious conversion, the Supreme Court said that “forced” religious conversions are “very dangerous” and may “ultimately affect the security of the nation as well as the freedom of religion and conscience of the citizens”.

The Supreme Court views on the Issue

- The bench urged the government to “make their stand clear and file counter on what steps can be taken by Union and/or others to curb such forced conversion, maybe by force, allurements or fraudulent means”.
- The court singles out the issue for its attention, asks what action the government proposes to take, it implies both that “forced” religious conversions are a significant problem and that existing laws are insufficient to deal with it.
- Article 25 of the Constitution says “all persons are equally entitled to freedom of conscience and the right freely to profess, practise and propagate religion”.
- But at least 10 states have legislated anti-conversion laws, beginning in the 1960s.
- The claim is that legal safeguards, including IPC provisions, have failed to stop religious conversions through “coercion”, “intimidation”, “allurement”, “threats”.
- Mass conversions in independent India, though rare, have been acts of protest against social discrimination.
- The conversion of BR Ambedkar and over three lakh followers, mostly Dalits, to Buddhism in 1956 as well as the 1982 Meenakshipuram conversions, when 180 Dalit families in a Tamil Nadu village embraced Islam, were acts of political revolt.
- The current context of the conversion debate appears to be missionary activity in tribal areas and inter-religious marriages, labelled as “love jihad”.

Anti Conversion Laws

- Princely states headed by Hindu royal families were the first to introduce laws restricting religious conversions during the British colonial era, especially during the latter half of the 1930s and 1940s.
- Madhya Pradesh, Uttar Pradesh and Himachal Pradesh passed anti-conversion laws that outlaw religious conversion solely for the purpose of marriage.
- Uttar Pradesh Prohibition of Unlawful Conversion of Religious Ordinance, 2020 also requires a 60-days-notice. However, it also requires the Magistrate to conduct police inquiry to ascertain the real intention behind the conversion
- Under the Madhya Pradesh law, the burden of proving that the conversion was done in a legitimate fashion lies with the person converted.
- Under the law, any marriage where a husband or wife has converted (even consensually) will be declared null and void unless prior notice is given to the state government.

- Recent Karnataka law says any person intending to convert to another religion after the law comes into force will have to notify the district magistrate two months in advance.

Judicial pronouncements on such laws:

- In 2020 the Allahabad High Court cancelled a case against a Muslim man (Salamat Ansari), filed by the parents of his wife (Priyanka Kharwar (now Alia)) who converted to Islam before marrying him.
- The verdict comes as a reminder of the Constitution's cherished values in the backdrop of some state governments bringing in legislations against what they call as "Love Jihad".
- Right to privacy: It held that an individual's ability to control vital aspects of her life inheres in her right to privacy. **Puttaswamy judgement**, has recognised that every individual possesses a guaranteed freedom of thought.
- The Uttarakhand HC, in November 2017, held that conversions for the sake of marriage "a sham" and urged the government to enact the law against such conversions. This became the basis for the Uttarakhand Freedom of Religion Act, 2018.
- Sarala Mudgal case:** The court had held that the religious conversion into Islam by a person from non-Islamic faith is not valid if the conversion is done for the purpose of polygamy.
- Conversion in India is legal but not the conversion made using force/allurement/inducement to convert people. Various Court judgments have made conversion laws a legal one but not the laws which have whimsical/fanciful/arbitrary laws by State. So, there is a clear limit for the State to intervene in the religious conversion, this can be further demarcated by small but significant steps such as model law, enhancing awareness, etc.

ELECTORAL BONDS

- The government has shelled out Rs 9.53 crore of taxpayers' money towards commission and printing costs of the Electoral Bonds (EBs) issued to fund political parties.
- The total amount collected by parties through EBs has gone up to Rs 10,791 crore from various anonymous donors in 22 phases since 2018 when the Electoral Bond Scheme was introduced.
- As many as 93.67 per cent of EBs are in Rs 1 crore denomination.

Electoral Bond Scheme

- The electoral bonds are the non-interest-bearing financial instruments.
- These Electoral bonds allow eligible donors to pay eligible political parties using banks as an intermediary.
- The Electoral Bonds aim to ensure transparency in the funding of political parties.

Eligibility criteria for receiving and donating funds

Eligibility of Political Parties

- Only the political parties registered under Section 29A of the Representation of the People Act, 1951 are eligible to receive funds through Electoral Bonds.
- Further, these registered political parties also have to receive not less than 1% votes in the last Lok Sabha elections or the State Legislative Assembly to receive funds through electoral bonds.

Eligibility of Donors

- Any citizen of India or entities incorporated or established in India can purchase these Electoral Bonds.
- Citizens can buy electoral bonds either singly or jointly with other individuals.

Functioning of the Electoral Bond Scheme

- The State Bank of India (SBI) issues electoral bonds in the months of January, April, July, and October.
- The electoral bonds are available in denominations from Rs 1,000 to Rs 1 crore.
- The donors can buy electoral bonds and transfer them into the accounts of the political parties as a donation. The name of the donor is kept confidential.

- Political parties will create a specific account. This account will be verified by the ECI. The political parties will encash the electoral bonds only in this verified account.
- The bonds will remain valid for 15 days. Within that time, the political parties have to encash the electoral bond in the designated accounts.

Need for Electoral Bonds

- These bonds are aimed to reduce anonymous cash donations made to political parties. In the previous system, the political parties did not disclose the donor, the amount of donations received, etc. These anonymous donations led to the generation of black money in the economy.
- For example, Nearly 70% of the Rs.11,300 crore in political funding came from unknown sources.
- The Electoral bonds encourage political donations of clean money. According to the government, the bonds will encourage political donations from individuals, companies, HUF, religious groups, charities, etc. Since the amount is transferred through the bank, the identity of the donor can be captured by the issuing authority.

Criticism of Electoral Bonds

- **Hindering Right to Know:** Voters will not know which individual, company, or organisation has funded which party, and to what extent. Before the introduction of electoral bonds, political parties had to disclose details of all its donors, who have donated more than Rs 20,000.
- The change infringes the citizen's 'Right to Know' and makes the political class even more unaccountable.
- **Unauthorized Donations:** In a situation where the contribution received through electoral bonds are not reported, it cannot be ascertained whether the political party has taken any donation in violation of provision under Section 29B of the RPA, 1951 which prohibits the political parties from taking donations from government companies and foreign sources.
- **Leading to Crony-Capitalism:** It could become a convenient channel for businesses to round-trip their cash parked in tax havens to political parties for a favour or advantage granted in return for something. Anonymous funding might lead to infusion of black money.
- **Loopholes:** Corporate Entities may not enjoy the benefit of transparency as they might have to disclose the amount donated to the Registrar of Companies; Electoral bonds eliminate the 7.5% cap on company donations which means even loss making companies can make unlimited donations etc.

Supreme Court's Stance on Electoral Bonds:

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

Way-forward

- An alternative to electoral bonds is a National Electoral Fund to which all donors can contribute. The funds can be allocated to political parties in proportion to the votes they get. This will protect the identity of donors. Apart from that, it would also weed out black money from political funding.
- The best way to bring transparency in political funding is to put a complete ban on cash donations by individuals or companies to political parties. (At present Political parties can receive cash donation below Rs.2000)
- Further, India has to consider State funding of political parties. The Indrajit Gupta Committee on State Funding of Elections has supported partial state funding of recognised political parties.
- Further, the government have to amend the changes made in the Finance Act of 2017.

Question: What are the features of Electoral Bond Scheme and its challenges and also suggest alternative ways for funding political parties in India

GOVERNANCE

KALANAMAK RICE

- Kalanamak, a traditional variety of paddy with black husk and strong fragrance, which is considered a gift from Lord Buddha to the people of Sravasti when he visited the region after enlightenment, is all set to get a new look and name.

Kalanamak Rice

- Also known as Buddha Rice, Kalanamak is a scented, one of the finest and short grain rice with an unusual black husk (kala = black; namak means salt).
- It is currently grown in 11 districts of the Terai region of northeastern Uttar Pradesh and in Nepal (specifically Kapilvastu).
- This rare rice has been awarded the Geographical Indication (GI) tag in 2013 which recognised Siddharthnagar and the adjacent districts for the tag.
- Under the One District One Product (ODOP) Scheme, it has earned the Prime Minister's award for Excellence in Public Administration 2021.
- It was featured in the book 'Speciality Rices of the World' by the Food and Agriculture Organization (FAO) of the United Nations.
- The Government of Uttar Pradesh is promoting Kala Namak rice under One District One Product (ODOP) and has sanctioned a project of Rs. 12.00 crore for promotion of Kala Namak rice.
- The Government of India, through Agricultural and Processed Food Products Export Development Authority (APEDA), has taken various initiatives to promote Kala Namak rice .

The dwarf varieties by IARI

- The Indian Agriculture Research Institute (IARI) has successfully developed two dwarf varieties of Kalanamak rice.
- They have been named Pusa Narendra Kalanamak 1638 and Pusa Narendra Kalanamak 1652.
- The new name is in recognition of its association with the Acharya Narendra Dev University of Agriculture and Technology in Ayodhya, for testing the two varieties.
- The problem with the traditional variety of Kalanamak paddy is that it's tall and prone to lodging, which badly impacted grain filling and quality.
- The yield, as a result, fell drastically, and the market for the rice dwindled, too.
- The objective was to bring dwarfness into the variety and make the plant sturdy to prevent lodging.
- They combine the quality of traditional Kalanamak with high-yielding varieties. Its grains are short.
- The breeding programme by bringing the dwarfing genes from the rice variety Bindli Mutant 68, and also the gene of Pusa Basmati 1176 was used as a parent to cross with Kalanamak, and the progenies were further back-crossed with Kalanamak to restore its quality.

Benefits

- This rice is rich in micronutrients such as iron and zinc and can help prevent Alzheimer's
- It also contains 11% protein which is almost double of common rice varieties.
- Besides, it has a low Glycaemic Index (49% to 52%) making it sugar free and suitable for even diabetic people.
- It also contains antioxidants such as anthocyanin which is useful in preventing heart disease and also helps in improving the health of the skin.
- It has also been found helpful in regulating blood pressure and blood-related problems.

TUBERCULOSIS

- The WHO released the Global TB Report 2022 which took into account the impact of the COVID-19 pandemic on the diagnosis, treatment and burden of disease for TB all over the world.

- India's TB incidence for the year 2021 is 210 per 100,000 population – compared to the baseline year of 2015 (incidence was 256 per lakh population in India).
- There has been an 18% decline which is 7 percentage points better than the global average of 11%.

Report Findings

- According to the WHO report an estimated 10.6 million people fell ill with tuberculosis (TB) in 2021, an increase of 4.5% from 2020, and 1.6 million people died from TB (including 187 000 among HIV positive people).
- The organisation's 2022 Global TB report added that the burden of drug-resistant TB (DR-TB) also increased by 3% between 2020 and 2021, with 450 000 new cases of rifampicin-resistant TB (RR-TB) in 2021.
- First time in many years an increase has been reported in the number of people falling ill with TB and drug resistant TB.
- TB services are among many others disrupted by the COVID-19 pandemic in 2021.

Indian Context

- While the COVID-19 pandemic impacted TB Programmes across the world.
- India was able to successfully offset the disruptions caused, through the introduction of critical interventions in 2020 and 2021 –
- This led to the National TB Elimination Programme notifying over 21.4 lakh TB cases – 18% higher than 2020.
- The TB Programme's nutrition support scheme – Ni-kshay Poshan Yojana – has proved critical for the vulnerable.
- Pradhan Mantri TB Mukh Bharat Abhiyan was launched in India to provide additional nutritional support to those on TB treatment, through contributions from community including individuals and organisations.

PARAKH

- Three global educational non-profits — Educational Testing Services (ETS), American Institutes for Research (AIR) and the Australian Council for Educational Research (ACER) — have expressed interest in helping to set up India's first national school-level examination and assessment regulator.
- The organisations approached the National Council of Educational Research and Training (NCERT), responding to an Expression of Interest (EoI) for selecting consulting services to set up the proposed regulator PARAKH (Performance Assessment, Review and Analysis of Knowledge for Holistic Development), which is envisaged as an instrument for “establishing comparative measures and equivalence” among school examination boards and promoting collaboration among them.

PARAKH

- PARAKH will be expected to address the issue of disparities in scores of students affiliated to different boards.
- Also, it will not just conduct future rounds of National Achievement Surveys (NAS) and other surveys on learning outcomes, but also review all aspects of the design and conduct of the NAS 2017/2018 and 2021 exercises and identify areas for improvement.
- Apart from holding NAS and Foundational Learning Study (FLN), PARAKH will also manage India's participation in international assessments like:
- Program for International Student Assessment (PISA),
- Trends in International Mathematics and Science Study (TIMSS),
- Progress in International Reading Literacy Study (PIRLS).

About global educational non-profits

- ETS is internationally recognised for conducting TOEFL (Test of English as a Foreign Language).
- GRE (Graduate Record Examination), which are gateways to higher education in top institutes worldwide.
- AIR and ACER are leading names in research on behavioural and social science domains and learning assessment studies.

- ACER, which is based in Australia, has an Indian wing. It is primarily known for conducting a set of benchmark tests for learning assessment in English, Mathematics and Science for classes III-X.
- AIR shot to fame in the 1960s after it carried out the biggest study of its time among high school students in the US on racial disparities and economic mobility among others.
- NCERT will develop and validate standards of assessment for all school stages and curricular areas of school education, based on NEP 2020.
- It will provide technical guidelines and inputs for boards to design, develop, and implement state-wide systems for measuring student learning aligned with state and national curricular standards

HARIT AAYKAR INITIATIVE

- HARIT Aaykar initiative by Income Tax Department for increasing greenery and creating micro forests.
- The Income Tax Department participated enthusiastically in the Government of India's month-long Special Campaign for Swachhata which ends on 31st October, 2022.
- This day (31st October) marks the birth anniversary of Sardar Vallabhbhai Patel and is also observed as the National Unity Day.

About

- The HARIT Aaykar (Hariyali Achievement Resolution by Income Tax) initiative. Under this initiative, the Department resolves to increase the green cover by planting trees and creating micro-forests in and around Income Tax Department's buildings and other public areas.
- Under the HARIT Aaykar initiative, the first of such micro-forests has been inaugurated.

ONE NATION, ONE ITR FORM

- The Central Board of Direct Taxes (CBDT) has proposed a single income tax return (ITR) form for all taxpayers. A draft form has been released, to which all stakeholders can provide inputs up to December 15.

Kinds of ITR forms

- There are seven kinds of ITR forms, which are used by different categories of taxpayers. They are as follows:
- ITR Form 1, called 'Sahaj', is for small and medium taxpayers. Sahaj forms can be filed by individuals who have an income up to Rs 50 lakh, with earnings from salary, one house property/ other sources (interest etc).
- ITR-2 is filed by people with income from residential property.
- * ITR-3 is intended for people who have income as profits from business/ profession
- ITR-4 (Sugam) is, like ITR-1 (Sahaj), a simple forms, and can be filed by individuals, Hindu Undivided Families (HUFs) and firms with total income up to Rs 50 lakh from business and profession.
- ITR-5 and 6 are for limited liability partnerships (LLPs) and businesses respectively.
- ITR-7 is filed by trusts and non-profit organisations.

What is the change that has been proposed?

- According to the proposal, all taxpayers, barring trusts and non-profit organisations (ITR-7), will be able to use a common ITR form, which will include a separate head for disclosure of income from virtual digital assets.
- "The proposed draft ITR...proposes to introduce a common ITR by merging all the existing returns of income except ITR-7.

Rationale Behind the Proposal

- The proposed draft ITR takes a relook at the return filing system in tandem with international best practices.
- The draft form aims to make it easier to file returns, and to considerably reduce the time taken for the job by individuals and non-business-type taxpayers.
- The taxpayers will not be required to see the schedules that do not apply to them.
- It intends the smart design of schedules in a user-friendly manner with a better arrangement, logical flow, and increased scope of pre-filling.

- It will also facilitate the proper reconciliation of third-party data available with the Income-Tax department vis-à-vis the data to be reported in the ITR to reduce the compliance burden on the taxpayers.
- The proposed ITR form would be customised for taxpayers with applicable schedules, based on certain questions answered by them.
- Once the common ITR form is notified, after taking into account the inputs received from stakeholders, the online utility will be released by the Income Tax department.
- In such a utility, a customised ITR containing only the applicable questions and schedules will be available to the taxpayer.

SCHOOL EDUCATION PERFORMANCE INDEX

- Maharashtra has been ranked first, along with Punjab and Kerala, in the Performance Grading Index (PGI) report for the academic year 2020-21.
- The state has a total score of 928/1000, elevating it to the top position from the eighth rank it had last year.

School Education Performance Index

- The Education Ministry released the latest edition of the Performance Grading Index, which is a new index that measures the performance of states and union territories on a uniform scale to analyse the transformational change in the field of school education.
- There are five parameters on which performances are graded –
 - Learning outcome,
 - Access,
 - Equity,
 - Infrastructure facilities
 - Governance process.
- The PGI report is generated through existing Management Information System platforms such as Unified District Information System for Education (UDISE), National Achievement Survey (NAS) and Mid Day Meal (MDM), from where information is gathered.
- The **infrastructure facilities domain** includes measures such as providing safe infrastructure, working toilets, clean drinking water, clean and attractive spaces, electricity, computing devices, internet, libraries, and sports and recreational resources, among others.
- Indicators like availability of digital facilities, timely availability of textbooks and uniforms — which are critical inputs for better performance of students — are also measured in this domain.
- In the **governance process domain**, which aims to capture the performance of all states/UTs through indicators such as making use of IT instead of human interface.

Performance of Maharashtra

- Maharashtra has been ranked first, along with Punjab and Kerala.
- The state has a total score of 928/1000, elevating it to the top position from the eighth rank it had last year.
- Maharashtra has shown considerable improvement in domains such as infrastructure facilities and governance processes.
- MH's score in infrastructure domain jumped to 143/150 from 126/150 in the year 2019-20.
- MH's score in governance process domain, jumped to 340/360 from only 299/360 last year.

NATIONAL COMMISSION FOR PROTECTION OF CHILD RIGHTS (NCPCR)

- The child rights body has received complaint from an NGO which alleged that the All India Mission was involved in 'illegally converting children in India'
- Amazon India has informed the national child rights body that it had no information regarding funding to the All India Mission which was involved in "unlawful activities" and would get the same from its office in the United States.

National Commission for Protection of Child Rights

- NCPCR is a statutory body constituted under Section 3 of the Commission for Protection of Child Rights (CPCR) Act, 2005 to protect child rights and other related matters in the country.
- The Commission is further mandated to monitor the proper and effective implementation of the Protection of Children from Sexual Offences (POCSO) Act, 2012; Juvenile Justice (Care and Protection of Children) Act, 2015 and the Right to Free and Compulsory Education (RTE) Act, 2009.
- The commission's mandate is to ensure that all laws, policies, programs and administrative systems conform to the vision of the rights of the child as enunciated in the Constitution of India as well as the United Nations Convention on the Rights of the Child.
- It strives to ensure that all laws and policies in the country are in consonance with the rights of children as emphasised by the Indian Constitution as well as with the UN Convention on the Rights of the Child.
- A child is defined as any person between the ages of 0 and 18 years.
- The Commission acknowledges the universality and inviolability of child rights.
- It focuses on children that form a part of the most vulnerable sections of society.
- The Commission sees every right of the child as equally important and hence, does not grade the rights according to importance

Power and Jurisdiction

- All the powers of a civil court trying a suit under the Code of Civil Procedure, 1908 and, in particular, in respect of the following matters, namely:-
- summoning and enforcing the attendance of any person and examining him on oath;
- discovery and production of any document;
- receiving evidence on affidavits;
- requisitioning any public record or copy thereof from any court or office; and issuing commissions for the examination of witnesses or documents.
- The Commission has also the power to forward any case to a Magistrate having jurisdiction to try the same and the Magistrate to whom any such case is forwarded shall proceed to hear the complaint against the accused as if the case has been forwarded to him under section 346 of the Code of Criminal Procedure, 1973 (2 of 1974).

