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Current Affairs

Contents

Ahmadiyya movement

Why in News

Unknown attackers broke the domes and minarets of a mosque of Pakistan's minority Ahmadiyya community in Karachi, Pakistan, recently.

Important Points

History of Ahmadiyya movement

- The origins of the religious sect are in Qadian near Amritsar in Punjab, India.
- They believe in the Messiah, Mirza Ghulam Ahmad (1835-1908) of Qadian.the name Ahmadiyya is a name shared by several Sufi (Muslim mystic) orders.
- Mirza Ghulam Ahmad founded the movement in 1889.
- He established the Community (or Jamāʿat) on 23 March 1889 by formally accepting allegiance from his supporters. Since his death, the Community has been led by a succession of Caliphs.
- In opposition to some aspects of Islam, he preached that he was the promised messiah who had the task of bringing God's teaching into harmony with the present-day world.
- He said his coming was awaited not only by Muslims but by Christians and Jews as well.
- He claimed to have been divinely appointed as both the Promised Mahdi (Guided One) and Messiah expected by Muslims to appear towards the end times and bring about, by peaceful means, the final triumph of Islam; as well as to embody, in this capacity, the expected eschatological figure of other major religious traditions.
- Ahmadi thought emphasizes the belief that Islam is the final dispensation for humanity as revealed to Muhammad and the necessity of restoring it to its true intent and pristine form, which had been lost through the centuries.
- Ahmadis thus view themselves as leading the propagation and renaissance of Islam.
- There are around 2-5 million Ahmadis in Pakistan. The community is also present in India, and some estimate their numbers at around 1 lakh.
- The sect has long been opposed by hardline Muslim clerics, some of whom consider Ahmadiyyas to be heretics.
- However, Ahmadiyyas do not dispute the centrality of the Prophet in their religion.

Visva-Bharati University will soon get the 'heritage' tag from UNESCO

Why in News

Visva-Bharati University will soon get the 'heritage' tag from UNESCO to take the distinction of world's first living heritage university.

Important Points

History of Visva-Bharati University

- Visva-Bharatiis a public central university and an Institution of National Importance located in Shantiniketan, West Bengal, India.
- It was founded by Rabindranath Tagore who called it Visva-Bharati, which means the communion of the world with India.

- When founded in 1921 on 1,130 acres of land, it was named after Nobel Laureate Rabindranath Tagore until Visva-Bharati Society was registered as an organisation in May 1922.
- Rabindranath donated some of his property, including land and a bungalow, to the society.
- Until Independence, it was a college and the institution was given the status of Central University in 1951 through a central Act.
- Its first vice-chancellor was Rathindranath Tagore, the son of Rabindranath Tagore, and the second vice-chancellor was grandfather of another Nobel Laureate economist Amartya Sen.
- Rabindranath believed in open-air education and introduced that system at the university, which prevails to date.

- In 1922, Visva-Bharati was inaugurated as a Centre for Culture with exploration into the arts, language, humanities, music and these are reflected in diverse institutes that continue in their educational programmes, which are based on the founding principles of excellence in culture and culture studies.
- As originally intended, these serve as institutes for Hindi studies (Hindi Bhavan), Sino-Asian studies (Cheena Bhavan), centre for humanities (Vidya Bhavan), institute of fine arts (Kala Bhavan), and music (Sangit Bhavan).
- The structures in these institutes constitute a myriad of architectural expressions which are as diverse as the Kalo Bari, a mud structure with coal tar finish and sculpture panels; Mastermoshai studio, a single storied structure built for the first principal of Kala Bhavan, Nandalal Bose; murals and paintings on Cheena and Hindi Bhavan, created by the illustrious artists like Benodebehari Mukhopadhyay, Nandalal Bose, Surendranath Kar, Somnath Hore with active involvement of students.
- The development comes 11 years after the Union Culture Ministry appealed for the second time to secure the status of UNESCO heritage site for Santiniketan [Visva Bharati] to get recognition for Tagore's cultural ark in the run-up to his 150th birth anniversary in 2010.
- The UNESCO seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity.
- This is embodied in an international treaty called the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted by UNESCO in 1972.

Stone carvings found in Gurugram

Why in News

Stone carvings that archaeologists say date back to the Paleolithic period or the Stone Age have been discovered in Gurugram, Haryana.

Important Points

- The findings include graffiti, and hand and footprints of humans and animals engraved on quartzite rocks.
- Most of the carvings are of animal paws and human footprints. There are some basic symbols, which had presumably been kept for some special purpose.
- These can be territorial, or used for ancient games or record-keeping
- The site is atop a hillock and just 6km from Mangar, where cave paintings believed to be from the same period were discovered in 2021.