NCPCR Constitution

- The NCPCR has been constituted by the Government as an act of Parliament as mentioned above. Hence, it is a statutory organisation. It consists of the following members
- **Chairperson** – Person of eminence and who has an exemplary record of work in child welfare.

Six members:

- A minimum of two women members.
- Should have experience in the following fields:
- Education
- Child health, care, welfare or child development
- Juvenile justice or care of neglected or marginalized children or children with disabilities
- Elimination of child labour or children in distress
- Child psychology or sociology
- Laws relating to children

ATAL INNOVATION MISSION CENTRE

- Atal Innovation Mission launches women centric challenges under ANIC program
- Innovation Mission of NITI Aayog launched the Women centric challenges under the 2nd edition of Atal New India Challenge (ANIC).
- The Woman centric challenges address the major issues faced by women from all spheres of life.

- These include driving women hygiene through innovation, innovations to improve women's safety, professional networking opportunities for women, innovations that make working mothers' life better, and easing the life of Rural Women.
- The Aayog highlighted that ANIC aims to seek, select, support and nurture technology-based innovations that solve sectoral challenges of national importance and societal relevance through a grant-based mechanism of up to one crore rupees.

Atal Innovation Mission

- It is Government of India's flagship initiative to promote a culture of innovation and entrepreneurship in the country.

AIM's objectives are:

- To develop new programmes and policies for fostering innovation in different sectors of the economy.
- To provide platform and collaboration opportunities for different stakeholders.
- To create awareness.
- To create an umbrella structure to oversee innovation ecosystem of the country.

NAAN MUDHALVAN SCHEME

- Corporates, industrial bodies and chambers of commerce are pitching in to play a crucial role in the Tamil Nadu government's 'Naan Mudhalvan' scheme aimed at equipping college students with industry-relevant skills.

About the scheme

- It is an initiative of Tamil Nadu State government.
- Naan Mudhalvan platform aims to provide dynamic information for college students on courses and relevant information about industry specific skill offerings.
- This will enable the students of Tamilnadu to get training in their chosen field of interest that will help them in achieving their career goals.
- The objective of this scheme is to identify potential training providers, to impart various skill trainings based on current industry gaps.
- Through this flagship program the students will be able to get trained and ensure they get jobs according to their skill sets.

About the Platform:

- Naan Mudhalvan platform aims to provide dynamic information for college students on courses and relevant information about industry specific skill offerings.
- This will enable the students of Tamilnadu to get training in their chosen field of interest that will help them in achieving their career goals.
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- Through this flagship program the students will be able to get trained and ensure they get jobs according to their skill sets.
- Naan Mudhalvan showcases 2000+ institutes and consequent 300+ career pathways.

DIGITAL SHAKTI PROGRAMME

- National Commission for Women launched the latest version of 'Digital Shakti' programme, which was essentially dedicated to teach women to be safe online.
- The latest 4.0 version of its 'Digital Shakti' programme, which was essentially dedicated to teach women to be safe online.
- Seeking to empower women digitally, the National Commission for Women (NCW) is expanding the ambit of its cyber-security programme to enable females on using the digital space to enhance their career prospects, and use technology to their advantage.

About Digital Shakti' programme

- It is a cyber-safety programme, launched by NCW in 2018 essentially to train women fight cyber-crime and to help females use digital space.
- CyberPeace Foundation is partnering with the NCW and Meta to implement the programme.
- The 4.0 version aims at accelerating the digital participation of women
- To train one million women from schools, colleges and universities apart from housewives to use the digital knowledge responsibly and support them if they have any business ideas for example for start-up
- To upskill and empower women digitally
- Through this project, over 3 lakh women across India have been made aware of the cyber safety tips and tricks, the reporting and redressal mechanisms, data privacy and the usage of technology, for their benefits.

THE SECURITIES APPELLATE TRIBUNAL (SAT)

- The Securities Appellate Tribunal (SAT) has upheld the order of insurance regulator IRDAI directing Go Digit General Insurance to discontinue the product "Digit Group Total Protect Policy" as the product falls under the purview of life insurance which could not be offered by a general insurance company.
- Any person who wishes to carry on insurance business can do so provided that the person gets a registration of a particular class of insurance business under Section 3 of the Insurance Act read with Clause 4 of the Regulations of 2000.

Securities Appellate Tribunal(SAT)

- Securities Appellate Tribunal (SAT) is a statutory body established under the provisions of Section 15K of the Securities and Exchange Board of India Act,1992.
- It's headquarters is at Mumbai.
- The mandate of SAT is to hear and dispose of appeals against the orders passed by the
- Securities and Exchange Board of India (SEBI) (b)
- Pension Fund Regulatory and Development Authority (PFRDA)
- Insurance Regulatory Development Authority of India (IRDAI).
- SAT consists of a Presiding Officer & two other members.
- The Presiding officer of SAT shall be appointed by the Central Government in consultation with the Chief Justice of India or his nominee.

Powers and Functions

- It has the same powers as vested in a civil court. Further, if any person feels aggrieved by SAT's decision or order can appeal to the Supreme Court.
- To hear and dispose of appeals against orders passed by the SEBI or by an adjudicating officer under the SEBI Act,1992.
- To hear and dispose of appeals against orders passed by the Pension Fund Regulatory and Development Authority (PFRDA).
- To hear and dispose of appeals against orders passed by the Insurance Regulatory Development Authority of India (IRDAI).

The Insurance Regulatory and Development Authority of India (IRDAI)

- It is an independent statutory body that was set up under the IRDA Act,1999.
- It is under the jurisdiction of Ministry of Finance.
- It is tasked with regulating and licensing the insurance and re-insurance industries in India.
- To protect the interests of the insurance policyholders and to develop and regulates the insurance industry. It issues advisories regularly to insurance companies regarding the changes in rules and regulations.
- The agency's headquarters are in Hyderabad, Telangana, where it moved from Delhi in 2001.
- IRDAI is a 10-member body including the chairman, five full-time and four part-time members appointed by the government of India.

Main Objectives

- To ensure fair treatment and protect the interests of the policyholder.
- To regulate the insurance companies and ensuring the industry's financial soundness.
- To formulate standards and regulations so that there is no ambiguity

Functions

- Granting, renewing, cancelling or modifying the registration of insurance companies.
- Levying charges and fees as per the IRDA act.
- Conducting investigation, inspection, audit, etc. of insurance companies and other organizations in the insurance industry.
- Specifying the code of conduct and providing qualifications and training to intermediaries, insurance agents etc.
- Regulating and controlling the insurance premium rates, terms and conditions and other benefits offered by insurers.
- Provides a grievance redressal forum and protecting interests of the policyholder.

'TOILETS 2.0' CAMPAIGN

- Union Minister of Housing and Urban Affairs (MoHUA) launched Toilets 2.0 campaign at a national event organised at Bengaluru, Karnataka on the occasion of World Toilet Day 2022.
- The campaign aims to change the face of public and community toilets in urban India through collective action involving citizens and Urban Local Bodies.
- India is set to go beyond the Open Defecation Free (ODF) narrative. Clean and safe public restrooms and public spaces will improve the experience and quality of public life.

The campaign has five thematic areas —

- 'People for Toilets' that will focus on cleaning and maintaining community and public toilets,
- 'Partners for Toilets' aimed at the adoption of public toilets,
- A design challenge under the 'Design Toilets' theme,
- 'Rate your Toilet' for the promotion of user feedback to improve public toilets
- 'My thoughts - Our Toilets' that will seek to gather public opinion for toilets.
- **The People for Toilets program** is an inter-city competition envisaged for cleaning and maintaining community and public toilets in which top-performing cities will be recognised.
- The objective of the **Partners for Toilets theme** is to forge partnerships with potential organisations for the adoption of community and public toilets for interim cleaning, annual operations and maintenance, one-time financial aid, beautification activities, innovation and feedback among others.
- **The Design Challenge** is being organised in collaboration with the Council of Architecture through which entries will be invited from students of architecture and practising architects on designs for aspirational toilets in the two categories of Public toilets and Community toilets. The top designs will be turned into a compendium for cities' consideration to adopt for their facilities.
- **Rate your Toilet** is for promoting user feedback to improve public and community toilets, while My thoughts - Our Toilets is a general public survey among citizens on public toilets across the country.
- A questionnaire on citizen aspiration for toilets will be available on MyGov platform for the public to answer. The results from the survey are expected to help States and cities to understand gaps and provide course corrective measures.
- The campaign will energise and bring States, cities and citizens together to take forward a rich sanitation legacy under the Swachh Bharat Mission that will script the Toilets 2.0 journey of India.

CENTRAL DEPOSITORIES SERVICES INDIA LTD (CDSL)

- Certain services at CDSL were disrupted due to a suspected cyber attack over the weekend.

What is CDSL?

- CDSL was founded in 1999.
- CDSL, or Central Depositories Services India Ltd, is a government-registered share depository, alongside its other state-owned counterpart National Securities Depository Ltd (NSDL).
- Share depositories hold shares in an electronic or dematerialised form and are an enabler for securities transactions, playing a somewhat similar role to what banks play in handling cash and fixed deposits.
- While banks help customers keep their cash in electronic form, share depositories help consumers store shares in a dematerialised form.
- It is a Market Infrastructure Institution or MII that is deemed as a crucial part of the capital market structure, providing services to all market participants, including exchanges, clearing corporations, depository participants, issuers and investors.
- Arth is a CSR Initiative from Central Depository Services (India) Ltd. with a mission to make financial education simple and accessible for all.
- Regulation: The Depository Act of 1996 regulates the establishment and operation of a depository in India.
- SEBI is the governing body that regulates the functioning of any depository.

About National Securities Depository Limited (NSDL)

- NSDL is India's first & largest depository.
- It was set up on November 8, 1996, formed with the purpose of handling the securities held in dematerialized form in the Indian capital market.
- National Securities Depository Limited (NSDL) is promoted by the National Stock Exchange, Industrial Development Bank of India, and Unit Trust of India.

Benefits of Share Depository:

- Depository holds security in electronic form, allowing for its easy transfer between seller and buyer.
- Depository maintains and safeguards the securities on behalf of the investors. These investors do not need to spend time on its maintenance.
- Depositories offer mortgages or loans against securities held by investors which may be used for the purchase of other securities.
- The process of investment in share market has been simplified with the introduction of depository. There is no need for the procedure to change ownership.
- The depository enables T-2 rolling settlement, which is faster than the traditional method using physical share certificate.
- Transfer of securities through depositories reduces the back office paper work. As a result, the brokerage charged by brokers is also reduced considerably.

SANGEET NATAK AKADEMI

- The Sangeet Natak Akademi has bestowed special one-time awards commemorating 75 years of India's independence on 86 artistes, apart from selecting 128 performing artistes from various fields for its regular annual awards for the years 2019-21.

Sangeet Natak Akademi

- Sangeet Natak Akademi, the apex body in the field of performing arts in the country, was set up in 1953 for the preservation and promotion of the vast intangible heritage of India's diverse culture expressed in forms of music, dance and drama.
- The management of the Akademi vests in its General Council. The Chairman of the Akademi is appointed by the President of India for a term of five years.
- The functions of the Akademi are set down in the Akademi's Memorandum of Association, adopted at its registration as a society on 11 September 1961.
- The registered office of the Akademi is at Rabindra Bhavan, New Delhi.
- Sangeet Natak Akademi is an autonomous body of the Ministry of Culture, Government of India.
- Sangeet Natak Akademi now has three constituent units, two of these being dance-teaching institutions: the Jawaharlal Nehru Manipur Dance Academy (JNMDA) at Imphal, and Kathak Kendra in Delhi.

The Sangeet Natak Akademi confers classical status on nine Indian dance forms:

- Bharatanatyam: Tamil Nadu
- Kathak: Northern India
- Kathakali: Kerala
- Kuchipudi: Andhra Pradesh
- Manipuri: Manipur
- Mohiniaattam: Kerala
- Odissi: Odisha
- Sattriya: Assam
- Chhau: Odisha

Question: Differentiate the characteristics of Kathak and Kathakali dance.

THE CENTRE FOR DEVELOPMENT OF TELEMATICS (C-DOT)

- The government of India has approved a Rs 124 crore proposal for setting up incubation centres in the Delhi and Bengaluru campuses of the Centre for Development of Telematics (C-DoT) under the Digital Communication Innovation Square (DCIS) under Champion Services Sector Scheme.

About the Centre for Development of Telematics (C-DOT)

- C-DOT was established in 1984 as an autonomous Telecom R&D centre of DoT, Government of India.
- It is a registered society under the Societies Registration Act, 1860.
- It is a registered 'public funded research institution' with the Department of Scientific and Industrial Research (DSIR), Ministry of Science & Technology.
- This will act as a catalyst resulting in indigenous design, development, manufacturing and deployment of cost-effective 5G products and solutions
- This will bring the technical competencies and complementary strengths of Indian R&D and industry into a single unified platform leading to the creation of indigenous Intellectual Property (IP) assets that can generate new avenues for wider reach and commercialization of home-grown technologies at the global level
- The Centre for Development of Telematics (C-DOT) is the premier R&D centre of the Department of Telecommunications, Ministry of Communications, Government of India
- C-DOT has indigenously designed and developed various cutting-edge Telecom technologies spanning Optical, Switching & Routing, Wireless, Security and a host of Telecom Software applications
- C-DOT has developed its indigenous 4G solution and is keenly working in the area of 5G.
- C-DOT reiterates its unequivocal commitment to the betterment of country's telecom sector by working towards realizing the objectives of various flagship programs of the Government of India that include Digital India, Make in India, BharatNet, Skill India, Startup India and Smart Cities.
- Chairman: Union Minister of Communication & IT
- Vice Chairman: Union Minister of State for Communication & IT
- Members: 10 other members from various ministries and telecom sectors
- Customer Segments: Defence organizations & Strategic agencies, public sector / Govt. , Educational institutions, Manufacturing sector / Toll Operate Transfer partners, TSPs and ISPs etc.

Success stories of C-DOT:**Launch of Gyan Setu and MAXNG Technologies:**

- 'GyanSetu' is an internet based real-time ICT system designed by C-DOT, primarily to provide various e services to the under privileged rural population of India.
- MAX-NG, C-DOT's Next Generation Network (NGN) solution addresses the needs of the changing telecom scenario and enables a smooth transition from Plain Old Telephone System (POTS) to NGN based Voiceover-IP (VoIP).

Launch of Broadband Products:

- During Digital India Week, C-DOT launched four products and inaugurated IMS compliant NGN Services in MTNL network.
- High Speed, long distance Wi-Fi solution is Ideal for increasing the penetration of broadband services in difficult and inaccessible terrains e.g., hilly areas, dense vegetation, islands, unconnected villages. disaster sites, border areas, tunnels, Battlefield Surveillance.

Inauguration of Terabit Router & FTTH Solution:

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

Question: Discuss the telecom sector after the introduction of LPG reforms in 1990's.



CivilsTap Himachal

INTERNATION RELATIONS

THE BLACK SEA GRAIN INITIATIVE

- Russia has re-joined the Black Sea Grain deal. The Black Sea Grain deal endeavours to tackle escalating food prices emanating from supply chain disruptions because of Russia's actions in the world's 'breadbasket'.

What is the Black Sea Grain Initiative?

- The Black Sea Grain deal endeavours to tackle escalating food prices emanating from supply chain disruptions because of Russia's actions in the world's 'breadbasket'.
- The deal, brokered by the UN and Turkey, was signed in Istanbul on July 22 this year.
- Initially stipulated for a period of 120 days, with an option to extend or terminate after November, the deal was to provide for a safe maritime humanitarian corridor for Ukrainian exports (particularly for food grains) from three of its key ports, namely, Chornomorsk, Odesa and Yuzhny/Pivdennyi.
- The central idea was to calm markets by ensuring an adequate supply of grains, thereby limiting food price inflation.
- Ukraine is among the largest exporters of wheat, maize, rapeseed, sunflower seeds and sunflower oil, globally.
- Its access to the deep-sea ports in the Black Sea enables it to directly approach Russia and Europe along with grain importers from West Asia and North Africa.
- Russia's actions in the East European country had disturbed this route which earlier used to ship 75% of its agricultural exports — precisely what the initiative sought to address.

Why is it important?

- As per the UN Office for Coordination of Humanitarian Affairs, approximately 10.1 million tonnes of grains have been shipped since the initiative commenced.
- The UN Food and Agricultural Organisation's (FAO) Food Price Index, which assesses the monthly change in international prices of a basket of food commodities, fell for the sixth consecutive month in a row during the September assessment period.
- It was earlier inferred that the supply situation in markets was seen to be easing, with potential for further price drops.
- People hoarding the grain in the hope of selling it for a sizeable profit owing to the supply crunch were obligated to sell. The initiative has also been credited for having made a "huge difference" to the global cost of living crisis.
- About 44% of the shipments, which include corn, wheat, rapeseed, and sunflower oil among others, reached high-income countries (including Spain, Netherlands and Italy among others), 28% reached low and lower-middle-income countries (Egypt, Iran, Sudan and Kenya among others) and 27% reached upper-middle income countries (China and Bulgaria among others).

Current status of the Black Sea Grain Initiative

- Black Sea Grain deal set to expire on November 19, 2022.
- The renewal negotiations were led by the United Nations throughout October 2022.
- However, Russia pulled out of this agreement on October 29 due to drone attack on its naval ships in the port of Sevastopol.
- Despite Russia withdrawing from the deal, several grain ships continued to depart from ports in Ukraine with support from Turkey and UN.

G20 Logo

- Prime Minister unveiled the logo, theme and website of India's G20 presidency. The logo bears a lotus and the message of '**Vasudhaiva Kutumbakam — One Earth, One Family, One Future**'.

- India will assume the presidency of the powerful G20 grouping from the current chair, Indonesia, on December 1, and hold the post for a year. The G20 Leaders' Summit at the level of Heads of State/Government is scheduled to be held on September 9 and 10, 2023 in New Delhi.

Significance of the G20 logo

- The logo is not just a symbol, but a message and a resolve.
- "This G20 logo is not just a symbol, it is a message, an emotion running through our veins.
- It is a resolve, which is now being included in our thoughts..
- The logo reflects our idea of Vasudhaiva Kutumbakam (the whole earth is a family), because of which India has always believed in global harmony.
- "The lotus flower symbolises our Puranic heritage, our aashta (belief) and boddhikta (intellectualism),"

G20

- The G20 was formed in 1999 in the backdrop of the financial crisis of the late 1990s that hit East Asia and Southeast Asia in particular.
- Its aim was to secure global financial stability by involving middle-income countries.
- Its prominent members are: Australia, Brazil, China, France, Germany, India, Japan, Republic of Korea, Russia, Saudi Arabia, South Africa, Turkey, the UK, the US, and the EU. Spain is invited as a permanent guest.
- "G20 is the premier forum for international economic cooperation representing around 85 per cent of the global GDP, over 75 per cent of the global trade, and about two-thirds of the world population.

How does the G20 work?

- The G20 has no permanent secretariat.
- The agenda and work are coordinated by representatives of the G20 countries, known as 'Sherpas', who work together with the finance ministers and governors of the central banks. India has announced that ex-NITI Aayog CEO Amitabh Kant would be the G20 Sherpa after Piyush Goyal.
- On the advice of the G7 Finance Ministers, the G20 Finance Ministers and Central Bank Governors began holding meetings to discuss the response to the global financial crisis that occurred.
- Since 1999, an annual meeting of finance ministers has taken place.
- The first G20 Summit took place in 2008 in Washington DC, US.
- In addition to Summits, the Sherpa meetings (that help in negotiations and building consensus), and other events are also organised throughout the year.
- Each year, the presidency invites guest countries.