- A team of archaeologists confirmed that the rocks indeed dated back to the Paleolithic period.
- The Paleolithic era spans from about 25 lakh years to 10,000 BP (before present, the carbon dating marker that archaeologists use with 1950 treated as the base year).
- These findings are remarkable examples of Indian prehistory. They mark the progress of human civilisation.

- Among the items that were found were pebbles and flake-based tools, hinting at a site where stone tools were manufactured — this 'Acheulean' industry was the first tradition of standardised tool-making.
- Archaeologists also believe that the stone paintings could be the largest in the Indian subcontinent.
- The Aravalis have been a subject of pre-historic research for several decades.
- In 1986, stone paintings were discovered in Anangpur area of Faridabad. A total of 43 sites were traced then, prompting researchers to start surveys of the area every now and then.

Vijayanagara-the Victory city

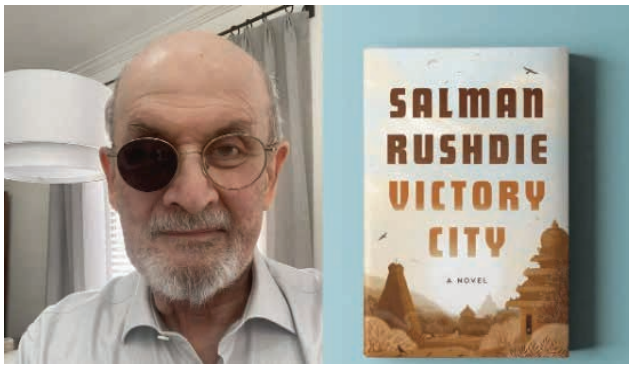
Why in News

Salman Rushdie is back with his latest novel, Victory City. The book is a fictionalised telling of the story of the Vijayanagara Kingdom, narrated by a sorceress and poet named Pampa Kampana.

Important Points

A brief history of Vijayanagara Kingdom

- The Vijayanagara kingdom has long been a subject of historical and political interest.
- From their capital, now known as Hampi, on the banks of the Tungabhadra river, the kings of Vijayanagara at the peak of their power ruled over a territory of more than 360,000 sq. km.
- Founded in 1336, the kingdom of Vijayanagara lasted for more than three centuries, a period in which it withstood multiple political stresses, and saw significant advances in art and economy.
- Over the course of its existence from 1336 to 1646, the kingdom saw various ups and downs.
- Founded by Harihara I of the Sangama dynasty, Vijayanagara expanded from a strategic position on the banks of the Tungabhadra river. By the 15th century, it had become a force to reckon with.
- The kingdom reached its peak under Krishna Deva Raya (reign 1509-1529), a period in which it enjoyed military superiority to its rival kingdoms such as the Bahmani Sultanate, the Golconda Sultanate and the Gajapatis of Odisha.
- At its peak, the kingdom stretched from Goa in the Konkan coast to parts of southern Odisha in the east and all the way to the very tip of the subcontinent in the south.
- While the economy of the kingdom was largely dependent on agriculture, trade thrived in its many ports on either coast.
- Traveller Abd al-Razzaq Samarqandi chronicled how "the ports of Mangalore, Honavar, Bhatkal, Barkur, Cochin, Cannanore, Machilipatnam, and Dharmadam saw traders from Africa, Arabia, Aden, the Red sea, China and Bengal and also served as ship building centres".
- The empire's principal exports were pepper, ginger, cinnamon, cardamom, myrobalan, tamarind timber, anafistula, precious and semi-precious stones, pearls, musk, ambergris, rhubarb, aloe, cotton cloth and porcelain.
- Razzaq also chronicled the high degree of monetisation in the Vijayanagara kingdom.
- In his classic History of South India, K A Nilakanta Sastri wrote that coins were minted by the state as well as by merchant guilds using gold, silver, copper and brass, and their value depended on material weight.



Contributions to culture and architecture

- This was a period when poetry and scholarship flourished, both in sacral and secular contexts.
- Literature in Tamil, Telugu, Kannada as well as Sanskrit was produced in the kingdom, with new writing styles and methods emerging.
- In architecture, Vijayanagara saw various enduring constructions.
- According to art historian Percy Brown, Vijayanagara architecture is "a vibrant combination and blossoming of the Chalukya, Hoysala, Pandya and Chola styles, idioms that prospered in previous centuries."
- The Prasanna Virupaksha temple of Bukka I and the Hazara Rama temple of Krishna Deva Raya are striking examples of Vijayanagara's characteristic style and intricate artistry.