G20 Presidency

- India will assume the presidency of the powerful G20 grouping from the current chair, Indonesia, on December 1, and hold the post for a year.
- The G20 Leaders' Summit at the level of Heads of State/Government is scheduled to be held on September 2023.
- The presidency of the G20 rotates every year among members, and the country holding the presidency, together with the previous and next presidency-holder, forms the 'Troika' to ensure continuity of the G20 agenda.
- During India's presidency, India, Indonesia and Brazil will form the troika.
- This would be the first time when the troika would consist of three developing countries and emerging economies.
- During the course of its G20 Presidency, India will be holding about 200 meetings in 32 different sectors in multiple locations across India.

MOSCOW FORMAT CONSULTATIONS ON AFGHANISTAN

- India participated in the fourth meeting of the Moscow Format Consultations on Afghanistan held in Moscow on 16th November 2022. The meeting saw participation from special envoys and senior officials from Russia, China, Pakistan, Iran, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

What is Moscow Format?

- Moscow format is one of the several dialogue platforms on Afghanistan which began before the Taliban takeover of Kabul.
- The format consists of Russia, China, Pakistan, Iran, Kazakhstan, Tajikistan, Kyrgyzstan, Uzbekistan, Turkmenistan and India.

The issues discussed at the 4th Moscow Format

The participants discussed issues related to Afghanistan. These include

- The current humanitarian situation and the ongoing efforts of various stakeholders to provide assistance,
- Intra-Afghan talks,
- The formation of an inclusive and representative government and
- Efforts to counter threats of terrorism and ensure regional security.

About Moscow Format Consultations on Afghanistan:

- The Moscow Format Consultations on Afghanistan, launched in 2017, is a regional platform on Afghanistan involving the special envoys of Russia, Afghanistan, India, Iran, China, and Pakistan.
- Its mandate is to facilitate political reconciliation between the then-internationally backed Kabul government and the Taliban, establish peace, and ensure regional security.
- Moscow assumed the lead in this process based on its national concerns and interests in Afghanistan, most notably on two key issues.
- The first issue was centred around the potential threats due to the spread of instability, violence, and extremism in Afghanistan and the rest of Central Asia.
- The second was related to the growing inflow of Afghan heroin to the Russian market. Geopolitical interests related to Moscow's opposition to any US or Western security presence in Central Asia undergirds Russia's motives to lead such processes.
- April 2017 saw the first round of consultations with Russia, Afghanistan, India, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan in attendance.

NORTH ATLANTIC TREATY ORGANISATION (NATO)

- NATO, the Western defensive military alliance led by the United States, that a Russian missile killed two of its citizens.
- Polish Prime Minister had said that the country was considering whether it should launch NATO's Article 4 procedure.
- Any attack on Poland, a NATO member, could drag the 30-nation strong alliance into the Russia-Ukraine conflict, risking a full-fledged nuclear war.

What is NATO?

- The North Atlantic Treaty Organisation came into being after World War II as a counter to the Soviet Union's possible expansion attempts in Europe.
- Then-US President Harry S Truman signed the 12-member treaty on April 4, 1949.
- After the collapse of USSR in 1991, several eastern European nations previously members of the Soviet Union joined NATO.
- As of now, NATO comprise 30 members — Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, the United States, Greece, Turkey, Germany, Spain, Czechia, Hungary, Poland, Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, Slovenia, Albania, Croatia, Montenegro, and North Macedonia.
- Following the Russian invasion of Ukraine, Finland and Sweden applied for NATO membership and were invited to join the collective by 28 of the 30 members, with Turkey and Hungary being notable exceptions.
- Bosnia and Herzegovina and Georgia have expressed interest in joining the collective as well.

NATO's Core Duties

- The NATO works on a collective defense principle and routinely undertakes exercises to strengthen their territorial, naval, and air forces.
- NATO members also arm themselves to face evolving methods of attacks like cybercrimes, and have participated in military operations in Bosnia and Herzegovina, Kosova, Afghanistan, Iraq, Libya and Syria, among others.
- **Article 4** of the treaty mandates that the member nations consult each other when faced with threat.
- **Article 5 spells out** the 'one-for-all, all-for-one' nature of the treaty. It reads
- In exercise of the right of individual or collective self-defence recognised by **Article 51 of the Charter of the United Nations**, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic area."

Rivalry that goes way back

- NATO and Russia have always been at odds with each other, since the treaty was signed to keep Russian expansionism at bay.
- When NATO came into existence, Soviet Union had sought to counter this Western alliance with a defence collective of its own and signed the Warsaw Pact with Poland, Czechoslovakia, Albania, Bulgaria, East Germany, Hungary, and Romania during the Cold War. However, this pact was gradually dissolved after the war ended and its existing member nations eventually joined the NATO.
- The expansion of NATO from 12 to 30 members has been a source of tension between Russia and the West for years.
- In Europe, Russia shares a border with Sweden, Finland, Estonia, Latvia, Lithuania, Poland, Belarus, Ukraine, and Georgia. Of this, apart from Belarus and Ukraine, the others have either joined NATO or are in queue for a membership.
- Russia sees the presence of Western military and nuclear bases in its neighbourhood as a threat.

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

- India wins the International Electrotechnical Commission (IEC) Vice Presidency and Strategic Management Board (SMB) Chair for the 2023-25 term.
- By securing over 90% of the votes cast by full members of International Electrotechnical Commission (IEC) during its General Meeting held recently in San Francisco, USA, India's representative, a member of the Indian National Committee of the International Electrotechnical Commission (IEC) and various technical committees of Bureau of Indian Standards (BIS-India), was elected.
- International Electrotechnical Commission (IEC) is an international standard setting body that publishes international Standards for all electrical, electronic and related technologies.
- Standardization Management Board (SMB) is an apex governance body of IEC responsible for technical policy matters.

International Electrotechnical Commission(IEC)

- Founded in: 1906
- It is the world's leading organization for the preparation and publication of international standards for all electrical, electronic and related technologies. These are known collectively as "electrotechnology".
- It is a global, not-for-profit membership organization that brings together 173 countries and coordinates the work of 20,000 experts globally.
- Headquarters: Geneva, Switzerland

All electrotechnologies are covered by IEC Standards, including:

- energy production and distribution,
- electronics,
- magnetics and electromagnetics,
- electroacoustics,
- multimedia,

- telecommunication and medical technology,
- terminology and symbols,
- electromagnetic compatibility,
- measurement and performance,
- dependability,
- design and development,
- safety and the environment.



GENERAL STUDIES 3.

INDIAN ECONOMY

MANUFACTURING PURCHASING MANAGERS' INDEX (PMI)

- India's manufacturing industry remained robust and expanded at a faster pace in October indicating a strong improvement in the health of the sector.
- The seasonally adjusted S&P Global India Manufacturing Purchasing Managers' Index (PMI) rose to 55.3 in October from 55.1 in September.
- While a reading above 50 indicates an overall expansion compared to the previous month, a print below 50 shows an overall decrease.
- The index is compiled by S&P Global from responses to questionnaires sent to purchasing managers in a panel of around 400 manufacturers.
- The upward movement in the October headline figure largely reflected stronger increases in employment and stocks of purchases.
- Firms were again able to secure additional work, taking the current sequence of growth to 16 months.
- Overall, factory orders increased at an above-trend pace that was nonetheless the weakest since June.
- Capacities were again expanded to accommodate for improving sales.
- Production likewise expanded at a slower rate at the start of the third fiscal quarter

The Purchasing Managers Index (PMI)

- PMI or a Purchasing Managers' Index (PMI) is an indicator of business activity — both in the manufacturing and services sectors.
- It is a survey-based measure that asks the respondents about changes in their perception of some key business variables from the month before.
- It is calculated separately for the manufacturing and services sectors and then a composite index is constructed.
- The index is compiled by S&P Global from responses to questionnaires sent to purchasing managers in a panel of around 400 manufacturers.
- The PMI is derived from a series of qualitative questions. Executives from a reasonably big sample, running into hundreds of firms, are asked whether key indicators such as output, new orders, business expectations and employment were stronger than the month before and are asked to rate them
- A figure above 50 denotes expansion in business activity. Anything below 50 denotes contraction.
- The PMI is usually released at the start of the month, much before most of the official data on industrial output, manufacturing and GDP growth becomes available. It is, therefore, considered a good leading indicator of economic activity and of industrial output
- Central banks of many countries also use the index to help make decisions on interest rates.
- The PMI also gives an indication of corporate earnings and is closely watched by investors as well as the bond markets.

INDIA INFRASTRUCTURE PROJECT DEVELOPMENT FUND SCHEME

- The Department of Economic Affairs (DEA), Ministry of Finance, Government of India, notifies Scheme for Financial Support for Project Development Expenses of PPP Projects – India Infrastructure Project Development Fund Scheme (IIPDF Scheme)
- DEA is laying great thrust on improving the quality and pace of infrastructure development in the country by encouraging private sector participation in the infrastructure sector.
- The DEA has been actively engaged in developing the appropriate policy framework for private investment in infrastructure development.

- Public Private Partnerships (PPPs) are being encouraged to bring private capital and efficiency in execution and operation of infrastructure projects.
- DEA has come out with Scheme for Financial Support for Project Development Expenses of PPP Projects – ‘IIPDF Scheme’ (India Infrastructure Project Development Fund Scheme) for providing necessary support to the PSAs, both in the Central and State Governments, by extending financial assistance in meeting the cost of transaction advisors and consultants engaged in the development of PPP projects.
- It is a Central Sector Scheme.
- Funding under IIPDF Scheme is in addition to the already operational Scheme for Financial Support to PPPs in Infrastructure (Viability Gap Funding Scheme).
- Through the VGF scheme infrastructure projects undertaken through PPP mode that are economically justified but commercially unviable are supported.

EUROPEAN SECURITIES AND MARKETS AUTHORITY (ESMA)

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

These six CCPs are :

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

What’s the role of CCP?

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

The reason for derecognition

- The ESMA reviewed the recognition of all third country CCPs (TC-CCPs) that had been recognised prior to September 21, 2020, as per the European Market Infrastructure Regulation (EMIR) regime.
- The decision to derecognise Indian CCPs came due to ‘no cooperation arrangements’ between the ESMA and Indian regulators — the Reserve Bank of India (RBI), the Securities and Exchange Board of India (SEBI) and the International Financial Services Centres Authority (IFSCA).
- The ESMA wants to supervise these CCPs, which the Indian regulators are not in favour of as they feel that these entities have robust risk management and there is no need for a foreign regulator to inspect them.

Timeline has ESMA given

- The EU regulator will defer the application of the withdrawal decisions until April 30, 2023 to mitigate the adverse impact of the move on EU market participants.
- It will also give the ESMA and the Indian regulators six months’ time to negotiate and come to a consensus.
- While Sebi has reached a fairly advanced level of understanding with the ESMA, the RBI is yet to work out any agreement.

How will the derecognition impact European banks?

- As of the date of application of the withdrawal decisions, these TC-CCPs will no longer be able to provide services to clearing members and trading venues established in the EU.
- Some of the major European banks dealing in the domestic forex, forward, swap and equities and commodities markets.
- The derecognition will impact these lenders as they will not be able to provide clearing and settlement facilities to their clients.
- They will also have to set aside additional capital to trade in the domestic market.
- Of the total foreign portfolio investors (FPI) registered in India, close to 20 per cent.

About ESMA

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

SOVEREIGN GREEN BONDS

- The government gave nod to the final sovereign green bonds framework in line with the Budget announcement.
- The issuance of green bonds, which are intended to raise funds for public sector projects to help in reducing carbon intensity of the economy.

Green Bonds

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

Projects under Green Bonds

- The proceeds from the green bonds, which are a part of the scheduled borrowing plan of the government would be used to fund
 - Renewable energy,
 - Energy efficiency,
 - Clean transportation,
 - Water and waste management,
 - Pollution prevention and control and
 - Green buildings among others.

Projects excluded from the framework.

- Nuclear power generation,
- Landfill projects,
- Alcohol/weapons/tobacco/gaming/palm oil industries
- Hydropower plants larger than 25 MW
- All eligible 'green expenditures' will include public expenditure by the government in the form of investment, subsidies, grant-in-aids, or tax foregone or select operational expenditures, R&D expenditures in public sector projects that help in reducing the carbon intensity of the economy.
- Equity is allowed only in the sole case of metro projects under the 'Clean Transportation' category.

Sovereign Green Bonds Framework

- **Aim:** To mobilize Rs 16,000 crore through the issuance of green bonds in the current fiscal ending March 2023.
- **Under the framework,** the Finance Ministry will, every year, inform the RBI about spending on green projects for which the funds raised through these bonds will be used.
- The Ministry of Finance has constituted a Green Finance Working Committee (GFWC) including members from relevant line ministries and chaired by the Chief Economic Advisor.
- **Eligible Sectors:** The proceeds from the green bonds would be used to fund renewable energy, energy efficiency, clean transportation, water and waste management, pollution prevention and control and green buildings among others.
- **Excluded sectors:** Nuclear power generation, landfill projects, alcohol/weapons/tobacco/gaming/palm oil industries and hydropower plants larger than 25 MW have been excluded from the framework.
- The proceeds from the issuance of the green bond will be deposited in the Consolidated Fund of India (CFI) in line with the regular treasury policy, and then funds from the CFI will be made available for the eligible green projects.

CURRENCY MONITORING LIST

- The United States Department of Treasury has taken off India's name from the from its Currency Monitoring List of major trading partners. In its biannual report to Congress, the US' Treasury Department conveyed that along with India, it had also removed Mexico, Thailand, Italy and Vietnam from the list. With this, seven economies that are now on the current monitoring list include Japan, China, Korea, Singapore, Germany, Malaysia and Taiwan.

US' Currency Monitoring List

- The Currency Monitoring List closely follows the currency policies of some of the US' major trade partners.
- If a country appears on the list, it is regarded as a "currency manipulator".
- A 'currency manipulator' is a designation that the US government authorities give to countries that according to the US, engage in "unfair currency practices" for trade benefits.
- Thus, inclusion in the list simply means that the country is artificially lowering the value of its currency to get an advantage over others.
- This is because a lower currency value leads to reduced export costs from that country.
- The status is reported by the US Department of Treasury in form of a semi-annual report in which it tracks global economic developments and reviews foreign exchange rates.
- It also closely monitors and reviews the currency practices of 20 major trading partners of the US.

What does it mean?

- Removal of India from the list by the US' Treasury Department can be seen as a positive news both in terms of market aspect and India's monetary policy-making.
- If Indian market experts are to be believed, the development means that the Reserve Bank of India (RBI) can now take robust measures to manage the exchange rates effectively, without being tagged as a currency manipulator.
- This may also be a big win from a markets standpoint and also signifies the growing role of India in global growth.
- To manage exchange rates amid the rupee fall, the Reserve Bank of India had recently taken measures like greater purchases of dollars at the time of excess inflows and selling dollars at the time of outflows.
- Experts are also seeing this as a good news from a view-point that the Rupee could appreciate on account of this.

Reasons for removal of India from the list:

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

Three Criteria of the Currency Monitoring List

- The US treasury usually puts a country's name on the list if the said nation has intervened in the currency market by higher levels than 2% of its GDP over a year, and had a current account surplus above a stipulated level.
- Its net purchases of foreign currency, too, also need to exceed 2% of GDP over one year.
- A country that meets two of the three criteria in the Trade Facilitation and Trade Enforcement Act of 2015 gets included in the list.
- If the country meets all three criteria. it gets termed as 'currency manipulator' by the US Department of Treasury.
- Once a country appears on the currency monitoring list, it will remain there for at least two consecutive reports "to help ensure that any improvement in performance versus the criteria is durable and is not due to temporary factors".



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SECURITY ISSUES

OPERATION SEA VIGIL

- Recently the third edition of the 'pan-India' coastal defence Exercise 'Sea Vigil-22' is conducted by the Indian Navy.
- To enhance India's maritime security the two-day long multi-exercise covered the 7,516 km-long coastline of the country.
- Along with covering India's coastline, the exercise also took place in the exclusive economic zone.
- With the collaborative participation of the Indian Navy, Coast Guard, Customs department, and other maritime agencies, Sea Vigil helped in validating the maritime security mechanism.

Operation Sea Vigil

- Exercise Sea Vigil is a Coastal Defence Exercise conceptualized in 2018 to validate various measures that have been instituted towards enhancing maritime security since '26/11'.
- The exercise will be undertaken along the entire 7516 km coastline and Exclusive Economic Zone of India.
- All the Coastal States and Union territories along with other maritime stakeholders.
- Its objective is to provide a realistic assessment of India's strengths and weaknesses and thus will help in further strengthening Maritime and National Security.
- Indian Navy in coordination with the Coast Guard and other ministries entrusted with the task of maritime activities.
- Sea Vigil and TROPEX together will cover the entire spectrum Maritime Security challenges.
- Theatre Level Readiness Operational Exercise (TROPEX) is an inter-service military exercise conducted every two years.

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SCIENCE AND TECHNOLOGY

SALMONELLA

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

About Salmonella Typhimurium:

- Salmonella is a group of bacteria that can cause food-borne illnesses known as salmonellosis.
- Salmonella bacteria typically live in animal and human intestines and are shed through feces. Humans become infected most frequently through contaminated water or food.
- The symptoms of Salmonella include nausea, diarrhoea, fever, and abdominal cramps 12-72 hours after contracting the infection
- Salmonella Typhimurium can be transferred to humans through raw or undercooked infected food including meat and eggs.
- Salmonella Typhimurium causes gastroenteritis (inflammation of the gut).
- Salmonella typhimurium ST313, an invasive non-typhoidal Salmonella serovar, causes bloodstream infection in the malnourished and immunocompromised population of sub-Saharan Africa.
- Recent studies have reported the emergence of multi-drug resistant (MDR) phenotype in Salmonella typhimurium DT104, which causes infection in humans and cattle.

ONEWEB SATELLITES

- Describing the simultaneous placement of 36 OneWeb satellites in space a week ago as a major feat, Prime Minister said the move would strengthen digital connectivity across the whole country.

One Web

- OneWeb is a global communications company that aims to deliver broadband satellite Internet around the world through its fleet of LEO satellites.
- OneWeb satellites are built at a OneWeb and Airbus joint venture facility in Florida that can produce up to two satellites a day.
- The launch roll-out of the satellites is facilitated by French company Arianespace using Russian-made Soyuz rockets.

OneWeb Satellite

- A set of 36 satellites of the UK-based Network Access Associated Ltd (OneWeb).
- It is a global communications network, powered from space, enabling connectivity for governments, businesses, and communities.
- OneWeb has teamed up with NewSpace India Limited (NSIL), the commercial arm of national space agency Indian Space Research Organisation (ISRO) to facilitate the launch.

OneWeb Constellation Summary

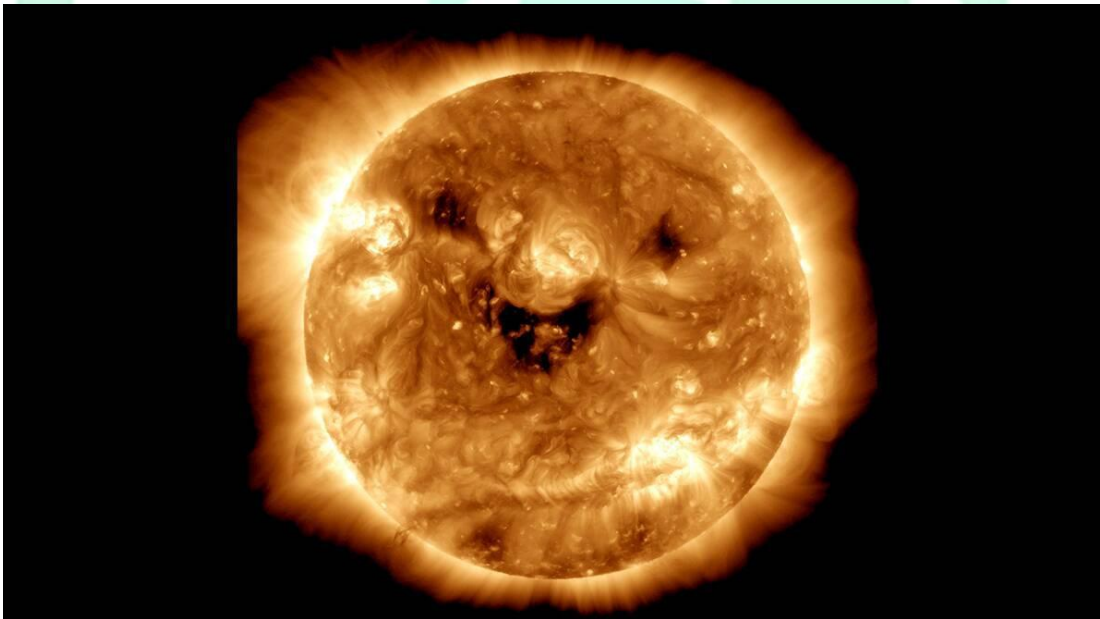
- OneWeb Constellation operates in a LEO Polar Orbit
- Satellites are arranged in 12 rings (Orbital planes) with 49 satellites in each plane.
- Each satellite completes a full trip around the earth every 109 minutes.
- The earth is rotating underneath satellites, so they will always be flying over new locations on the ground.

How our connectivity works



CORONAL HOLES

- The sun surely seems to be smiling down on us. NASA released an image taken by its Solar Dynamics Observatory (SDO) where the Sun seems to have two dark eyes, a bright round nose and a wide-open smile.
- NASA's Solar Dynamics Observatory caught the Sun "smiling." Seen in ultraviolet light, these dark patches on the Sun are known as coronal holes and are regions where fast solar wind gushes out into space.



About

- The dark areas that seemingly form a 'face' on the Sun are coronal holes, which are cooler denser regions in the Sun's corona.
- They appear dark in images taken in ultraviolet light and in this instance, they coincidentally happen to form what looks like a smiling face.
- In the interior, it studies the solar dynamo, which is the churning of the star's interior that creates a magnetic field and drives space weather.
- It observes the solar surface to measure this magnetic field and the solar atmosphere to help scientists understand how magnetic energy is linked to the interior and how it causes space weather events.
- Importantly, it also measures the extreme ultraviolet irradiance of the Sun, an important factor that contributes to the structure and composition of our planet's upper atmosphere.

- The magnetic field is open to interplanetary space, sending solar material out in a high-speed stream of solar wind.
- Coronal holes can last between a few weeks to months.
- They can last much longer during solar minimum – a period of time when activity on the Sun is substantially diminished
- These coronal holes are important to understand the space environment around the earth.
- While it is unclear what causes coronal holes, they correlate to areas on the sun where magnetic fields soar up and away, without looping back down to the surface as they do elsewhere.

Geomagnetic Storm

- Geomagnetic storms relate to earth's magnetosphere – the space around a planet that is influenced by its magnetic field.
- When a high-speed solar stream arrives at the earth, in certain circumstances it can allow energetic solar wind particles to hit the atmosphere over the poles.
- Such geomagnetic storms cause a major disturbance of the magnetosphere as there is a very efficient exchange of energy from the solar wind into the space environment surrounding earth.
- In cases of a strong solar wind reaching the earth, the resulting geomagnetic storm can cause changes in the ionosphere, part of the earth's upper atmosphere.
- Radio and GPS signals travel through this layer of the atmosphere, and so communications can get disrupted.

NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS)

- Indian Veterinary Research Institute (IVRI) has demanded a ban on using aceclofenac in cattle after a new study showed that the drug metabolises into diclofenac in water buffaloes — as it does in cows.
- IVRI and its collaborators conducted the study and found that aceclofenac was rapidly converted to diclofenac while injecting the same water buffaloes.
- Such metabolisms pose a threat to vulture populations in the country.
- The drug caused accidental poisoning in raptors after they fed on carcasses of cattle injected with it.
- Aceclofenac in water buffaloes poses the same threat to vultures as it is a pro-drug of diclofenac.
- Aceclofenac is an unnecessary threat to the scavenging birds since safe alternatives — meloxicam and tolfenamic acid.

Initiatives by India

- The three drugs—aceclofenac, ketoprofen and nimesulide—were introduced as alternatives to diclofenac, that India banned in 2006 for animal use because it caused widespread vulture deaths.
- India is also a signatory to the Convention on Migratory Species' Multi-species Action Plan to Conserve African-Eurasian Vultures, which recognises NSAIDS as a major threat to vultures in India.
- The vulture action plan recommends meloxicam over diclofenac. Tolfenamic acid is the other safe option.

Diclofenac

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

CHINA SPACE STATION

- China's third and final module called Mengtian docked with its permanent space station to further a more than decade-long effort to maintain a constant crewed presence in orbit, as its competition with the U.S. grows increasingly fierce.

- Mengtian was blasted into space from the Wenchang Satellite Launch Center on the southern island province of Hainan
- 3 astronauts arrived for a six-month stay on board, during which they will complete the station's assembly, conduct space walks and carry out additional experiments.

Mengtian

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

Tiangong Space Station

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

CORONARY ARTERY DISEASE

- A study conducted by Sir Ganga Ram Hospital has said that Indians have an increased risk of Coronary Artery Disease (CAD) because of their smaller body surface area and not just a smaller diameter of arteries.
- In contrary to the general perception that Indians suffer more from CAD due to the smaller diameter of arteries.
- It was based on observational impact on 250 patients.
- 51 per cent respondents were hypertensive, 18 per cent were diabetic, four per cent were smokers, 28 per cent were dyslipidemic and 26 per cent had a family history of heart disease.

Key Findings

- The study found that the mean vessel diameter for males was significantly larger than those for females but when indexed to the Body Surface Area, these values were not significant.
- There has been an assumption that Asians, and particularly Indians, have increased risk of atherosclerosis (fatty deposits in arteries) because of their small coronary artery diameter.

- However, from our observational study, it is proved that the coronary artery dimensions in the Indian population are not small, the risk is due to their small Body Surface Area.
- Thus, the rationale for small dimensions of arteries being a risk factor for CAD is not valid in the Indian population.
- The study might also provide some insight into the use of diameters indexed to BSA as a cutoff for deciding the need for re-vascularisation (a procedure that can restore blood flow in blocked arteries or veins).
- This study was done to estimate the size of normal coronary arteries in the Indian population, index it to BSA, and see if there is any significant difference when compared to the Caucasian population.

BALLISTIC MISSILE DEFENCE INTERCEPTOR

- India conducted the first successful flight test of the Ballistic Missile Defence (BMD) interceptor missile capable of neutralising long-range missiles and aircraft.
- The Defence Research and Development Organisation (DRDO) conducted a successful maiden flight-test of phase-II Ballistic Missile Defence (BMD) interceptor AD-1 missile with a large kill altitude bracket from the APJ Abdul Kalam Island off the coast of Odisha.

AD-1 Missile

- The AD-1 (Air Defence) is a long-range interceptor missile designed for both low exo-atmospheric and endo-atmospheric interception of long-range ballistic missiles as well as aircraft.
- The missile is propelled by a two-stage solid motor and equipped with an indigenously developed advanced control system and a navigation and guidance algorithm to precisely guide the vehicle to the targets that move at very high speeds.
- It is a unique type of interceptor with advanced technologies available with a very few nations in the world and it will further strengthen the country's BMD capability to the next level.

LYCOPENE

- A team of researchers from the Institute of Nano Science and Technology (INST), Mohali, has developed a nano-biosensor for detecting 'lycopene', a phytochemical with high commercial value.
- The sensor uses a portable smartphone-based upconverting reusable fluorescent paper strip.
- This transparent Upconversion Nanoparticles (UCNP) strip has been found to be sensitive to lycopene with a detection limit as low as 10 nM.
- A simple smartphone camera can be used for detection.
- **Upconversion** is a process where light can be emitted with photon energies higher than the light generating the excitation.

Lycopene

- Lycopene is a carotenoid found in tomatoes, grapefruit, watermelons and papaya.
- It is also synthesised by plants and microorganisms but cannot be synthesised by the human body and can only be obtained via diet.
- It is a potent antioxidant that helps prevent cancer and heart diseases.
- Several epidemiologic studies have suggested a strong association between a high intake of lycopene-rich foods and a reduced risk of several cancers, notably prostate cancer.
- However, there are not many well-designed clinical trials conducted and the data remain inconclusive.
- As lycopene has potent antioxidant effects, it may interfere with chemotherapy and radiation therapy.
- Cancer patients are therefore suggested to use lycopene supplements with caution.

Natural Sources of Lycopene

- Tomato and tomato-based products are the major dietary sources of lycopene and account for approximately 80% of the consumption of lycopene in western countries.
- It is also present in a high amount in watermelon, guava, pink grapefruit, rosehips, papaya, and apricot.

XENOTRANSPLANTATION

- The genetically modified pig heart took longer to generate a heartbeat than hearts of pigs or humans usually do, researchers have said. The 57-year-old recipient lived for 61 days after the transplant in January.

Xenotransplantation

- Xenotransplantation is the process of transplanting organs from one species to another.
- It is a procedure that involves the transplantation, implantation or infusion into a human recipient of either (a) live cells, tissues, or organs from a nonhuman animal source, or (b) human body fluids, cells, tissues or organs that have had ex vivo contact with live nonhuman animal cells, tissues or organs.
- In 2021, surgeons at New York University Langone Health transplanted kidneys from the same line of genetically modified pigs into two legally dead people with no discernible brain function.
- The organs were not rejected, and functioned normally while the deceased recipients were sustained on ventilators.

Benefits

- Recent evidence has suggested that transplantation of cells and tissues may be therapeutic for certain diseases such as neurodegenerative disorders and diabetes, where, again, human materials are not usually available.

Issues

- The use of xenotransplantation raises concerns regarding the potential infection of recipients with both recognized and unrecognised infectious agents and the possible subsequent transmission to their close contacts and into the general human population.
- Moreover, new infectious agents may not be readily identifiable with current techniques.

ATELOPUS OR HARLEQUIN FROG

- Ecologists at Michigan State University (MSU) and collaborators in Ecuador have found 32 species of an amphibian genus — Atelopus or harlequin frogs — still surviving in the wild.
- Since the 1980s, a fungus called Bd — short for *Batrachochytrium dendrobatidis* — has been killing off members of more than 500 species of amphibians.
- Humans are responsible for the spread the fungus around the world.
- The harlequin frog genus was hit exceptionally hard by the fungus.
- Over the past four decades 80 per cent of its species were driven to extinction.

Atelopus

- Atelopus is a large genus of Bufonidae, commonly known as harlequin frogs or toads, from Central and South America, ranging as far north as Costa Rica and as far south as Bolivia.
- Atelopus species are small, generally brightly coloured, and diurnal.
- Most species are associated with mid-to-high elevation streams.
- This genus has been greatly affected by amphibian declines, and many species are now considered endangered, while others already are extinct.
- While threatened by habitat loss, pollution, and introduced species, the primary cause of these declines appears to be the chytrid fungus *Batrachochytrium dendrobatidis*.

GLYPHOSATE

- The Union Agriculture Ministry has restricted the use of glyphosate, a widely used herbicide. This comes even as the Supreme Court on November 10 is about to take up a plea seeking a ban on all herbicide-tolerant crops, including transgenic hybrid mustard and cotton.

What is glyphosate?

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

Use in India

- There are nine glyphosate-based formulations containing different concentrations of the chemical registered for use under the Insecticides Act, 1968.
- These are approved largely for weed control in tea gardens and non-crop areas such as railway tracks or playgrounds.
- Farmers also apply glyphosate on irrigation channels and bunds to clear these of weeds, making it easier for water to flow and to walk through them.
- Weeds growing on bunds are, moreover, hosts for fungi, such as those causing sheath blight disease in rice.
- In general, though, the scope for glyphosate use is limited for the very reason that it is non-selective.
- Designed to kill all plants coming into contact with it, the chemical cannot ordinarily distinguish between crop and weed.
- Hence, it can be used in tea or rubber plantations, but not in fields where the crops and weeds are at almost the same level.

Concerns

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

What exactly has the government now done?

- The Ministry of Agriculture and Farmers Welfare, on October 21, issued a notification stating that “the use of glyphosate involves health hazards and risk to human beings and animals”.
- It has, however, not banned and only “restricted” its use.
- The spraying of glyphosate and its derivatives shall henceforth only be permitted through “pest control operators”.

Why has this been done?

- The scope for glyphosate is already restricted in normal agricultural crops by virtue of it being a non-selective herbicide.
- Glyphosate application has increased only with the advent of genetic modification (GM) or transgenic technology.
- In this case, it has involved incorporating a 'cp4-epsps' gene, isolated from a soil bacterium *Agrobacterium tumefaciens*, into crop plants such as cotton, maize and soyabean.
- This alien gene codes for a protein that does not allow glyphosate to bind with the EPSPS enzyme.
- The said GM crop can, therefore, “tolerate” the spraying of the herbicide, which then kills only the weeds.
- In 2019 alone, some 81.5 million hectares were planted worldwide with herbicide-tolerant (HT) GM crops.
- The global glyphosate market is annually worth \$9.3 billion, with over 45 per cent of use on account of GM crops.
- As far as India goes, the only GM crop officially under commercial cultivation today is Bt cotton.
- This has two alien genes ('cry1Ac' and 'cry2Ab') from the soil bacterium *Bacillus thuringiensis*, that code for proteins toxic to the American bollworm, spotted bollworm and tobacco caterpillar insect pests.

- These seeds harbour both insect-resistance and HT traits, coming from the two Bt genes and the glyphosate-tolerant 'cp4-epsps' gene.

How valid are the health concerns over glyphosate?

- The World Health Organisation's International Agency for Research on Cancer (IARC), in March 2015, classified glyphosate as "probably carcinogenic to humans".
- But this was based on evidence for cancer in experimental animals from "pure" glyphosate, as opposed to that in humans from real-world exposures through diluted formulations (which is how the chemical is actually sold and used).
- The US Environmental Protection Agency, on the other hand, has held that there are "no risks of concern to human health from current uses of glyphosate" and "no evidence" of it causing cancer.
- The European Chemicals Agency, too, has concluded that "classifying glyphosate as a carcinogenic, mutagenic (causing DNA changes) or reprotoxic substance is not justified".
- The Union Environment Ministry's Genetic Engineering Appraisal Committee (GEAC), on October 18, recommended the commercial release of Delhi University's GM hybrid mustard.
- This crop can also tolerate the spraying of glufosinate ammonium, a non-selective herbicide similar to glyphosate.
- GEAC is further set to take a call on approving glyphosate-tolerant Bt cotton, whose illegal cultivation is an open secret.

INDIA'S FIRST PRIVATE ROCKET - VIKRAM-S

- India's first privately developed rocket — Vikram-S — is set for a launch between November 12 and 16, Hyderabad-based space startup Skyroot Aerospace announced.
- The maiden mission of Skyroot Aerospace, named 'Prarambh' (the beginning), will carry three customer payloads and is set for launch from Indian Space Research Organisation's launchpad at Sriharikota.
- The launch mission will be a suborbital spaceflight.
- Among the three payloads is a 2.5kg satellite of another space startup, Space Kidz India, which has been built by students from India, the US and Indonesia.
- Skyroot, a two-time national award winner, is the first start-up to sign a Memorandum of Understanding (MoU) with ISRO in this regard.

Vikram-S rocket

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

Suborbital spaceflight

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

New era for Indian space sector

- With this mission, Skyroot Aerospace is set to become the first private space company in India to launch a rocket into space, heralding a new era for the space sector which was opened up in 2020 to facilitate private sector participation.

ASIAN CONFERENCE ON DIARRHOEAL DISEASE AND NUTRITION (ASCODD)

- Union Minister of State for Health & Family Welfare, addressed the 16th Asian Conference on Diarrhoeal Disease and Nutrition (ASCODD) at Kolkata today.
- The theme of the ASCODD was “Prevention and control of cholera, typhoid and other enteric diseases in low and middle-income countries through community participation: beyond the SARS-CoV-2 pandemic”.
- Initiatives under Digital India initiative such as Online Registration System, eHospital for hospital management, eSanjeevani telemedicine app so that people could get treatment from the comfort of their homes.
- The conference program focuses on the latest issues in
- Enteric infections,
- Nutrition,
- Policy, and Practice including roadmap to end Cholera by 2030,
- Cholera vaccine development and rapid diagnostics,
- Contemporary perspectives of antimicrobial resistance of enteric bacteria:
- New Initiatives and challenges, enteric bacterial infections, including Shigella spp, epidemiology, burden, and vaccines against other viral infections, including Hepatitis, lessons learned about diarrhoea research during the COVID pandemic.

Diarrhoea

- Diarrhoea is a condition where an individual experiences a high frequency of loose and watery stools.
- Usually, it is not a life-threatening disease and the duration of its symptoms usually varies as there are many causal factors.

Caused by

- A Variety of bacterial, viral and parasitic organisms.
- Infection is spread through contaminated food or drinking-water, or from person to person as a result of poor hygiene.
- Associated with other symptoms: nausea, vomiting, abdominal pain or weight loss.
- Measures to treat diarrhoea:
- Rehydration with oral rehydration salts (ORS) solution
- Rehydration may require intravenous fluids in case of severe dehydration or shock.
- Zinc supplements
- Nutrient-rich foods.

Achievements of India

- India successfully ran a free vaccination program with record break vaccination of more than 219 crores.
- India provided vaccinations to other nations so that it can win over the pandemic together. Effective use of safe and affordable vaccines,
- Various Health initiatives under Digital India initiative:
- Online Registration System,
- eHospital for hospital management,
- eSanjeevani telemedicine app

CHALLENGER SPACESHIP

- NASA’s Kennedy Space Center has announced the recovery of debris from the Challenger spaceship that exploded 73 seconds after liftoff killing all seven astronauts aboard 37 years ago.

The Challenger space shuttle disaster

- The spacecraft broke apart on January 28, 1986 after it suffered a major malfunction less than 2 minutes into its flight with investigations revealing freezing temperatures having affected the integrity of O-ring seals in the solid rocket booster segment joints.
- The O-ring seals are used to keep fluids from leaking and components sealed.

- The last Challenger mission, dubbed STS-51L, was commanded by Francis R “Dick” Scobee and piloted by Michael J Smith.

About the mission

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

EXERCISE MALABAR

- The 26th edition of the quadrilateral maritime drill, Exercise Malabar among the navies of the Quad countries India, the United States, Japan and Australia culminated in the seas off the coast of Japan.
- The exercise aimed at cooperation in the strategically significant Indo-Pacific region was hosted by the Japan Maritime Self Defence Force (JMSDF) this time.

Malabar Exercise and how it has evolved

- It is a multilateral war-gaming naval exercise that started in 1992 as a bilateral exercise between India and the USA.
- After successful editions in 1995 & 1996, there was a break until 2002 in the aftermath of India’s nuclear tests.
- It has been conducted every year after 2002
- Japan and Australia first participated in 2007, and since 2014, India, the US and Japan have participated in the exercise every year.
- Japan joined in 2015 as a permanent member, and Malabar became a trilateral exercise.
- In 2020, for the first time in over a decade, Australia joined the exercise and all QUAD navies were seen together in action.
- The 26th edition is quadrilateral maritime drill among the navies of the Quad countries — India, the United States, Japan and Australia.
- The exercise aimed at cooperation in the strategically significant Indo-Pacific region, through improved interoperability with the partner navies.

In the 26th edition

- The Indian Navy was represented by Eastern Fleet, led by its Flag Officer Commanding, Rear Admiral Sanjay Bhalla.
- The Indian contingent was represented by stealth multirole frigate INS Shivalik and anti-submarine corvette INS Kamorta.
- ‘War at Sea’ exercise
- Exchange of ‘Sea Riders’

AGNI-3 MISSILE

- India carried out a successful training launch of the nuclear capable Intermediate Range Ballistic Missile (IRBM) Agni-3 from APJ Abdul Kalam Island, Odisha as part of routine user training launches conducted by the Strategic Forces Command.