- Vijayanagara's capital Hampi is a UNESCO World Heritage Site today, known for its sophisticated fortifications as well as innumerable temples and other architectural marvels.
- From accounts of foreign travellers, by the beginning of the 16th century, Hampi-Vijayanagara was probably the second largest urban settlement on the planet (after Beijing) and among the most prosperous.
- Historian Phillip B. Wagoner wrote that a lasting theme in Vijayanagara's historiography has been its characterisation as "a Hindu bulwark against Muhammadan conquests".
- From Robert Sewell's classic A Forgotten Empire (1900) to Nilakanta Sastri's 1955 magnum opus, this characterisation has persisted over the years and has been influential in the writing of the story of Vijayanagara.
- Vijayanagara has been remembered as an era of "cultural conservatism", when classical forms of Hinduism were preserved amidst growing Islamization of the rest of the subcontinent, especially the North.

Dhamaal

Why in News

Recently, a new documentary has focused on the music and dance performances of the Siddis community in Gujarat, called Dhamaals.

Important Points

About Dhamaals

- Dhamaal is a mix of Sufi and African (mostly East African) musical and dance traditions.
- It refers particularly to the spiritual practices of the Siddis of Gujarat.
- The Siddis begin almost every Dhamaal song by blowing into a conch shell. This is often followed by the slow playing of East African percussion instruments like the musindo and the slow thumping of feet that marks the onset of the singing and dancing Dhamaals.
- The ritual of foot thumping is a crucial part of spiritual East African dance and musical traditions.
- The Siddis are followers of Islam and arrived in India from Muslim communities in East and Central Africa.
- Dhamaals are performed in memory of their spiritual leaders, among them Bava Gor, Mai Misra, Baba Habash and Sidi Nabi Sultan.
- According to Siddi folklore they arrived from Ethiopia through the Nubian Valley, Syria and the Indian Ocean to the coast of Kuda in the Bhavnagar district of Gujarat.
- Usually, Dhamaal songs and dances are performed to celebrate the anniversary of the birth and death of spiritual leaders.

They are performed in two ways

Dance Dhamaal and Baithaaki Dhamaal.

- The Baithaaki Dhamaal is performed in the sitting position and the Dance Dhamaal is performed in both sitting and dance positions.
- During the performance of Baithaaki Dhamaal the focus is more on the lyrics and less on the musical instruments.
- During Dance Dhamaal the focus is more on the sounds of the instruments. These are often played in a frenzied manner and accompanied by frenzied dance movements.
- The spiritual songs that are sung during the Dhamaals are known as zikrs.
- The creole cultural aspects of Dhamaals are broadly reflected through the Swahili Creole language used to sing the zikrs, the Indian and African musical instruments used to perform them and the Afro -Indian body movements of Dance Dhamaals.
- Historically, the Swahili Creole language in India emerged among the Siddis through the mixing of Kiswahili from East Africa with Gujarati, Hindi and Urdu languages from India.

- Zikr is sung in the praise of Siddi spiritual leader Nabi Sultan, believed to have arrived in Gujarat from the Nubian Valley.
- The Swahili words that have been used are "hu" (a common expression of consent) and "sabaya" (meaning that everything is alright).
- The zikr means that with the blessings of Nabi Sultan no evil can befall the Siddis of Gujarat.
- The musical instruments used to perform the zikrs are East African percussion instruments. They are:
  - The musindo, for example, is a cylinder-shaped, two-sided drum from Kenya.
  - The misr kanga is a small, funnel-shaped instrument from Ethiopia, containing small stones.
  - The mugarman is a large, cylinder-shaped, one-sided drum from Tanzania.
- These are played along with traditional Indian musical instruments. These include the harmonium (a keyboard instrument) and the dholak (a two-headed hand drum).
- The intermingling of Indian and African musical instruments generates creole rhythmscapes which are traditionally African and Indian at the same time.
- During the Dance Dhamaal, the hand and the body movements of the Dhamaal dancers in Gujarat are very similar to the Ngoma dancers of East Africa.
- The Ngoma dancers thump their feet and swing their arms sideways to the rhythm of drums. The Dhamaal dancers also swing their arms sideways, but the thumping of feet depends on the context of their dance.
- During religious occasions, for example, the foot thumping is slow. This is because the Siddis follow many spiritual aspects of the Sufi tradition.
- For Sufis, heavy and frenzied feet thumping is prohibited when worshipping spiritual leaders.

About Siddi Tribe

- The Siddi also known as Sidi, Siddhi, Sheedi or Habshi.
- Sometimes referred to as Afro-Indians.
- They are descended from the Bantu peoples of the East African region.
- It is believed that they are of African origin because they clearly show the Negroid racial strain in their physical features.
- Another term for Siddis, habshi, is held to be derived from the common name for the captains of the Abyssinian ships that also first delivered Siddi slaves to the subcontinent.
- They are primarily Muslims, although some are Hindus and others belong to the Catholic Church.

Aljamea-tus-Saifiyah of Dawoodi Bohra community

Why in News

The Prime Minister Narendra Modi inaugurated the campus of the Aljamea-tus-Saifiyah , an Arabic academy of the community recently.

Important Points

About the campus-

- Also known as Jamea, this is an academic institute exclusively catering to the education of young boys and girls from the Dawoodi Bohra community, a Shiite denomination spread across the world.
- While the academy's focus will primarily be on spiritual and religious studies, the academy will also provide its students with mainstream education in association with an internationally recognised school board curriculum.
- The Mumbai campus is spread around 850,000 sq ft in Andheri's Marol and is the second such campus in India.
- The first one was established over two centuries ago in 1810 in Surat, a town which is the home to a large Bohra population.
- The new campus boasts of magnificent white marble structures, with colourful designs engraved in different colours.
- It has huge corridors, ceremonial halls decorated with beautiful chandeliers, and a multilevel landscaped courtyard housing a minaret surrounded by a series of fountains and water bodies indicating flow of knowledge.

- The Mumbai campus also has separate hostels for boys and girls, faculty residences, a multi-storey administration and classroom building, a library, dining halls, prayer halls and a building dedicated to teaching of Holy Quran.
- The prayer area is inspired by the al-Jāmiʿ al-Azhar in Cairo, the original location of the Al Azhar University, one of the oldest extant universities in the world.
- Globally this will be the fourth campus of the Jamea after Surat (1810), Karachi (1983) and Nairobi (2017).

The Dawoodi Bohra community

- The Dawoodi Bohras are Shia Muslims whose leader is known as the Al-Dai-Al-Mutlaq. A
- According to members of the community, there are around 1 million Dawoodi Bohras spread around the world.
- Their largest numbers reside in India, Pakistan, Yemen, East Africa, and the Middle East, with a growing presence across Europe, North America, South East Asia, and Australia.
- They are known to be a close-knit community who, like all Muslims, follow the tenets of Islam; namely reciting the Quran, observing the five daily prayers, fasting during the month of Ramadan, performing the pilgrimages of Hajj and Umrah and offering Zakat.
- Whilst adherence to traditional values is important for the community, they are also known for their mercantilism and having a modernist approach to their lifestyles.
- The cultural heritage of this denomination is found in the traditions of the Fatimid Imams; direct descendants of the Islamic prophet Muhammad through his daughter Fatima.
- The Fatimids ruled over North Africa between 10th and 11th century CE.
- Mostly self-reliant, the Bohras are typically traders, businesspersons, and entrepreneurs. The word "Bohra", in fact, comes from the Gujarati word vohrvu or vyavahar, meaning "to trade".
- For over 400 years, the leader of the community has been based in India, including the current and the 53rd leader, His Holiness Dr Syedna Mufaddal Saifuddin.
- The leader of the community is recognised by the members as having the right to excommunicate its members.
- In practical terms, excommunication means not being allowed to access a mosque belonging to the community or a burial dedicated to the community.
- Among the members of the community who have faced excommunication in the past are those who contested the headship of the leaders.

Sangam age pushed to 800 BCE

Why in News

In the latest development, the Sangam age has been pushed to 800 BCE based on the archaeological findings in Keladi along the Vaigai river, about 13 km from Madurai.

Important Points

- K. Amarnath Ramakrishna, who discovered Keeladi and led the first two seasons of excavations between 2014 and 2016, submitted his 982-page report to ASI Director General V. Vidyavathi recently.
- Based on the results of stratigraphy of the cultural deposits found in the first two phases, the period of the Sangam era archaeological site has been placed between 8th century BCE to 3rd century CE.
- Sangam age was believed to be between 300 BCE to 300 CE. The new report repositions the Sangam age between 800 BCE and 300 CE.
- Even this period of history has been classified into three periods.
- The pre-early historic period between 800 BCE to 500 BCE.
- Mature early history between 500 BCE to the end of 1st century BCE and
- Post early history from 1st century BCE to 300 CE.