About the Agni-3 Missile

- The 16-meter long missile, weighing more than 48 tonnes, has a range of over 3000 kilometers and is capable of carrying a payload of over 1.5 tonnes.
- Flight trajectory was tracked by a number of radars, telemetry observation stations, electro-optic instruments and naval ships deployed at the sea.

- The two-stage solid propellant powered IRBM is under operational purview of the Strategic Forces Command, which is part of India's Nuclear Command Authority and has been developed by the Defence Research and Development Organisation (DRDO).
- The first known developmental trial of Agni-3 was conducted in July 2006 but could not yield the expected result.
- It was subsequently successfully flight tested in April 2007.
- The system has been successfully tested several times since then.
- The Agni-3 test comes over a month after India's Strategic Strike Nuclear Submarine, INS Arihant, carried out a successful launch of a Submarine Launched Ballistic Missile (SLBM).
- The launch is significant to prove crew competency and validate the SSBN programme, a key element of India's nuclear deterrence capability. A robust, survivable and assured retaliatory capability is in keeping with India's policy to have 'Credible Minimum Deterrence' that underpins its 'No First Use' commitment."

Question: Discuss the evolution of Integrated Guided Missile Development Programme of India. (150 Words)

INDIA'S FIRST-EVER NIGHT SKY SANCTUARY IN LADAKH

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

About the Sanctuary:

- It is being set up by Council of Scientific and Industrial Research under Union Ministry of Science & Technology.
- The proposed Dark Sky Reserve will be located at Hanle in Ladakh as a part of Changthang Wildlife Sanctuary.
- The Changthang Wildlife Sanctuary is a high altitude wildlife sanctuary located in the Ladakh adjunct of the Changthang plateau.
- Hanle is located in Ladakh's cold desert region, away from any form of human disturbance with clear sky conditions and dry weather conditions that exist throughout the year.
- In a first-of-its-kind initiative, the Department of Science & Technology (DST).
- Hanle, which is about 4,500 metres above sea level, hosts telescopes and is regarded as one of the world's most optimal sites for astronomical observations.
- However, ensuring that the site remains well-suited for astronomy implies keeping the night sky pristine, or ensuring minimal interference to the telescopes from artificial light sources such as electric lights and vehicular lights from the ground.
- A dark sky reserve is a designation given to a place that has policies in place to ensure that a tract of land or region has minimal artificial light interference.

Significance

- Promotion astro-tourism, villages around Hanle would be encouraged to promote homestays equipped with telescopes that visitors can use to view the night sky.
- Villagers would also be trained to help visitors with astronomical observations.

Ideal Conditions

- The Indian Astronomical Observatory, the high-altitude station of the IIA, is situated to the north of Western Himalayas, at an altitude of 4,500 metres above mean sea level.
- Located atop Mt. Saraswati in the Nilamkhul Plain in the Hanle Valley of Changthang, it is a dry, cold desert with sparse human population.
- The cloudless skies and low atmospheric water vapour make it one of the best sites in the world for optical, infrared, sub-millimetre, and millimetre wavelengths.

PSLV-C54

- In one of its longest missions, the Indian Space Research Organisation (ISRO) successfully placed nine satellites, including an Earth Observation Satellite (EOS-06) in multiple orbits with the help of the space agency's Polar Satellite Launch Vehicle (PSLV-C54).
- The eight nano satellites include ISRO Nano Satellite-2 for Bhutan (INS-2B), Anand, Astrocast (four satellites), and two Thybolt satellites. Notably, EOS-6 is the Oceansat series' third-generation satellite.
- This is the 56th flight of the Polar Satellite Launch Vehicle (PSLV) and the 24th flight of the PSLV-XL version with 6 PSOM-XIs.

About the Satellites

- **EOS-06** is envisaged to observe ocean colour data, sea surface temperature and wind vector data to use in oceanography, climatic and meteorological applications.
- The satellite also supports value added products such as potential fishing zone using chlorophyll, SST and wind speed, and land based geophysical parameters.
- It is the Oceansat series' third-generation satellite, which provides continued services of Oceansat-2 with enhanced payload capability.
- The satellite onboard carries four payloads.
- **Astrocast**, a 3U spacecraft with 4 Satellites from Spaceflight Inc, U.S., were separated.
- **The Thybolt**, a 0.5U spacecraft bus that includes a communication payload to enable rapid technology demonstration and constellation development for multiple users from Dhruva Space using their own Orbital Deployer with a minimum lifetime of one year, was deployed in the intended orbit.
- **The Anand** three axis stabilised nano satellite, a technology demonstrator for miniaturised electro-optical payload and all other sub-systems like TTC, power, onboard computer and ADCS from Pixxel, India was also placed in the orbit.
- **The INS-2B satellite** has two payloads namely NanoMx, a multispectral optical imaging payload developed by Space Applications Centre (SAC) and APRS-Digipeater, which is jointly developed by DITT-Bhutan and URSC.

Future launches

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

About Polar Satellite Launch Vehicle(PSLV):

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

Question: India's space programme is playing pivotal role to strengthen India's ties with other countries. Discuss.

BLUEBUGGING

- Several smartphones have their Bluetooth settings on discovery mode as it is a default setting, making it easy for hackers to access the phones when they are within 10 metres from the device. This is done through a process called Bluebugging.

What is Bluebugging?

- Bluebugging is a form of hacking that lets attackers access a device through its discoverable Bluetooth connection.
- Once a device or phone is bluebugged, a hacker can listen to the calls, read and send messages and steal and modify contacts.
- It started out as a threat to laptops with Bluetooth capability.
- Later hackers used the technique to target mobile phones and other devices.

How does Bluebugging work?

- Bluebugging attacks by exploiting Bluetooth-enabled devices. The device's Bluetooth must be in discoverable mode, which is the default setting on most devices.
- The bluetooth enabled device must also be within a 10-metre radius of the hacker.
- The hacker then tries to pair with the device via Bluetooth. Once a connection is established, hackers can use brute force attacks to bypass authentication.
- They can install the malware in the compromised device to gain unauthorized access to it.

Which devices are susceptible to Bluebugging?

- Any Bluetooth-enabled device can be bluebugged.
- Wireless earbuds are also susceptible to such hacks.
- Apps that enable users to connect to their TWS (True Wireless Stereo) devices or earbuds can record conversations.

What are the techniques to prevent bluebugging?

- Turning off Bluetooth and disconnecting paired Bluetooth devices when not in use.
- Updating the device's system software to the latest version
- Limited use of public Wi-Fi.
- Using VPN as an additional security measure.

SARAS RADIO TELESCOPE

- India's SARAS radio telescope provides astronomers clues to the nature of Universe's first stars and galaxies.
- In a first-of-its-kind work, using data from SARAS 3, researchers from the Raman Research Institute (RRI), Bengaluru, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia, along with collaborators at the University of Cambridge and the University of Tel-Aviv, estimated the energy output, luminosity, and masses of the first generation of galaxies that are bright in radio wavelengths.
- Scientists have determined properties of radio luminous galaxies formed just 200 million years post the Big Bang, a period known as the Cosmic Dawn thus providing an insight to the properties of the earliest radio loud galaxies that are usually powered by supermassive black holes.

About SARAS

- Shaped Antenna measurement of the background Radio Spectrum 3 (SARAS) telescope.
- It is indigenously designed and built at Raman Research Institute -- was deployed over Dandiganahalli Lake and Sharavati backwaters, located in Northern Karnataka, in early 2020.
- The results from the SARAS 3 telescope are the first time that radio observations of the averaged 21-centimeter line have been able to provide an insight to the properties of the earliest radio loud galaxies that are usually powered by supermassive black holes.
- SARAS 3 has improved our understanding of astrophysics of Cosmic Dawn, telling us that less than 3 percent of the gaseous matter within early galaxies was converted into stars, and that the earliest galaxies that were bright in radio emission were also strong in X-rays, which heated the cosmic gas in and around the early galaxies.
- It is used to reject claims of the detection of an anomalous 21-cm signal from Cosmic Dawn made by the EDGES radio telescope developed by researchers from Arizona State University (ASU) and MIT, USA.
- This refusal helped restore confidence in the concordant model of cosmology that was brought into question by the claimed detection.

- The analysis has shown that the 21-cm hydrogen signal can inform about the population of first stars and galaxies.

About the study

- Scientists study the properties of very early galaxies by observing radiation from hydrogen atoms in and around the galaxies, emitted at a frequency of approximately 1420 MHz.
- The radiation is stretched by the expansion of the universe, as it travels to us across space and time, and arrives at Earth in lower frequency radio bands 50-200 MHz, also used by FM and TV transmissions.
- The cosmic signal is extremely faint, buried in orders of magnitude brighter radiation from our own Galaxy and man-made terrestrial interference.
- Therefore, detecting the signal, even using the most powerful existing radio telescopes, has remained a challenge for astronomers.
- Usage: Even non-detection of this line from the early Universe can allow astronomers to study the properties of the very first galaxies by reaching exceptional sensitivity.

Question: What are the key characteristics of India's SARAS radio telescope?

SEMI-AUTOMATED OFFSIDE TECHNOLOGY

- In the opening match of the FIFA World Cup 2022 between host Qatar and Ecuador, just three minutes' of action had passed before the first goal of the tournament was ruled out for offside.
- One three-dimensional animation of the incident was displayed for a fleeting second or two before play restarted.
- FIFA's brand new Semi-Automated Offside Technology (SAOT) was responsible for the quick decision.

What is SAOT?

- There are two parts to the technology — a sensor inside the match ball (Adidas's Al Rihla) that is held using suspension technology, and existing tracking tools that are part of the VAR system as we know.
- Kinexon, a German company that specialises in providing sensor networks and computing solutions, has designed a small in-ball device which gives precise positional data and also detects ball movement in a three-dimensional space.
- Every time the ball is hit, data is sent in real time (at a whopping 500 frames per second) to a network of antennae installed around the playing field.
- Additionally, there are 12 Hawk-Eye cameras set up around the turf that shadow both the ball and the players, with as many as 29 separate points in the human body tracked.
- The coming together of the ball sensor and the Hawk-Eye cameras is in effect SAOT, which FIFA says allows for decisions that are highly accurate and quick.
- These two data sets are run through artificial intelligence software which generates automated alerts about offsidess to the match officials.
- This replaces the manual effort taken in poring over replays for minutes on end.

How accurate is the SAOT data?

- The data transmission rate from the ball (500 frames per second or 500Hz) makes the process pretty accurate.
- The time between two frames is two milliseconds (1/500), which is 10 times better than a standard 50Hz video that is commonly used in High Definition monitors.
- Further, to synchronise the data from the ball sensor and Hawk-Eye, a Precision Time Protocol clock is used.
- FIFA tested the whole technology at both the 2021 FIFA Arab Cup in Qatar and the 2021 FIFA Club World Cup in Abu Dhabi.

Question: Discuss the main feature of Semi-Automated Offside Technology (SAOT)?

MEASLES

- Mumbai has reported 11 fresh measles cases and one suspected death amid the outbreak of the viral infection in the city according to the Brihanmumbai Municipal Corporation.

Measles

- Measles is a childhood infection caused by a virus. Once quite common, measles can now almost always be prevented with a vaccine.
- Also called rubella, measles spreads easily and can be serious and even fatal for small children.
- Measles is a highly contagious, serious disease caused by a virus.
- Measles is caused by a virus in the paramyxovirus family and it is normally passed through direct contact and through the air. The virus infects the respiratory tract, then spreads throughout the body. Measles is a human disease and is not known to occur in animals.

Signs and symptoms

- The first sign of measles is usually a high fever, which begins about 10 to 12 days after exposure to the virus, and lasts 4 to 7 days.
- A runny nose, a cough, red and watery eyes, and small white spots inside the cheeks can develop in the initial stage.
- After several days, a rash erupts, usually on the face and upper neck.
- Over about 3 days, the rash spreads, eventually reaching the hands and feet.
- Most measles-related deaths are caused by complications associated with the disease.
- Serious complications are more common in children under the age of 5, or adults over the age of 30.
- The most serious complications include blindness, encephalitis (an infection that causes brain swelling), severe diarrhoea and related dehydration, ear infections, or severe respiratory infections such as pneumonia.
- Severe measles is more likely among poorly nourished young children, especially those with insufficient vitamin A, or whose immune systems have been weakened by HIV/AIDS or other diseases.

Transmission

- Measles is one of the world's most contagious diseases. It is spread by coughing and sneezing, close personal contact or direct contact with infected nasal or throat secretions.
- The virus remains active and contagious in the air or on infected surfaces for up to 2 hours.
- It can be transmitted by an infected person from 4 days prior to the onset of the rash to 4 days after the rash erupts.
- Measles outbreaks can result in epidemics that cause many deaths, especially among young, malnourished children.
- In countries where measles has been largely eliminated, cases imported from other countries remain an important source of infection.

Treatment

- No specific antiviral treatment exists for measles virus.
- Severe complications from measles can be reduced through supportive care that ensures good nutrition, adequate fluid intake and treatment of dehydration with WHO-recommended oral rehydration solution.
- This solution replaces fluids and other essential elements that are lost through diarrhoea or vomiting.
- Antibiotics should be prescribed to treat eye and ear infections, and pneumonia.
- All children diagnosed with measles should receive two doses of vitamin A supplements, given 24 hours apart.
- This treatment restores low vitamin A levels during measles that occur even in well-nourished children and can help prevent eye damage and blindness.
- Vitamin A supplements have also been shown to reduce the number of measles deaths.
- WHO recommends immunization for all susceptible children and adults for whom measles vaccination is not contraindicated.

- Reaching all children with 2 doses of measles vaccine, either alone, or in a measles-rubella (MR), measles-mumps-rubella (MMR), or measles-mumps-rubella-varicella (MMRV) combination, should be the standard for all national immunization programmes.

Question: What are the symptoms of measles? List the steps for the prevention and treatment of this disease.

RED PLANET DAY

- Commemorating the day one of the most significant space missions to Mars was launched, November 28 is marked as Red Planet Day. On this day in 1964, the United States launched the space probe Mariner 4 on a course towards Mars, which it flew past in July 1965, sending back pictures of the red planet.
- This was the first time that a spacecraft undertook the first flyby of the red planet, becoming the first-ever spacecraft to take close-up photographs of another planet.

About the Mars

- In the late 19th century, Italian astronomer Giovanni Schiaparelli claimed to have observed linear patterns on the surface of the planet that he called canali.
- This was mistranslated into English as canals, leading some to believe canals were built by intelligent beings on Mars an early instance of Mars being thought to have life, similar to Earth.

1964: Mariner 4

- After an eight-month voyage to Mars, the Mariner 4 helped humans see images showing lunar-type impact craters, some of them touched with frost.
- A television camera onboard took 22 pictures, covering about 1% of the planet. These photos were transmitted to Earth in four days.

Viking missions of the 1970s and the 1980s

- The Viking missions in the mid-seventies carried out the first chemical analysis of Martian soil, as well as four biology experiments to detect biological activity.
- In the early 1980s, scientists hypothesised, based on mineralogic composition and rock texture, that certain meteorites might have a source region in Mars.
- In 1984, a study showed that the isotopic composition of rare gases (Xenon, Krypton, Neon and Argon) matched the isotopic ratios of the Martian atmosphere measured by the Viking spacecraft.
- This discovery provided a way for geochemists to study Martian samples – and provided a huge boost to our understanding of the geochemical evolution of Mars.

Odyssey, 2001 and water on Mars

- In 2001, the Gamma Ray Spectrometer on board the Mars Odyssey spacecraft detected a fascinating hydrogen signature that seemed to indicate the presence of water ice.
- But there was ambiguity – this was because hydrogen can be part of many other compounds as well.
- NASA's Phoenix landed on the Martian North Pole in May 2008, and survived for about 150 days.
- The robotic arms of Phoenix scooped soil and ice from the surface, heated the material in eight ovens, and measured the composition of the gases with a mass spectrometer.
- The Phoenix mission established conclusively that the initial discovery of hydrogen by Mars Odyssey in 2002 was indeed water ice.

Mars Missions

- NASA has a lander (Mars Insight), a rover (Curiosity), and three orbiters (Mars Reconnaissance Orbiter, Mars Odyssey, MAVEN).
- India has an orbiter (Mangalyaan-1).
- The EU has 2 orbiters (Mars Express and ExoMars Trace Gas Orbiter)
- China and UAE will have an orbiter each (Hope and Tianwen-1 respectively).

- The UAE mission will study the Martian atmosphere, and will seek to address the billion-dollar question of how and why Mars lost its atmosphere.
- **India's Mars Orbiter Mission** : A technology demonstration venture carried five scientific payloads (total 15 kg) collecting data on surface geology, morphology, atmospheric processes, surface temperature and atmospheric escape process.

Question: Discuss the evolution of Mars missions with special reference of Mars Orbiter Mission.



CivilsTap Himachal

ENVIRONMENT

EMISSIONS GAP REPORT 2022

- The report was released by the United Nations Environment Programme (UNEP).

Key Findings

- Current pledges by countries for reducing greenhouse gas emissions would still leave the world warmer by 2.4-2.6 degrees celsius by the end of the century.
- This will increase the frequency and intensity of extreme weather events.
- It would also mean that many of the climate-tipping elements, essential atmospheric, oceanic and ecosystems responsible for maintaining life on Earth would cross their tipping points and push the planet into a never-before-seen environment.
- The report found that the updated pledges by countries, also known as nationally determined contributions (NDC) under the Paris Agreement, only reduce the projected greenhouse emissions by 1 per cent by 2030.
- The world is falling short of the goals set forth in the Paris Climate Agreement adopted in 2015.
- No credible pathway is currently in place to restrict global warming to under 1.5 degrees Celsius above pre-industrial levels.
- The top seven emitters (China, the EU27, India, Indonesia, Brazil, the Russian Federation and the United States of America) plus international transport accounted for 55 percent of global GHG (greenhouse gas) emissions in 2020.
- In India and six other top emitters, emissions have rebounded in 2021, exceeding pre-pandemic 2019 levels.
- Collectively, G20 members are responsible for 75 percent of global GHG emissions.
- The global average per capita GHG emissions was 6.3 tonnes of CO₂ equivalent (tCO₂e) in 2020.
- The report finds that the world must cut emissions by 45 percent to avoid global catastrophe.

About the report

- This is the 13th edition of the Report.
- Title: 'The Closing Window — Climate Crisis Calls for Rapid Transformation of Societies'
- An overview of the difference between where greenhouse emissions are predicted to be in 2030 and where they should be to avert the worst impacts of climate change.

RAINWATER HARVESTING

- The NITI Aayog report (2018) says that India's water demand will exceed water supply by a factor of two by 2030. These call for urgent attention for ensuring water security in the coming years.
- According to World Water Development Report 2015 (UNESCO), India is a frontrunner in groundwater extraction.
- The water table is going down in several areas.
- The reasons for this decline are multi-fold;
- Overexploitation of shared water resources,
- Mismanagement, and
- Climate change impact.
- India covers around 2.45% of the world's surface area and has 4% of the world's water resources.
- In India, rainfall is the primary source of freshwater.
- For a country of its size, India receives the second most amount of rainfall.
- Several metropolitan cities are already facing difficulties meeting water demand due to high population density and limited water resources.
- For example, Delhi has a water supply of approximately 930 million gallons a day (mgd) while its demand is 1,380 mgd.

Rain Water Harvesting

- Rain water harvesting is collection and storage of rain water that runs off from roof tops, parks, roads, open grounds, etc.
- This water runoff can be either stored or recharged into the ground water.

A rainwater harvesting systems consists of the following components:

- Catchment from where water is captured and stored or recharged,
- Conveyance system that carries the water harvested from the catchment to the storage/recharge zone,
- First flush that is used to flush out the first spell of rain,
- Filter used to remove pollutants,
- Storage tanks and/or various recharge structures.

Government Efforts to conserve the rainwater

- For improving access to water, the government has given special focus to implementing “source sustainability measures such as
- Recharge and reuse through grey water management
- Water conservation
- Rainwater harvesting
- A campaign to “Catch the rain, where it falls, when it falls”, which aims to push stakeholders to create appropriate rainwater harvesting structures, has also been launched.
- Several government schemes, for example, Atal Bhujal Scheme, are currently focusing on aquifer mapping to construct artificial reservoirs and rainwater harvesting structures.
- These mapping techniques take into account hydrogeology and source water availability.
- These efforts are expected to reduce groundwater depletion. Rainwater harvesting (RWH) process will help in this regard.