- According to the report, the fertile nature of the area and cattle rearing played a crucial role in its evolution paving the way for excess production of rice and sea trading of the inhabitants.
- About 5,800 artefacts were unearthed at Keeladi during the first two phases of excavation.
- In 2017, the Tamil Nadu State Department of Archaeology took over the excavations and thousands of artefacts continue to be unearthed at the site confirming the rich urban life of the ancient Tamils.
- In 2019, the Tamil Nadu State Department of Archaeology(TNSDA), in a report, stated that the cultural deposits unearthed during (fourth phase) excavations could be safely dated to a period between 6th century BCE and 1st century BCE. .
- The findings in the TNSDA report placed Keeladi artefacts about 300 years earlier than previously believed – 3rd century BCE.
- Now, the ASI report, which studied only 2% of the site, has further pushed the Sangam age to 800 BCE.

The Sangam age

- The Sangam period or age, particularly referring to the third Sangam period, is the period of the history of ancient Tamil Nadu, Kerala and parts of Sri Lanka dating back to c. 3rd century CE.
- It was named after the mythical and legendary Sangam academies of poets and scholars centered in the city of Madurai.
- In Old Tamil language, the term Tamilakam referred to the whole of the ancient Tamil-speaking area,corresponding roughly to the area known as southern India today, consisting of the territories of the present-day Indian states of Tamil Nadu, Kerala, parts of Andhra Pradesh, parts of Karnataka and northern Sri Lanka also known as Eelam.
- According to Tamil legends, there were three Sangam periods, namely Head Sangam, Middle Sangam and Last Sangam period.
- Historians use the term Sangam period to refer to the last of these, with the first two being legendary.
- The Sangam literature is thought to have been produced in three Sangam academies of each period. The evidence on the early history of the Tamil kingdoms consists of the epigraphs of the region, the Sangam literature, and archaeological data.
- Between 600 BCE to 300 CE, Tamilakam was ruled by the three Tamil dynasties of Pandya, Chola and Chera, and a few independent chieftains, the Velir.

200th birth anniversary of Dayanand Saraswati

Why in News

Prime Minister of India paid tribute to Dayanand Saraswati on the 200th birth anniversary.

Important Points

Dayanand Saraswati

- Dayanand Saraswati (1824-1883) was one of the most influential figures of 19th-century India.
- A believer in the supreme authority of the vedas, he established the Arya Samaj in 1875, leading a reform movement within orthodox Hinduism.
- Among his various beliefs included a rejection of idolatry and the overly ritualistic traditions of Hinduism, support for women's education, denunciation of child marriage and an opposition to untouchability.
- His magnum opus, Satyarth Prakash (1875), emphasised the "return to Vedic principles" that Dayanand Saraswati believed "had been lost" over time.
- The book uses the language of religious revivalism – hearkening back to a 'better' ancient past – in order to fashion a modern religious philosophy and organisation, capable of competing against the increasingly proselytising Christian missionaries.

- From the 18th century, as the British got ever so entrenched in India, they brought with them missionaries to spread the Christian faith.
- As part of the West's "civilising mission", missionaries provided an ideological justification for what was an exploitative imperial project.
- Furthermore, through their growing influence, they also created a degree of subservience to the Empire, especially in certain sections of the population.
- A reason for the success of Christian missionaries in the Indian subcontinent was the nature of native culture and belief systems at the time.
- As Dayanand Saraswati himself put it, over the centuries, Hindus had moved away from the teachings and traditions of the Vedas, which were the source of the "ultimate truth" in the world.
- This departure from the true Sanatan Dharma (what he referred Vedic religion as) resulted in practices such as idolatry, untouchability, sectarianism, sati, primacy of the priestly class, etc. becoming commonplace.
- For missionaries, these so-called 'regressive practices' provided not only the reason for their "civilising" mission, but also an audience for their message among populations worst treated within the traditional Hindu fold.
- By preaching the supremacy of the Vedas, Dayanand Saraswati harkened to a "better time" where true Sanatan Dharma was prevalent.
- While his teachings were very much in tune with the prevailing social conditions of his day, his message was formulated in the language of revivalism rather than progressive reform.
- This only added to his influence, especially among more conservative sections of society.
- A major part of his mission was to address the fragmented nature of Hindu society. According to Dayanand Saraswati, the brahmans were primarily to blame for this – they had corrupted the Sanatan Dharma in order to maintain and grow their own status and influence in society.
- By depriving the laity of Vedic knowledge, they were successful in warping Hindu religion into something it was not, without the kind of theological backlash that they should have received.
- To propagate his message, he toured across India, debating with pandits and religious scholars. He was extremely eloquent and would defeat even the most erudite of Hindu scholars with his sheer oratorical prowess.
- During his tours, he began to gather a following. Thus, he founded the Arya Samaj in 1875. This was a monotheistic Hindu order that rejected the ritualistic excesses and social dogmas of orthodox Hinduism and promoted a united Hindu society on the basis of Vedic teachings.
- Even before the establishment of the Arya Samaj, Dayanand Saraswati had founded multiple Vedic schools.
- Modelled on missionary schools that were increasingly popular among Indians, these Gurukuls provided an Indian alternative, based on principles of the Vedas. For Dayanand Saraswati, this was crucial to break the monopoly of brahmans on Vedic knowledge.
- Dayanand Saraswati died under suspicious circumstances in 1883, after his public criticism of the Maharaja of Jodhpur.

Dayanand's philosophy & legacy

- Dayanand Saraswati preached respect and reverence for other human beings, supported by the Vedic notion of the divine nature of the individual.
- Crucial among his "ten founding principles of Arya Samaj" is the idea that all activities must be done for the benefit of humankind as a whole, rather than individuals or even idols and religious symbols.
- This universalism was directly antithetical to the caste system. While Dayanand did not fully oppose the institution of caste itself, he advocated for significant reform within it.
- Citing the Vedas, he claimed that caste is not supposed to be hereditary but rather on the basis of an individual's talents and disposition.
- Furthermore, he was against the practice of untouchability, which he believed was an outcome of centuries of brahmanical domination. Crucially, he advocated Vedic education for all castes.

- His views on women were also against the grain of orthodox Hindu thinking at the time. He campaigned for the education of women as well as against 'regressive practices' such as child marriage.
- Dayanand Saraswati's legacy has had an enduring influence. First, his message was particularly important at a time when nationalist sentiment in India was rising.
- He is credited to have first used the term swaraj (self-rule) in 1875, which would later be picked up by the likes of Lokmanya Tilak and Mahatma Gandhi.
- His criticism of the British from a religious point of view (chapter 13 of Satyarth Prakash is completely dedicated to his criticism of Christianity) as well as providing an ancient Indian alternative was crucial to the nationalist discourse of the time.
- Second, his work was also important for the consolidation of Hindus.
- Through the organisation of Arya Samaj, he was among the first to advocate 'conversion' into the Hindu fold – he supported the idea of shuddhi, to bring back Islamic or Christian converts into Hinduism.

- This became a very popular movement by the early 20th century, especially aimed at lower caste converts who were given a higher social status and self-esteem under the more egalitarian Arya Samaji philosophy.
- Today, Dayanand Saraswati's legacy carries on through the Arya Samaj centres found across India as well as the Dayanand Anglo-Vedic schools and colleges.
- Providing quality education even in the most remote places, DAV schools have over time become popular.
- Sarvapalli Radhakrishnan, India's second President and an influential educationist, called Dayanand Saraswati "a maker of modern India".

Saint Valentine

Why in News

Saint Valentine's is known for being associated with the Valentine's Day, its origins also have a darker side.

Important Points

Saint Valentine

- Saint Valentine is believed to be a third-century Roman Catholic priest, who died on February 14 in 270 AD.
- It is said that he defied emperors' orders and secretly married couples.
- Soldiers were not allowed to get married because the emperor thought single men were more devoted fighters. Valentine disagreed with the idea. For this defiance, he was beheaded by Emperor Claudius II Gothicus.
- But this is not the only theory and another reference to weddings is found.
- Allegedly, it was an attempt by the Church to spread its influence over Lupercalia, an ancient Roman festival held around the same time.
- The Roman celebration honoured Faunus, the god of agriculture, as well as Romulus and Remus, the Roman founders.
- Men would pick names of women from a box, and they would become a couple through the event.

- However, Pope Gelasius picked the period of Lupercalia celebrations as the day to remember Saint Valentine towards the end of the 5th century, resulting in the association of Valentine's Day with love and romance.

How did Valentine's Day become a global celebration?