Agenda Ahead

- Efforts that could help attain the target of reducing dependency on groundwater,
- Enhancing water security,
- Include rejuvenation and
- Recharge of natural and constructed water bodies,
- Increased reuse of treated wastewater through local sewage treatment plants and well-designed rainwater harvesting systems across residential and commercial areas.
- There is a need for stringent policy initiatives for long-term and sustainable solutions.
- An integrated water management plan must be brought up by local bodies and implemented at the local level.

- Therefore, the need of the hour is to promote rainwater harvesting using a mix of traditional ecologically safe, viable and cost-effective systems with modern rainwater saving techniques, such as percolation tanks, injection wells and subsurface barriers to rejuvenate India’s depleted water resources. But using only traditional methods is not enough. Productively combining these structures could be the answer to India’s perennial water woes.

Traditional water conservation systems around India

- **Phad** – It is a community-managed irrigation system in the tapi river basin in Maharashtra. It starts with check dam built across a river and canals to carry water to agricultural blocks with outlets to ensure excess water is removed from the canals.
- **Zing** – It is found in Ladakh, are small tanks that collect melting glacier water. A network of guiding channels brings water from the glacier to the tank.
- **Kuhls** – They are surface water channels found in the mountainous regions of Himachal Pradesh. The channels carry glacial waters from rivers and streams into the fields.

- **Zabo or Ruza System**– It is practised in Nagaland. Rainwater that falls on forested hilltops is collected by channels that deposit the run-off water in pond-like structures created on the terraced hillsides.
- **Jackwells** - The Shompen tribe of the Great Nicobar Islands uses this system, in which bamboos are placed under trees to collect runoff water from leaves and carries it to jackwells which are pits encircled by bunds made from logs of hard wood.
- **Pat system** – It is developed in Madhya Pradesh, in which the water is diverted from hill streams into irrigation channels by diversion bunds. They are made across the stream by piling up stones and teak leaves and mud.
- **Eri** – It is tank system, widely used in Tamil Nadu which acts as flood-control systems, prevent soil erosion and wastage of runoff during periods of heavy rainfall, and also recharge the groundwater.
- **Johads** – They are small earthen check dams used to conserve and recharge ground water, mainly constructed in an area with naturally high elevation.
- **Panam keni** – The Kuruma tribe (a native tribe of Wayanad) uses wooden cylinders as a special type of well, which are made by soaking the stems of toddy palms and immersed in groundwater springs.
- **Ahar Pynes** – They are traditional floodwater harvesting systems indigenous to South Bihar. Ahars are reservoirs with embankments on three sides and Pynes are artificial rivulets led off from rivers to collect water in the ahars for irrigation in the dry months.
- **Jhalara** - Jhalaras are typically rectangular-shaped stepwells that have tiered steps on three or four sides in the city of Jodhpur.
- **Bawari** - Bawaris are unique stepwells that were once a part of the ancient networks of water storage in the cities of Rajasthan.
- **Taanka** - It is a cylindrical paved underground pit into which rainwater from rooftops, courtyards or artificially prepared catchments flows. It is indigenous to the Thar Desert region of Rajasthan.
- **Khadin** – Also called dhora, is a long earthen embankment that is built across the hill slopes of gravelly uplands. It is indigenous to Jaisalmer region and similar to the irrigation methods of Ur region (Present Iraq).
- **Kund** – It is a saucer-shaped catchment area that gently slopes towards the central circular underground well. It is found in the sandier tracts of western Rajasthan and Gujarat.

ARCTIC FIRES COULD RELEASE CATASTROPHIC AMOUNTS OF CO₂

- The recent fires themselves have spewed some 150 million tonnes of carbon into the atmosphere.

Finding

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

Polar Amplification

- Polar amplification happens when changes to the earth's atmosphere lead to a larger difference in temperature near the north and south poles than to the rest of the world.
- This phenomenon is measured against the average temperature change of the planet.
- These changes are more pronounced at the northern latitudes and are known as the Arctic amplification.

- It occurs when the atmosphere's net radiation balance is affected by an increase in greenhouse gases (GHGs)

Reasons for Polar Amplification

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

The consequences of Arctic Warming/ Polar Amplification

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

Source of Permafrost

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

COP 27: A FIELD GUIDE TO CLIMATE JARGON

- Representatives from the world's nations meet in Sharm el-Sheikh, Egypt, on Nov. 6-18 to flesh out the rules of a new global climate pact. Decades of climate talks have spawned a host of acronyms and jargon.

GLASGOW PACT

- Reached at the 2021 U.N. climate summit in Glasgow, Scotland, the Glasgow Pact marked the first time a U.N. climate agreement mentioned the goal of reducing fossil fuel use.
- The pact marked a breakthrough in efforts to resolve rules guiding the international trade of carbon markets to offset emissions.
- With time running out for steep emissions cuts, the pact also urges nations to come up with more ambitious climate plans

PARIS AGREEMENT

- Successor to the Kyoto Protocol, the international climate treaty that expired in 2020.

- Agreed in December 2015, the Paris Agreement aims to limit the rise in the average global surface temperature.
- To do this, countries that signed the accord set national pledges to reduce humanity's effect on the climate that are meant to become more ambitious over time.

GREENHOUSE GASES

- The carbon dioxide (CO₂) emitted by the burning of fossil fuels such as coal, diesel, gasoline or petrol, kerosene and natural gas is the main "greenhouse gas" responsible for warming the Earth's atmosphere.
- But there are others such as methane, which is produced by cows and waste dumps, that are much more potent than CO₂ but much shorter-lived in the atmosphere.

1.5 DEGREES

- The Paris accord legally bound its signatories collectively to limit greenhouse gas emissions to keep the temperature rise "well below" 2.0 degrees Celsius (3.6 Fahrenheit) this century.
- But the countries also promised to "pursue efforts" to keep the rise below 1.5C (2.7F), which scientists say would help to avert some of the most catastrophic effects.
- Soberingly, the world has already heated up by just over 1C since the start of the Industrial Revolution.
- Even if all the pledges made so far are delivered, it is still on track for an average rise of 2.7C this century.

COP27

- The Conference of the Parties (COP) is the supreme body of the United Nations Framework Convention on Climate Change (UNFCCC), made up of representatives from each country that signed the Paris Agreement and which meets every year.
- COP27, the 27th annual meeting, is being held under an Egyptian presidency in the Red Sea resort town of Sharm el-Sheikh.

NATIONALLY DETERMINED CONTRIBUTIONS

- NDCs are the pledges that each country makes to reduce its emissions and adapt to climate change from 2020 onward.
- Countries have to update and expand their NDCs every five years. All signatories have submitted new pledges for Glasgow.

'JUST TRANSITION'

- The term used to describe a shift to a low-carbon economy that keeps the social and economic disruption of moving away from fossil fuels to a minimum while maximising the benefits for workers, communities and consumers.

CLIMATE FINANCE

- Richer countries agreed in 2009 to contribute \$100 billion together each year by 2020 to help poorer countries adapt their economies and lessen the impact of rising seas, or more severe and frequent storms and droughts.
- In 2015 they agreed to extend this goal through to 2025, but the target has yet to be met.
- To put things in perspective, a U.S. Energy Department official estimated that the United States alone needs to invest \$1 trillion a year to meet its new climate targets.

CBDR

- The principle of "common but differentiated responsibilities" (CBDR), was enshrined in the Kyoto accord.
- It says that developed countries, which produced more emissions in the past as they built their economies, should take the lead in fighting climate change.
- The issue is always one of the most thorny in climate talks.
- The Paris Agreement sought to bind major rapidly developing economies such as China and Brazil into the global effort to cut emissions, adding the words "in light of different national circumstances".
- It does not, however, require them to make any immediate pledges to cut their emissions.

'LOSS AND DAMAGE'

- Although richer countries have agreed to provide them with funding to address the impact of climate change, poorer countries continue to press for an agreed basis to assess liability for the losses and damage caused by climate change, and calculate compensation.

NAGALAND TO UNDERTAKE FIRST BIRD COUNT

- Nagaland is undertaking the first avian documentation exercise to go beyond Amur falcons, the migratory raptor that put the State on the world birding map.
- The event is a collaboration among the Wokha Forest Division, the Divisional Management Unit of the Nagaland Forest Management Project (NFMP) and Bird Count India.
- Amur falcons put Nagaland on the world birding map.
- However, the communities here can do more than just Amur falcon conservation.
- The TEBC is the first of initiatives where the community is encouraged to celebrate the festival with birds.

Amur Falcon

- Amur falcons (*Falco amurensis*) are the world's longest travelling migratory raptors.
- They migrate annually during winter from their breeding grounds in Mongolia, South-east Russia and northern China to warmer South Africa through India and across the Arabian Sea.
- Doyang Lake in Nagaland is known as a stopover for the Amur falcons during their annual migration.
- IUCN Status: Least Concern
- It is also protected under the Indian Wildlife Protection Act, 1972 and the Convention on Migratory Species (CMS) to which India is a signatory.
- Nagaland Government organises Amur Falcon festival to spread awareness about the need to provide safe passage to Amur falcons.

Illegal Trade and Hunting

- An estimated one lakh Amur Falcons were trapped and killed by villagers for the commercial meat trade in different years.
- Both the trade and the appetite for the Amur falcon seem to be growing: while some birds were transported in trucks for sale in places far from the trapping spot, others were discarded, simply because too many had been caught.
- According to conservation India, each bird is sold for a price between Rs. 16-25 (always sold as number of birds for Rs. 100 (\$ 1.9 / £ 1.2).
- This sale usually happens door-to-door in Pangti village (where most hunters are from) as well as nearby Doyang and Wokha towns. Hunters (and sellers) know that Amur killing is illegal and banned by the Deputy Commissioner (Wokha district) since 2010.

MANGROVE BREAKTHROUGH

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

About

- The Breakthrough Agenda launched at COP26, and the work of the Global Mangrove Alliance.
- The Mangrove Breakthrough provides a framework for countries, the private sector, and others to join forces and strengthen their actions every year, in every sector, through a coalition of leading public, private and public-private global initiatives scaling up investment in mangrove protection and restoration.
- The Mangrove Breakthrough is part of a set of **Marrakech Partnership Adaptation and Resilience Breakthroughs** which collectively define global milestones and high-impact solutions to reduce climate risks, particularly in vulnerable communities, through adaptation action.
- It aims to catalyze the financial support needed to scale proven solutions by working to channel finance to the ground through the Global Mangrove Alliance:

- A world-wide collaboration between NGOs, governments, academics and communities working together towards a global vision for accelerating change and building a host of opportunities for coastal peoples and biodiversity around the planet.

About The Global Mangrove Alliance:

- In 2018 they formed by
- Conservation International (CI),
- The International Union for Conservation of Nature (IUCN),
- The Nature Conservancy (TNC),
- Wetlands International,
- World Wildlife Fund (WWF) formed the Global Mangrove Alliance (GMA).
- This partnership now includes over 30 member organizations that share the aim of scaling up the recovery of mangroves through equitable and effective expansion of both mangrove protection and the restoration of former mangrove areas.

Global Mangrove Watch (GMW):

- It is an online platform that provides the remote sensing data and real time information about changes and tools for monitoring mangroves across the world, and highlights why they are valuable.
- Established in 2011 under the Japan Aerospace Exploration Agency's (JAXA) Kyoto & Carbon Initiative by Aberystwyth University, solo Earth Observation and the International Water Management Institute.
- Aims to provide open access geospatial information about mangrove extent and changes to the Ramsar Convention on Wetlands.
- In collaboration with Wetlands International and with support from DOB Ecology, the first GMW baseline maps were released in 2018 at the Ramsar COP13.
- The GMW maps also constitute the official mangrove datasets used by UNEP for reporting on Sustainable Development Goal 6.6.1 (change in the extent of water-related ecosystems over time).
- From a practical perspective, the GMA works worldwide in supporting research, advocacy, education and practical projects on the ground with local and community partners.

NATIONAL GEOSCIENCE AWARDS -2022

- The Ministry of Mines invites nominations for the National Geoscience Awards-2022 for contributions in the field of fundamental/applied geosciences, mining, and allied areas.
- The awards, instituted in 1966 and given annually, are an initiative of the Ministry to encourage geoscientists for striving toward excellence.

The National Geoscience Awards are of three categories:

- **National Geoscience Award for Lifetime Achievement:** Award for Lifetime Achievement (single award) shall be given to an individual with an exceptionally high lifetime achievement for sustained and significant contributions in any of the disciplines mentioned in Clause-2 of NGA Regulation 2022. The award carries a cash prize of Rs. 5,00,000/- and a certificate.
- **National Geoscience Award:** National Geoscience Award (10 Awards) shall be given to individuals or team(s) in recognition of meritorious contribution in any of the disciplines mentioned in Clause-2 of NGA Regulation 2022. Each award carries a cash prize of Rs. 3,00,000/- and a certificate. In the case of a team award, the award money will be equally divided.
- **National Young Geoscientist Award:** Young Geoscientist Award (single award) shall be given for outstanding research work in any field of geosciences to an individual below 35 years of age as on the 31st December 2021. The award carries a cash prize of Rs. 1,00,000 plus a research grant of Rs. 5,00,000/- spread over five years subject to satisfactory yearly progress and a certificate.

27TH COP OF UNFCCC

- All nations that signed the pact under UN Framework Convention on Climate Change (UNFCCC) are meeting in Sharm el-Sheikh, Egypt, at the COP27.

About current situation:

- As per the Paris Agreement on Climate Change of 2015, the focus is to drive down greenhouse gas emissions and keep the rise in average global temperature to well below 2°C and as close to 1.5°C as possible by the end of the century.
- Current temperature rise stands at 1.2°C to 1.3°C over the pre-industrial average, the highest in about 12,000 years since the last Ice Age.
- UNEP's Emissions Gap Report 2022 says global warming is projected to rise to 1.8°C with a 66% probability, even if all the Nationally Determined Contributions or NDCs (voluntary pledges submitted under the Paris pact) are implemented.
- At 2°C, up to 20% decline in snowmelt water for irrigation, diminished water for farming and human settlements due to glacier mass loss, and a two-fold increase in flood damage could happen, while up to 18% of species on land could go extinct.
- Global annual emissions during 2021 at 52.8 Gigatonnes (GtCO₂e), represents a slight increase compared to 2019, the pre-COVID year, and that the outlook for 2030 is not bright.
- The latest Sixth Assessment Report (SAR) of the IPCC says that biodiversity loss, Arctic ice loss, threat to coastal settlements and infrastructure, conflicts & migration of affected people and urban challenges to energy and water access could also arise.
- Tipping points means moments that cascade into irreversible changes, with a domino effect on other elements such as heat waves, Greenland ice sheet collapse, West Antarctic ice sheet collapse, thawing of the boreal permafrost, and tropical coral reef die offs, all of which are expected to happen at 1.5°C.
- G20 members account for 75% of emissions, although it is the richer countries that are responsible for accumulated emissions since the industrial revolution.

Objectives of COP27

- The COP27 is described as the conference of implementation.
- Aim: to review progress, raise ambition on emissions cuts and draw up funding plans to help vulnerable countries adapt to climate change.
- Countries most affected by the effects of a changing climate have been seeking loss and damage payments from the richer industrialised nations in the form of a separate loss and damage fund.
- To move away from fossil fuels and to peak emissions by 2025.
- "10 New Insights on Climate Science" released at COP27 – shows continuing high emissions from fossil fuels.

METHANE ALERT AND RESPONSE SYSTEM

- A new satellite-based system will now help governments detect methane emissions and tackle them.
- The Methane Alert and Response System (MARS) was launched at the 27th Conference of Parties (COP27) to the United Nations Framework Convention on Climate Change in Sharm El-Sheikh, Egypt.
- MARS is a part of global efforts to slow climate change by tackling the global warming gas.
- The data-to-action platform was set up as part of the UN Environment Programme's (UNEP) International Methane Emissions Observatory (IMEO) strategy to get policy-relevant data into the right hands for emissions mitigation.
- The system will be the first publicly available global system to connect methane detection to notification processes transparently.
- It will use state-of-the-art satellite data to identify significant emission events, notify relevant stakeholders, and support and track mitigation progress.
- MARS partners will also provide technical or advisory services, such as help in assessing mitigation opportunities.
- UNEP will monitor the event location and make the data and analysis available to the public between 45 and 75 days after detection.

Methane Gas

- Methane is an 80 times more potent greenhouse gas than carbon dioxide.
- It accounts for a small portion of human-induced greenhouse gas emissions compared to carbon dioxide.
- But it is thought to be 80 times more efficient than carbon dioxide at trapping atmospheric heat in the 20 years following its release.

Source of Methane Emissions:

- More than half of global methane emissions stem from human activities in three sectors: fossil fuels (35%), waste (20%) and agriculture(40%).
- **Fossil fuel sector:** Oil and gas extraction, processing and distribution account for 23%. Coal mining alone accounts for 12% of emissions.
- **Waste sector:** Landfills and wastewater make up about 20% of global anthropogenic emissions.
- **Agricultural sector:** Livestock emissions from manure and fermentation represent roughly 32%. Further, rice cultivation accounts for 8% of global anthropogenic emissions.
- India: Agriculture – 61%, Energy sector – 16.4%, waste – 19.8% (as per Global Methane tracker)
- Methane enters the atmosphere due to leaks in oil and gas industries, rearing livestock and the decomposition of waste in landfills.
- Currently, only 2 per cent of global climate finance goes to methane.
- Global methane emissions in 2030, can be reduced by 57 per cent using available strategies and technologies. This reduction can cause lower global warming by around 0.25°C in 2050 and 0.5°C by the end of the century.

More Information

- As UNEP’s Emissions Gap Report showed before this climate summit, the world is far off track on efforts to limit global warming to 1.5 degrees Celsius.
- We must cut methane emissions by at least 30 per cent by 2030 — the goal of the Global Methane Pledge — to keep the 1.5°C temperature limit within reach, according to the Intergovernmental Panel on Climate Change (IPCC).
- The global mean temperature in 2022 is currently estimated to be about 1.15 degrees Celsius (°C) above the 1850-1900 pre-industrial average,” with a range of 1.02°C to 1.28°C.
- National Aeronautics and Space Administration’s (NASA) scientists recently found 50 “super-emitters” of methane gas in central Asia, the west Asia and the southwestern United States.

CLIMATE CHANGE PERFORMANCE INDEX

- The latest Climate Change Performance Index by Germanwatch, an independent development organisation, has put India eighth amongst a group of 59 countries and the European Union in terms of climate action, ahead of most developed countries.
- The UK has been ranked 11, Germany 16, while China and the United States are placed at 51st and 52nd ranks respectively.
- Denmark and Sweden have been assessed to be the top performers this year as well.

Climate Change Performance Index:

- Climate Change Performance Index(CCPI) is an independent monitoring tool for tracking the climate protection performance of 60 countries and the EU, covering 92% of the Global Greenhouse Gas Emissions
- **Aim:** To enhance transparency in international climate politics and enable comparison of climate protection efforts and progress made by individual countries.

Categories:

- CCPI assesses each country’s performance in four categories:
- GHG Emissions (40% of the overall ranking),
- Renewable Energy (20%),
- Energy Use (20%) and

- Climate Policy (20%).

India's Performance

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

GLOBAL SHIELD FINANCING FACILITY

- The World Bank Group has announced a Global Shield Financing Facility to help developing countries access more financing for recovery from natural disasters and climate shocks.

About Global Shield Financing Facility Initiative

- The Global Shield Against Climate Risks initiative was launched at the 27th Conference of Parties (COP27) to the United Nations Framework Convention on Climate Change in Sharm El-Sheikh, Egypt.
- This facility will support the Global Shield Against Climate Risks, a joint initiative launched today at COP27 by the G7 and V20 to better protect poor and vulnerable people from disasters by pre-arranging more financing before disasters strike.
- The Global Shield Financing Facility will channel grants to developing countries through World Bank projects or through projects prepared by other participating partners, including UN agencies and multilateral development banks.
- It will also work closely with key stakeholders, such as civil society organizations, risk pools, private sector and humanitarian partners.
- Pakistan, Bangladesh, Costa Rica, Fiji, Senegal, Philippines and Ghana will be the first to receive assistance under this initiative.
- The initial contributions for this initiative are provided Germany, Denmark, Ireland and Canada.

About V20 Countries

- Vulnerable Twenty (V20) Group of Ministers of Finance of the Climate Vulnerable Forum is a dedicated cooperation initiative of economies systemically vulnerable to climate change.
- It was established on 08 October 2015 at Lima, Peru.
- It's primary objective is to promote the mobilisation of climate finance.
- Survive Thrive #1.5C aims to promote actions to keep warming below 1.5°C and urges people to get involved and keep updated on limiting global warming to 1.5°C.
- The call to create the V20 originated from the Climate Vulnerable Forum's Costa Rica Action Plan (2013-2015) in a major effort to strengthen economic and financial responses to climate change.
- It foresaw a high-level policy dialogue pertaining to action on climate change and the promotion of climate resilient and low emission development with full competence for addressing economic and financial issues beyond the remit of any one organization.

- The V20 is a bloc consists of countries most threatened by climate change including's members are Afghanistan, Bangladesh, Barbados, Bhutan, Costa Rica, East Timor, Ethiopia, Ghana, Kenya, Kiribati, Madagascar, the Maldives, Nepal, the Philippines, Rwanda, Saint Lucia, Tanzania, Tuvalu, Vanuatu and Vietnam.

RED CROWNED ROOFED TURTLE

- India has put forward a proposal to better protect a species of freshwater reptile called the red-crowned roofed turtle (*Batagur kachuga*) under the Convention on International Trade in Endangered Species (CITES).
- The turtle, native to India and Bangladesh, is at a high risk of extinction.
- In the CITES COP19 agenda, countries have proposals to amend the appendices for wild animals, which include transferring hippopotamus, straw-headed bulbul, red-crowned roofed turtle and African elephant to Appendix I.
- It also proposes to include requiem and hammerhead sharks in Appendix II.

The Red Crowned Roofed Turtle

- Red Crowned Roofed Turtle is a species of freshwater turtle endemic to South Asia.
- The last known stronghold for this river turtle is on the Chambal River in central India, however, small isolated populations may still exist in the Ganges and Brahmaputra river basins.
- IUCN Status: Critically Endangered
- Indian Wildlife (Protection) Act of 1972: Schedule I

Threats

- The list cites threats like habitat loss due to pollution and hydrological projects specific in the Ganga lowlands of northern India and Bangladesh.
- Overharvesting the animal for illegal consumption and illegal international trade are other reasons for its extinction threat.
- Over 11,000 tortoises and freshwater turtles have been seized in India from 2009-2019, found a study by TRAFFIC, a global NGO working on trade in wild animals and plants and their conservation.
- The poached animals were illegally traded year after year and identification were absent in 51.5 per cent of the cases.

About CITES

- It is an international agreement between governments.
- CITES regulates international trade in specimens of species of wild fauna and flora based on a system of permits and certificates issued under certain conditions.
- It covers export, re-export, import and landing from the high seas of live and dead animals and plants and their parts and derivatives.
- CITES has now 183 Parties. Not all members of the United Nations are Parties to the Convention.
- The CITES Secretariat is hosted by the **United Nations Environment Programme (UNEP)**.
- It was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union).
- The text of the Convention was finally agreed at a meeting of representatives of 80 countries in Washington, D.C, on 3 March 1973, and on 1 July 1975 CITES entered in force.
- It is legally binding on the Parties – in other words they have to implement the Convention.
- It does not take the place of national laws. Rather it provides a framework to be adopted by parties in its own domestic legislation to ensure that CITES is implemented at the national level.

CLIMATE CHANGE PERFORMANCE INDEX (CCPI) 2023

CCPI 2023 was released in COP 27, assessing 59 countries and the European Union on climate change policies and actions.

Climate Change Performance Index

- Climate Change Performance Index(CCPI) is an independent monitoring tool for tracking the climate protection performance of 59 countries and the European Union which together generate over 92% of global greenhouse gas emissions.
- It aims to enhance transparency in international climate politics and enable comparison of climate protection efforts and progress made by individual countries.
- Published by German Watch, New Climate Institute and Climate Action Network International based in Germany.
- The CCPI aims to enhance transparency in international climate politics and enables comparison of climate protection efforts and progress made by individual countries.
- CCPI assesses each country's performance in four categories:
 - GHG Emissions (40% of the overall ranking),
 - Renewable Energy (20%),
 - Energy Use (20%)
 - Climate Policy (20%).

India's Performance

- India has been ranked 8th amongst a group of 59 countries and the European Union. It has risen two spots since last year.
- Parameter-wise, India has earned a high rating in the GHG Emissions and Energy Use categories with a medium for Climate Policy and Renewable Energy.
- India had increased its climate targets in the NDC (nationally determined contributions) and also announced a net zero target for 2070.
- However, India's climate actions were still not consistent with the 1.5 degree Celsius goal. For instance, India has plans to increase its oil and gas production by over 5% by 2030. This is incompatible with the 1.5-degree Celsius target.

Global Ranking

- Denmark and Sweden have been assessed to be the top performers this year as well.
- China has been ranked 51st. It has dropped 13 places mainly because of the country's continued reliance on coal and lack of clarity on long-term climate policies.
- The United States has been ranked 52nd. It has risen three ranks because of the recent climate measures announced by the US administration.

Question: What are the main features approved by India in NDC (nationally determined contributions) to be communicated to the United Nations Framework Convention on Climate Change (UNFCCC) ?

PANGOLINS

- The 19th Conference of Parties (COP19) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) urged countries to remove references to parts and derivatives of pangolins "from the official pharmacopoeia" to help save the species.
- The pangolin is 'the most trafficked animal in the world'. Pangolins are listed in Appendix I of CITES in accordance with the International Union for the Conservation of Nature's Red List.
- This means that the species is threatened with extinction. There are eight species of pangolins in the world of which the Indian Pangolin (*Manis crassicaudata*) and the Chinese Pangolin (*Manis pentadactyla*) are found in India.

About the Pangolin

- They are scaly anteater mammals of the order Pholidota.

The Pangolin Conservation Status:

- **IUCN Status:** Endangered (India- Endangered, Chinese Pangolin- Critically Endangered)

- Wildlife Protection Act, 1972: Under Schedule I of WPA, 1972

Animal Description

- It has large, overlapping scales on its body that act as armour.
- It can also curl itself into a ball (volvation) as self-defence against predators such as the tiger.
- The nocturnal animal lives in burrows and feed on ants and termites.

Indian Pangolin

- Indian Pangolin is a large anteater covered by 11-13 rows of scales on the back. A terminal scale is also present on the lower side of the tail of the Indian Pangolin, which is absent in the Chinese Pangolin.
- The species is found in various types of tropical forests as well as open land, grasslands, and degraded habitats, including in close proximity to villages.
- Indian Pangolin is widely distributed in India, except the arid region, high Himalayas and the North-East. It can be found at elevation up to 2500 m. The species also occurs in Bangladesh, Pakistan, Nepal and Sri Lanka.

Chinese Pangolin

- It is found in the Himalayan foothills in Eastern Nepal, Bhutan, Northern India, North-East Bangladesh and through Southern China.
- It is adaptable to a wide range of habitats including primary and secondary tropical forests, limestone and bamboo forests, grasslands, and agricultural fields.

Threats

- Trafficking of live pangolin and its scales is a highly lucrative business for the organized mafia who exploit poor and vulnerable forest-dwelling communities for their criminal interests.
- Hunting and poaching for local consumptive use (e.g. as a protein source and traditional medicine) and international trade, for its meat and scales.
- Heavy Deforestation of their Habitat.

Convention on International Trade in Endangered Species (CITES)

- It is an international agreement between governments.
- CITES regulates international trade in specimens of species of wild fauna and flora based on a system of permits and certificates issued under certain conditions.
- It covers export, re-export, import and landing from the high seas of live and dead animals and plants and their parts and derivatives.
- CITES has now 183 Parties. Not all members of the United Nations are Parties to the Convention.
- The CITES Secretariat is hosted by the United Nations Environment Programme (UNEP).

Origin

- It was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union).
- The text of the Convention was finally agreed at a meeting of representatives of 80 countries in Washington, D.C, on 3 March 1973, and on 1 July 1975 CITES entered in force.

Question: How far the Convention on International Trade in Endangered Species (CITES) is able to control international of species? Discuss.

BEARCAT

- The police and forest officials in the Manipur's Ukhrul town have been scanning "gambling dens" following reports of wild animals – dead or alive – being offered as prizes for raffle draws.

Betting for Exotic Meat in Manipur

- Wildlife activists said that there have been instances of people buying raffle draw tickets ranging from ₹100 to ₹500 to try their luck to win exotic meat.
- The larger or rarer the bird or animal or body part, the higher the price of the ticket.
- Apart from wild boars and deer, animals such as binturong (an arboreal mammal also known as bearcat), squirrels and flying foxes (bats) have been found to be on offer.
- Different types of birds such as the grey-sided thrush and tragopans (often called horned pheasants) have also been spotted.

Binturong

- Binturong, (*Arctictis binturong*), also called bear cat or cat bear, catlike omnivore of the civet family (*Viverridae*), found in dense forests of Southeast Asia.
- Its range extends from Nepal, India, and Bhutan southward to the Indonesian islands of Sumatra and Java and eastward to Borneo.
- It has long shaggy hair, tufted ears, and a long, bushy, prehensile tail. The colour generally is black with a sprinkling of whitish hairs.
- The head and body measure about 60–95 cm (24–38 inches) and the tail an additional 55–90 cm (22–35 inches); weight ranges from about 9 to 14 kg (20 to 31 pounds).
- The binturong is principally nocturnal and crepuscular (that is, active during twilight).
- It is found most often among the trees, using its prehensile tail as an aid in climbing. It feeds mainly on fruit, such as figs, but it also takes eggs and small animals.
- In some areas binturongs are tamed and have been reported as being affectionate pets.
- Binturongs are classified as a vulnerable species by the International Union for Conservation of Nature and Natural Resources.

ECOLOGY

INVASIVE SPECIES

- An invasive species, *Senna spectabilis*, an exotic tree, has taken over between 800 and 1,200 hectares of the buffer zones of the Mudumalai Tiger Reserve (MTR) in the picturesque Nilgiris hill district.
- The Forest Department is coming up with a comprehensive strategy to deal with the spread of the invasive species, which continues to spread rapidly in the buffer zone.

About

- Introduced as an ornamental species and for use as firewood from South and Central America, the species has become highly invasive in the Sigur plateau in both the core and buffer zones of the MTR.
- Over the last few years, its bright yellow flowers have become more visible across the Tiger Reserve, with conservationists stating that the invasive weed has a negative effect on local biodiversity, crowding out native species and limiting food availability for wildlife.
- The Forest Department was also formulating a 10-year-plan to systematically remove *Lantana camara*, the other major weed that poses a threat to biodiversity in both the core and buffer zones of the Tiger Reserve.

Five major invasive weeds

- *Senna spectabilis*
- *Lantana camara*
- Wattle
- Eucalyptus and
- Pine
- Eucalyptus and Pine though exotic, do not spread as quickly as the other species and are considered easier to manage,

Invasive Species

- An alien species is a species introduced outside its natural past or present distribution; if this species becomes problematic, it is termed an invasive alien species. The climate change, movement of people and goods around the world increases the threat for introduction of invasive alien species.

Threat posed by invasive alien species on native ecosystem:

- Invasive alien species are the most common threat to amphibians, reptiles and mammals on The IUCN Red List.
- They may lead to changes in the structure and composition of ecosystems detrimentally affecting ecosystem services, human economy and wellbeing.
- Worldwide, invasive alien species constitute one of the leading threats to biodiversity, second only to the destruction and fragmentation of entire habitats.
- Alien species may threaten indigenous species by competing with them for the same resources, by predation, by spreading diseases or parasites, or by cross-breeding with these species in the wild.
- Alien species are also known to have changed the structure of food chains and to have affected the functioning of entire ecosystems.
- Invasive alien species cause harmful social impacts and substantial financial losses to a variety of actors.
- Many invasive alien species are major pests for agriculture and forestry industries.
- Fishing and fish farming may also suffer from the spread of invasive alien species.
- Alien species can also pose a health hazard or function as disease carriers.

Examples of Invasive species:

- *Ipomoea (Ipomoea carnea)*
- *Mimosa (Mimosa himalaica)*

- Parthenium (*Parthenium hysterophorus*) is believed to have come to India as contaminants in a consignment of wheat imported from the U.S. in the 1950s
- Lantana (*Lantana camara*) was brought by the British as ornamental plants from South America two centuries ago.
- Bombax ceiba (locally called Semul)
- *Largastroemia speciosa* (locally called ejhar)

DOLPHINS

- Dolphins have started coming back to the Ganga River with improvement in the quality of its water through the Namami Gange programme.
- The completion of 23 projects under the ambitious programme started in 2014.
- The State has successfully stopped flowing of more than 460 MLD of sewage into the Ganga in the State.
- Dolphins have also been seen breeding in Brijghat, Narora, Kanpur, Mirzapur and Varanasi, which is likely to increase their number further in the coming days.
- At present, the population of dolphins in Ganga in Uttar Pradesh is estimated to be around 600.
- There has been a lot of improvement in dissolved oxygen (DO), biochemical demand (BOD) and fecal coliform (FC) parameters as well, the assessment of river water quality carried out during the period 2014-2022 at 20 locations in Uttar Pradesh reveals.
- The test found that pH (how acidic the water was) at 20 locations met the water quality criteria for bathing, while DO, BOD and FC improved at 16, 14 and 18 out of 20 locations, respectively.

Namami Gange Programme:

- The Programme was launched in 2014. It is an Integrated Conservation Mission under the Ministry of Jal Shakti.
- To achieve effective abatement of pollution, conservation and rejuvenation of the National River(Ganga).
- Chacha Chaudhary is the declared Mascot.

Main Pillars of the Programme:

- Sewerage Treatment Infrastructure,
- River-Surface Cleaning,
- Afforestation,
- Industrial Effluent Monitoring,
- River-Front Development,
- Biodiversity
- Public Awareness among others.

National Mission for Clean Ganga(NMCG):

- It is the implementing agency of the Namami Gange Programme at the national level.
- It is a statutory authority. It is established under the National Council for River Ganga (Rejuvenation, Protection and Management) Act, 2016.
- **Projects under the programme:**
- Sewerage infrastructure works for pollution abatement is under execution on 13 tributaries of river Ganga.
- These include Yamuna, Kosi, Saryu, Ramganga, Kali(West), Kali (East), Gomti, Kharkari, Burhi Gandak, Banka, Damodar, Rispana-Bindal and Chambal.

Need of the Programme

- Rising in the Himalayas and flowing to the Bay of Bengal, the river traverses a course of more than 2,500 km through the plains of north and eastern India.
- The Ganga basin – which also extends into parts of Nepal, China and Bangladesh – accounts for 26 per cent of India's landmass.

- The Ganga also serves as one of India's holiest rivers whose cultural and spiritual significance transcends the boundaries of the basin.
- Rapidly increasing population, rising standards of living and exponential growth of industrialization and urbanization have exposed water resources to various forms of degradation.
- The deterioration in the water quality of Ganga impacts the people immediately.
- Major components of the project will be Wetland inventory and assessment, Wetland management planning, Wetland's monitoring, and Capacity development and outreach.
- Aims at creating a knowledge base and capacities for effective management of floodplain wetlands in the 12 Ganga districts in Bihar to ensure sustained provision of wetlands ecosystem services and securing biodiversity habitats.

RHINO

- The horns of rhinoceroses may have become smaller over time due to the impact of hunting, according to a recent study which used an interesting research approach—analysing artwork and photographs of the animal spanning more than five centuries.
- The study, published in the latest edition of People and Nature by the British Ecological Society, relied on a repository of images maintained by the Netherlands-based Rhino Research Center (RRC).

Key Findings

- Found evidence for declining horn length over time across species, perhaps related to selective pressure of hunting, and indicating a utility for image-based approaches in understanding societal perceptions of large vertebrates and trait evolution.
- Rhinos have long been hunted for their horns, which are highly valued in some cultures.
- The five surviving rhino species are still threatened by habitat loss and hunting.
- The study found that the rate of decline in horn length was highest in the critically-endangered Sumatran rhino and lowest in the white rhino of Africa, which is the most commonly found species both in the wild and in captivity.
- This observation follows patterns seen in other animals, such as tusk size in elephants and horn length in wild sheep, which have been driven down by directional selection due to trophy hunting.
- During the age of European imperialism (between the 16th and 20th centuries), rhinos were commonly portrayed as hunting trophies, but since the mid-20th century, they have been increasingly portrayed in a conservation context, reflecting a change in emphasis from a more to less consumptive relationship between humans and rhinos.
- The Indian rhino featured more in early artwork, but the number of images of other species, particularly white rhinos, has increased since the mid-19th century.

Rhinos

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

IUCN Status

- Greater one horned Rhino: Vulnerable
- Sumatran Rhino: Critically Endangered
- Javan Rhino: Vulnerable
- Black African Rhino: Critically Endangered
- White African Rhino: Near Threatened
- Also known as Indian rhino, it is the largest of the rhino species.
- India is home to the largest number of Greater One-Horned Rhinoceros in the world.
- At present, there are about 2,600 Indian rhinos in India, with more than 90% of the population concentrated in Assam's Kaziranga National Park.

Habitat:

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

Threats:

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

APIS KARINJODIAN THE INDIAN BLACK HONEYBEE

- A new species of endemic honeybee has been discovered in the Western Ghats. The new species has been named *Apis karinjodian* and given the common name Indian black honeybee.

About *Apis karinjodian*

- A new species of honeybee has been spotted from the Western Ghats after a gap of more than 200 years.
- The last honeybee described from India was *Apis indica* in 1798 by Fabricius.
- Although Fabricius named the Indian bee *Apis indica*, it was not considered a valid species till now.
- The research team restored the status of *Apis indica* based on a new measure for species discrimination in honeybees termed 'Radio-Medial Index (RMI).'
- *Apis karinjodian* has evolved from *Apis cerana* morphotypes that got acclimatised to the hot and humid environment of the Western Ghats.
- Molecular analysis of mitochondrial DNA was also carried out and molecular sequence data available in the public open database NCBI-GenBank also helped confirm the species status of the new honeybee.
- The distribution of *Apis karinjodian* ranges from the central Western Ghats and Nilgiris to the southern Western Ghats, covering the States of Goa, Karnataka, Kerala and parts of Tamil Nadu.
- The species has been classified as **near threatened (NT)** in the State based on the IUCN Red List Categories and Criteria.
- Till date, only a single species, *Apis cerana* was noted across the plains of central and southern India and Sri Lanka as a 'fairly uniform population' in the Indian subcontinent.

Significance

- The research has given a new direction to apiculture in the country by proving that it has three species of cavity nesting honey bees viz., *Apis indica*, *Apis cerana*, and *Apis karinjodian*, the last being visibly dark in appearance.
- The ability of the Indian black honeybee to produce higher quantities of honey, which is thicker in consistency, opens up new avenues for increasing honey production.
- The new find has increased the species of honeybees in the world to 11.

COP14 TO THE RAMSAR CONVENTION ON WETLANDS

- The 14th Meeting of the Conference of the Contracting Parties (COP14) to the Ramsar Convention on Wetlands began to discuss the state of wetlands globally.
- Among the items on the agenda is a draft resolution by China to host an international mangrove centre.
- The event is being held in two different venues: Wuhan in China and Geneva in Switzerland from November 5-13.
- Items on the agenda include
- Waterbird population estimates
- Ramsar Convention criteria

- Lists of wetlands of international importance
- Conservation of small wetlands among others.
- The draft resolution on establishment of the International Mangrove Center in the framework of the Ramsar Convention' has been submitted by China and is cosponsored by Cambodia and Madagascar.