- Valentine, who died in 270 AD, was canonised by the Roman Catholic Church, as he may have also served as a priest who helped Christian couples get married in secret. And the legend grew.
- Through the works of Geoffrey Chaucer and William Shakespeare, the concept was romanticised and popularised in Europe and the English-speaking world.
- According to the British Library, the idea that Valentine's Day is a day for lovers is thought to originate with Chaucer's Parliament of Fowls, a poem written in the late 14th century.
- The poem describes a group of birds which gather together in the early spring – on 'seynt valentynes day' – to choose their mates for the year. It seems that the poem sparked a tradition.
- In 'A Midsummer Night's Dream', Shakespeare makes a reference to Valentine's Day.
- There is also the reason behind why Cupid, another popular icon, is represented as a child – a break from earlier representations of the Roman god of desire.[1]

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Chapter-
2

POLITY & GOVERNANCE

Puisne judges

Why in News

While recommending two names for appointment as judges of the Supreme Court, the Collegium headed by Chief Justice of India D Y Chandrachud mentioned about senior puisne Judges.

Important Points

What does puisne mean, and who are puisne judges?

- According to the dictionary, the word puisne has French origins, which means "later born" or younger. It is pronounced /'pju:ni/, like "puny", the English word that means small or undersized.
- Puisne is almost always used in the context of judges, and essentially denotes seniority of rank. The term puisne judge is used in common law countries to refer to judges who are ranked lower in seniority, i.e., any judge other than the Chief Justice of that court.
- Common law is the body of law that is created by judges through their written opinions, rather than through statutes or constitutions (statutory law). Common law, which is used interchangeably with 'case law', is based on judicial precedent. The United Kingdom (UK) and the Commonwealth countries, including India, are common law countries.

Difference of "puisne judge" in India & the UK-

- In the UK, puisne judges are judges other than those holding distinct titles.
- The Supreme Court of Judicature Act, 1877 defined a "puisne judge" as any judge of the High Court besides the Lord Chancellor, the Lord Chief Justice of England, and the Master of the Rolls.
- In India, all judges have the same judicial powers. As the seniormost judge of a court, the Chief Justice has an additional administrative role.
- In India, there is a reference to a puisne judge only while considering the order of seniority for appointments, elevations to High Courts, etc., but it does not have a bearing on the exercise of a judge's judicial power.

What did the collegium say about puisne judges?

- The Supreme Court collegium recommended Justice Rajesh Bindal and Justice Aravind Kumar, the current Chief Justices of the Allahabad and Gujarat High Courts respectively, for appointment as judges of the Supreme Court.
- While giving reasons for its recommendation, the collegium said that the decision was made taking "into consideration the seniority of Chief Justices and senior puisne Judges in their respective parent High Courts as well as the overall seniority of the High Court Judges".
- This was done because seniority is one of the several criteria that are considered while making appointments to the higher judiciary.
- In the Third Judges Case ruling in 1998, one of the two cases that led to the evolution of the collegium system, the Supreme Court clarified that "The Chief Justice of India must make a recommendation to appoint a Judge of the Supreme Court and to transfer a Chief Justice or puisne Judge of a High Court in consultation with the four seniormost puisne Judges of the Supreme Court."

Parliament is North Star of Democracy

Why in News

Vice President Jagdeep Dhankhar has recently said that Parliament is the "North Star" of democracy.

Important Points

- The Vice President has said that Parliament is the essence of democracy. Parliament is the North Star of democracy. It is a place of discussion and deliberation to realise the aspirations and dreams of the people and not a place of disturbance.
- Interestingly, Chief Justice D Y Chandrachud had called the basic structure doctrine a "North Star", that gives "certain direction to the interpreters and implementers of the Constitution when the path ahead is convoluted.
- Here, both VP Dhankar and CJI Chandrachud have used the metaphor of the North Star to refer to something constant/permanent that leads and provides direction.
- When VP Dhankar says that the "parliament is the North Star of democracy", he means that it is the institution that guides democratic functioning, that dictates the direction a democracy takes.
- Since it represents the 'will of the people', many political thinkers have always felt that as an institution, the parliament is the most fundamental in a democracy.
- On the other hand, CJI Chandrachud comes at the issue from a certain wariness towards majoritarianism and the injustice that can be carried out in the name of the 'people'.
- For him, it is the basic structure doctrine that prevents this from happening.

What is the North Star or Pole star?