Mangroves

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

Significance of Mangroves

- Ecological Stabilisation: Ecologically mangroves are important in maintaining and building the soil, as a reservoir in the tertiary assimilation of waste.
- They provide protection against cyclones.
- They play a significant role in promoting land accretion, fixation of mud banks, dissipation of winds, tidal and wave energy.
- The dense tangle of roots allows the trees to handle the daily rise and fall of tides.
- Most mangroves get flooded at least twice per day.
- Mangrove forests stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides.
- Mangroves improve the water quality by absorbing nutrients from runoff otherwise cause harmful algal bloom offshore.
- The mangrove ecosystem also supports an incredible diversity of creatures including some species unique to mangrove forests.
- They provide habitat and refuge to a wide array of wildlife such as birds, fish, invertebrates, mammals and plants.
- Cover just 0.1% of the planet's surface but store up to 10x more carbon per hectare than terrestrial forests. This means that conserving and restoring mangroves is essential to fighting climate change, the warming of the global climate fuelled by increased carbon emissions, that is already having disastrous effects on communities worldwide.
- Intact and healthy mangrove forests have an potential for sustainable revenue-generating initiatives including ecotourism, sport fishing, and other recreational activities.

Ramsar Convention

- Wetlands have been subjected to destruction and degradation due to human activities such as agriculture, urban and rural development, industrial and municipal pollution.
- According to global estimates, the extent of wetland in the world has declined between 64-71% in the 20th century.
- As a result, the ecosystem services that wetlands provide to society have declined drastically.

- In order to address this issue, the Ramsar convention was put forward to drive international attention to wetland decline and degradation.

About Ramsar Convention

- It is an intergovernmental environmental treaty that calls for international cooperation and national action to safeguard and sustainably use wetlands.
- The official name for the convention is the Convention on Wetlands of International Importance, especially as Waterfowl Habitat. It is the first and only global treaty for the conservation of a particular ecosystem.
- The Convention was signed on 2nd February 1971 in the Iranian city of Ramsar. This is where it gets its name from-The Ramsar Convention. 2nd February is celebrated as World Wetlands Day every year.
- The Convention entered into force in 1975. As of 2019, it has 171 member states including India.
- It is important to note that the Ramsar Convention is not legally binding i.e. it has no punitive sanctions for violations upon treaty commitments. It is also not part of the United Nations and UNESCO system of environmental conventions and agreements.

HIMALAYAN GRAY LANGUR

- Differences in altitude make a primate species in the same Himalayan habitat choose between flowers and fruits as food options beyond their staple menu of leaves, a new study has revealed.

Himalayan Gray Langur

- The Himalayan Gray Langur or the Chamba Sacred Langur (*Semnopithecus ajax*) is a colobine, meaning leaf-eating monkey.
- It is considered an endangered species globally as its population is estimated to be less than 1,500 mature individuals in 15-20 groups.
- The Himalayan Gray Langur was once considered a sub-species of the *Semnopithecus entellus*, commonly known as the Bengal Sacred Langur or Hanuman Langur, but it was separated as a species in 2005.
- In India, most langurs comes under the genus *Semnopithecus*.
- Prior to 2001, *Semnopithecus entellus* (Hanuman Langur) was considered only one species, with several subspecies.
- It was in 2001 that these subspecies were recommended as separate species under the genus *Semnopithecus*.
- Accordingly, seven different species have been recognised which include *Semnopithecus ajax*.
- In the Indian Subcontinent, their distribution is reported from Himachal Pradesh, Jammu and Kashmir and from Pakistan and Nepal.
- *S ajax* is an endangered species according to the International Union for Conservation of Nature Red List but after reassessment in 2004, it was re-designated as 'Critically Endangered'.
- It is considered endangered due to its restricted range habitat.

Findings

- Three primatologists studied the diet composition of five such groups in and around the Kalatop-Khajjiar Wildlife Sanctuary in Himachal Pradesh between September and November 2020.
- They especially concentrated on two groups, one inhabiting the Kalatop forest at an average altitude of 2,396 metres, and the other based in the Khajjiar forest at an average altitude of 2,188 metres.
- The domains of the two groups were only 208 metres apart, but the altitudinal gap made a huge difference when the monkeys took a break from feeding on the leaves of some 20 species of plants, primarily the Himalayan ivy (*Hedera nepalensis*) and the Himalayan oak (*Quercus oblongata*).
- While the Kalatop group satisfied their craving for something different by feeding on flowers.
- The Khajjiar group ate fruits for a change of taste.
- Flowers and fruits constituted 11.11% and 15.49% of the diet of the two groups respectively.

- As per the BIOTECH-PRIDE guidelines of the Government of India, IBDC is mandated to archive all life science data generated from publicly-funded research in India.

Features

- IBDC has accumulated over 200 billion bases from 2, 08, 055 submissions from more than 50 research labs across India.
- IBDC dashboard provides customized data submission, access, data analysis services, and real-time SARS-CoV-2 variant monitoring across India.
- IBDC is mandated to archive all life science data generated from publicly-funded research in India.
- Supported by the Department of Biotechnology (DBT), it has been established at Regional Centre of Biotechnology (RCB), Faridabad with a data 'Disaster Recovery' site at National Informatics Centre (NIC), Bhubaneswar.
- It has a data storage capacity of about 4 petabytes and houses the 'Brahm' High Performance Computing (HPC) facility.
- The computational infrastructure at IBDC is also made available for researchers interested in performing computational-intensive analysis.

LAKE-EFFECT SNOW

- Bitter cold air sweeps across the relatively warmer Great Lakes, it sucks up more and more moisture that falls as snow. These extreme snowfall events happen periodically along the eastern edges of the Great Lakes of North America. The phenomenon is called "lake-effect snow," and the lakes play a crucial role.

Lake-Effect Snow Formation

- Lake-effect snow is strongly influenced by the differences between the amount of heat and moisture at the lake surface and in the air a few thousand feet above it.
- A big contrast creates conditions that help to suck water up from the lake, and thus more snowfall.
- A difference of 25 degrees Fahrenheit (14 Celsius) or more creates an environment that can fuel heavy snows.
- This often happens in late fall, when lake water is still warm from summer and cold air starts sweeping down from Canada.
- More moderate lake-effect snows occur every fall under less extreme thermal contrasts.
- The wind's path over the lakes is important too. The farther cold air travels over the lake surface, the more moisture is evaporated from the lake.
- A long "fetch" – the distance over water – often results in more lake-effect snow than a shorter one.

Will climate change affect lake-effect snow?

- Human-caused climate change has the potential to intensify lake-effect snow events, at least in the short term, according to the NOAA's U.S. Climate Resilience Toolkit.
- "Ice cover extent and lake water temperatures are the main controls on lake-effect snow that falls downwind of the Great Lakes,"
- The predictions change once lake temperatures rise to a point when much of what now falls as snow will instead fall as rain."
- Lake-effect snow frequently pummels the Great Lakes with feet of wet snow that can trap people in their homes and covers cars.

GREAT KNOT

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

- The migratory bird that traversed the Central Asian Flyway (CAF) is only one of the two — the other has been sighted at Jamnagar in Gujarat — great knots to be re-sighted in India among the nearly thousand ones tagged with MOSKVA rings in the Kamchatka peninsula in eastern Russia.

Great Knot

- Great Knot (*Calidris tenuirostris*) is a small wader or shorebird. It is a medium-sized shorebird with a straight, slender bill of medium length and a heavily streaked head and neck.
- It is an international migratory wading bird that travels vast distances between the Northern Hemisphere breeding grounds and Southern Hemisphere summer feeding grounds.
- **IUCN Status:** Endangered
- **Distribution:** Great Knots occur around coastal areas in many parts of Australia during the southern summer. They breed in eastern Siberia, and when on migration they occur throughout coastal regions of eastern and Southeast Asia.
- **Habitat:** In Australia, Great Knots inhabit intertidal mudflats and sandflats in sheltered coasts, including bays harbours and estuaries. They forage on the moist mud, and they often roost on beaches or in nearby low vegetation, such as mangroves or dune vegetation.
- **Threats:** Loss of intertidal stopover habitats in the Yellow Sea region is thought to be a key driver in the population declines of shorebirds
- It is also potentially threatened by climate change.
- Recent evidence shows a very rapid population decline caused by the reclamation of non-breeding stopover grounds, and under the assumption that further proposed reclamation projects will cause additional declines in the future.

OLIVE RIDLEYS TURTLE

- A large number of the endangered Olive Ridley turtles have started arriving for mating at the Gahirmatha marine sanctuary.
- “Olive Ridley turtles usually start mating in the sea near their preferred nesting coast in November and December. After the end of the mating season, most male turtles return leaving behind the females to lay eggs,”

About Olive Ridley turtles:

- These are the smallest and most abundant of all sea turtles found in the world.

Olive Ridley turtles Conservation status:

- IUCN Red List: Vulnerable
- CITES: Appendix I
- Indian Wildlife (Protection) Act, 1972: Schedule I

Characteristics of Olive Ridley turtles

- They are found in warm waters of the Pacific, Atlantic and Indian oceans.
- Males and female Olive Ridley grow to the same size. However, the females have a slightly more rounded carapace(shell) as compared to the male.
- These turtles are carnivores. They feed mainly on jellyfish, shrimp, snails, crabs, molluscs and a variety of fish and their eggs.
- They spend their entire lives in the ocean. Further, they migrate thousands of kilometres between feeding and mating grounds in a year.
- The major threats to Olive Ridley turtles are: a) Poor fishing practices, b) Development and exploitation of nesting beaches for ports, and tourist centres, c) Poaching for their meat, shell and leather.

Arribada (Mass Nesting) of Olive Ridley Turtles

- They are best known for their unique mass nesting called Arribada. Under this, thousands of females come together on the same beach to lay eggs.
- Each female digs a sandpit lays 90 to 120 eggs and promptly closes the pit before leaving the shore.
- The coast of Odisha in India is the largest mass nesting site for the Olive-ridley. This is followed by the coasts of Mexico and Costa Rica.
- To reduce accidental killing in India, the Odisha government has made it mandatory for trawls to use Turtle Excluder Devices (TEDs), a net specially designed with an exit cover which allows the turtles to escape while retaining the catch.

Gahirmatha marine sanctuary

- The Odisha coast has three arribada beaches at Gahirmatha, the mouth of the Devi river, and in Rushikulya, where about 1 lakh nests are found annually.
- It extends from Dhamara river mouth in the north to Brahmani River mouth in the south.
- The Gahirmatha Marine Wildlife Sanctuary is the only marine sanctuary of Orissa.
- In 1997 the Government of Orissa declared the area as Gahirmatha Marine Sanctuary considering its ecological significance and diverse floral and faunal resources.
- The Gahirmatha marine sanctuary in Odisha is considered the world's largest nesting beach for Olive Ridleys.
- The Rushikulya river mouth is considered the second-biggest nesting site for Olive Ridley Turtles in India.
- Recently, a new mass nesting site has been discovered in the Andaman and Nicobar Islands. As per reports, it has more than 5,000 nests in a season.

SUKHATAL

- Hearing a suo motu Public Interest Litigation (PIL) on preservation of Sukhatal Lake in Nainital, the Uttarakhand High Court on Tuesday directed the State to stop all construction activities on the lakebed and posted the matter for further hearing.

About Lake Sukhatal

- Sukha Tal cocooned in Mallital was earlier a part of the pristine Nainital Lake. Sukha Tal or Suka Tal literally suggests dry lake which is located half a km from the picturesque lake of Nainital.
- It is a fresh water lake surrounded by the dense pine and oak forests.
- It is believed that Sukhatal is a feeder lake for Naini Lake, as it acts as upstream storage for Naini Lake during monsoon by holding the runoff from catchment of water that would have otherwise flown out, thereby increasing erosion and silt deposition in Naini Lake.
- Sukhatal is a feeder lake for Naini Lake, as it acts as upstream storage for Naini Lake during monsoon by holding the runoff from catchment of water that would have otherwise flown out,
- Thereby increasing erosion and silt deposition in Naini Lake. Studies show encroachment and dumping of construction and other waste have led to unprecedented deterioration of Sukhatal lakebed and its ability to recharge Naini Lake.
- Since 2000, Naini Lake has reached zero level —minimum water level to be maintained — on at least 10 occasions.

About Naini Tal Lake

- Nainital Lake, notably known as Naini Lake is the main attraction of Nainital town as well of Uttarakhand. Bounded by panoramic seven hills, Nainital Lake is a much loved spot among romantic travellers around the planet.
- This lake was found long back in 1839 by P. Baron and is at an altitude of 2,000 meters above sea level which makes it one of the most visited lakes in India.
- At the foot of the Kumaon Hills in the Indian state of Uttarakhand lies a stunning hill-station called Nainital surrounded by a number of hills; Mount Ayarpatha, Mount Naina and Mount Deopatha being the most important ones.
- In fact, the name of the town, Nainital, which can be decoded to 'Lake of the Eye' with 'Naina' meaning 'eye' and 'tal' meaning 'lake', originated from this lake's name

SOUTHERN WHITE RHINO

- In a major setback to rhino conservation in Africa, the proposal to downgrade the status of southern white rhino from Appendix I to Appendix II was accepted at the 19th Conference of Parties (COP19).
- The COP19, organised by Convention on International Trade in Endangered Species (CITES) in Panama City, accepted the proposal by Botswana and Namibia to degrade the status. Wild animal species listed in Appendix I include those threatened with extinction.
- The animals named under Appendix II may not necessarily be threatened with extinction, but trade of such species should be controlled to ensure it does not threaten their existence.
- The proposal was confirmed after it received 83 votes in favour, 31 against it and 13 abstentions.

White Rhino

- Southern White rhinos are the second largest land mammal after the elephant.
- White rhinos are also known as the square-lipped rhinoceros due to their square (not pointed) upper lip.
- Two genetically different subspecies exist, the northern and southern white rhino and are found in two different regions in Africa.
- The IUCN Status of White Rhino is Near Threatened. The IUCN status of its subspecies is as follows:
- Northern White Rhino: Critically Endangered
- Southern White Rhino: Near Threatened

Southern White Rhino

- The southern white rhino and northern white rhino are subspecies of the white rhino. Aside from living in different parts of Africa, they differ slightly in the shape of their teeth and heads, appearance of skin folds, and amount of hair.
- In general, southern whites are a little larger and hairier. Contrary to the species name, both subspecies are Gray in colour.
- “White” may be taken from the Afrikaans word for “wide,” in reference to their mouths, which are wide and square to help them graze on grass.
- Common Name: Southern white rhinoceroses
- Scientific Name: *Ceratotherium simum simum*
- Diet: Herbivore

Habitat and behavior:

- Nearly 99 percent of southern white rhinos live in the savannas of Kenya, Namibia, and Zimbabwe, though the vast majority are found in South Africa.
- White rhinos are semi-social and territorial. They stay together in herds on the grassy plains and mark their territory with strategically placed deposits of dung.
- Threats: It is mostly threatened by habitat loss, continuous poaching in, and the high illegal demand for rhino horn for commercial purposes and use in traditional Chinese medicine.

NEW SPECIES OF BLACK CORALS

- Scientists discover five new species of black corals living thousands of feet below the ocean surface near the Great Barrier Reef.
- Australian scientists used the Schmidt Ocean Institute’s remotely operated vehicle – a submarine named SuBastian – to explore the Great Barrier Reef and Coral Sea.

About black corals:

- Black corals can be found growing both in shallow waters and down to depths of over 26,000 feet (8,000 meters), and some individual corals can live for over 4,000 years.
- Many of these corals are branched and look like feathers, fans or bushes, while others are straight like a whip.

- Unlike their colourful, shallow-water cousins that rely on the sun and photosynthesis for energy, black corals are filter feeders and eat tiny zooplankton that are abundant in deep waters.
- Black corals or antipatharians are colonial animals which are related to sea anemones and stony corals.
- They are named for the colour of their stiff, black or brownish skeleton.
- More than 150 species of black corals have been described. At least 14 species of black corals are currently known from Hawai'i.
- Distribution: Black corals are found in all oceans, but are most common in deep water habitats of tropical and subtropical seas.
- Black corals are carnivores.

Corals

- Corals are marine invertebrates or animals not possessing a spine. Each coral is called a polyp and thousands of such polyps live together to form a colony, which grows when polyps multiply to make copies of themselves.

Types of corals: Hard coral and soft coral.

- **Hard corals**, also called hermatypic or 'reef building' corals extract calcium carbonate (also found in limestone) from the seawater to build hard, white coral exoskeletons.
- **Soft coral polyps**, however, borrow their appearance from plants, attach themselves to such skeletons and older skeletons built by their ancestors. Soft corals also add their own skeletons to the hard structure over the years and these growing multiplying structures gradually form coral reefs. They are the largest living structures on the planet.

The major types of coral reefs are:

- **Fringing Reefs:** These are coral reefs that grow in shallow waters and in areas of low rainfall runoff, primarily on the leeward side. They closely border the coastline or are separated from it by a narrow stretch of water.
- **Barrier reefs:** These grow parallel to the coast, but are separated from land by a lagoon. Example: Great Barrier reef, Queensland, Australia
- **Atolls:** These grow surrounding (or partly surrounding) an island which then sinks relative to sea level. Example: Maldives consists of 26 atolls.

What is coral bleaching?

- Bleaching happens when corals experience stress in their environment due to changes in temperature, pollution or high levels of ocean acidity.
- Under stressed conditions, the zooxanthellae start producing reactive oxygen species, which are not beneficial to the corals. So, the corals expel the colour-giving zooxanthellae from their polyps, which exposes their pale white exoskeleton, giving the corals a bleached appearance. This also ends the symbiotic relationship that helps the corals to survive and grow.
- Bleached corals can survive, depending on the levels of bleaching and the recovery of sea temperatures to normal levels.
- But, severe bleaching and prolonged stress in the external environment can lead to coral death.

Threats

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

Coral Diversity

- In the so-called true stony corals, which compose most tropical reefs, each polyp sits in a cup made of calcium carbonate.

- Stony corals are the most important reef builders, but organ pipe corals, precious red corals, and blue corals also have stony skeletons.
- There are also corals that use more flexible materials or tiny stiff rods to build their skeletons—the sea fans and sea rods, the rubbery soft corals, and the black corals.
- The fire corals (named for their strong sting) are anthozoans, which are divided into two main groups.
- The hexacorals have smooth tentacles, often in multiples of six, and the octocorals have eight tentacles, each of which has tiny branches running along the sides. All corals are in the phylum Cnidaria, the same as jellyfish.

Location of coral reefs:

- Coral reefs are mainly found in tropical seas (30°N to 30°S) where the sea is shallow (less than 100m); and warm (usually between 25° and 29°C).
- They are also found in cold waters (temperature as low as 4°C) at depths between 40m to 2000m.
- Unlike tropical corals, they don't need sunlight to survive and don't have zooxanthellae living in their polyps.
- They feed solely by capturing food particles from the surrounding water.
- Example: They are found off the coast of Norway's Røst Island,



In India, coral reefs are located in 7 regions:

- Goa coast
- Kerala coast
- Palk Bay,
- Gulf of Kutch
- Gulf of Mannar
- Lakshadweep islands
- Andaman and Nicobar islands



Question: What are the corals? Highlights the physical conditions for their growth and also show the their location in India.

THE GLOBAL SNOW LEOPARD ECOSYSTEM PROTECTION PROGRAM (GSLEP)

- Indian scientists receive international award on behalf of snow leopard conservation alliance.
- The Spain-based BBVA Foundation Awards for Biodiversity Conservation seek to recognise and support the work done by conservationist organisations, institutions and agencies in carrying forward environmental conservation policies and projects

The Global Snow Leopard Ecosystem Protection Program (GSLEP)

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

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