- Polaris, known as the North Star or Pole Star, is a very bright star — around 2,500 times more luminous than the Sun. It is part of the constellation Ursa Minor, and is around 323 light years away from the Earth.
- Since Polaris is less than 1° away from the north celestial pole, almost in direct line with the Earth's rotational axis, it appears to sit motionless in the northern sky, with all the other stars appearing to rotate around it.
- Its position and brightness have allowed humans to use it for navigation since late antiquity.
- Simply the elevation of the star above the horizon gives the approximate latitude of the observer.
- In the northern hemisphere, if you can spot Polaris, you can tell the north — and by extension, the other three directions as well.
- Upon crossing the equator to the south, however, the North Star is lost over the horizon, and hence stops being a useful navigational aid.
- Polaris seems to have been first charted by the Roman mathematician and astronomer Ptolemy, who lived from about 85 to 165 BC.
- While there is some evidence that the star was used for navigation in late antiquity, it was during the 'Age of Exploration' that it became a central part of human history.
- Christopher Columbus, on his first trans-Atlantic voyage of 1492, "had to correct (his ship's bearings) for the circle described by the pole star about the pole", and the star became an invaluable aid to the European colonists seeking out far-off lands across the seas.
- The first well known instance of the North Star appearing in literature outside of a technical treatise on astronomy or a biography of an explorer is in Shakespeare's Julius Caesar, where the eponymous emperor describes himself as being "as constant as the Northern Star".

How does the North Star help in navigation?

- Its position and brightness have made humans use it for navigation since late antiquity. It is a part of the constellation Ursa Minor and is around 323 light-years away from Earth.
- Since Polaris lies nearly in a direct line with the Earth's rotational axis "above" the North Pole, it stands almost motionless in the night sky, with all the stars of the northern sky appearing to rotate around it.
- This makes it an excellent fixed point from which to draw measurements for celestial navigation.
- Simply the elevation of the star above the horizon gives the approximate latitude of the observer and in the northern hemisphere, if you can see Polaris you can always tell which way is north (and, by extension, which ways are south, east and west).
- Upon crossing the equator to the South, the North Star is lost over the horizon and hence stops being a useful navigational aid.

73rd anniversary of Supreme Court of India

Why in News

The Supreme Court of India has recently observed the 73rd anniversary of its establishment.

Important Points

History of the Supreme Court

- On the January 28, 1950, two days after India became a sovereign democratic republic, the Supreme Court of India came into being.
- The inauguration took place in the Chamber of Princes in the Parliament building which was the home to the Federal Court of India for 12 years preceding the Supreme Court's establishment.
- The Federal Court of India was a judicial body, established in India in 1937 under the provisions of the Government of India Act 1935, with original, appellate and advisory jurisdiction.
- It functioned until the Supreme Court of India was established in 1950.
- The Parliament House was to be the home of the Supreme Court for years that were to follow until the court acquired its own present building with lofty domes and its signature spacious colonnaded verandas in 1958.
- The inaugural proceedings on the 28th began at 9.45 a.m. when the Judges of the Federal Court – Chief Justice Harilal J.Kania and Justices Saiyid Fazl Ali, M. Patanjali Sastri, Mehr Chand Mahajan, Bijan Kumar Mukherjea and S.R.Das took their seats.
- In attendance were the Chief Justices of the High Courts of Allahabad, Bombay, Madras, Orissa, Assam, Nagpur, Punjab, Saurashtra, Patiala and the East Punjab States Union, Mysore, Hyderabad, Madhya Bharat, and Travancore-Cochin.
- Along with the Attorney General for India, M.C. Setalvad were present the Advocate Generals of Bombay, Madras, Uttar Pradesh, Bihar, East Punjab, Orissa, Mysore, Hyderabad, and Madhya Bharat.
- Present too, were the Prime Minister, other Ministers, Ambassadors and diplomatic representatives of foreign States, a large number of senior and other advocates of the Court, and other distinguished visitors.
- The inaugural proceedings ensured that the rules of the court were published and the names of all the advocates and agents of the Federal Court were brought on the rolls of the Supreme Court.

- In 1958, when the court shifted its premises, the building was shaped to project the image of scales of justice, in the central wing.
- In 1979, two new wings – the East wing and the West wing – were added to the complex.
- In all, there are 19 Courtrooms in the various wings of the building. The Chief Justice's Court is the largest of the Courts located at the Centre of the Central Wing.
- The original Constitution of 1950 envisaged a Supreme Court with a Chief Justice and 7 puisne judges – leaving it to Parliament to increase this number.
- In the early years, all the judges of the Supreme Court sat together to hear the cases presented before them.
- As the work of the Court increased and arrears of cases began to accumulate, Parliament increased the number of Judges from 8 in 1950 to 11 in 1956, 14 in 1960, 18 in 1978, 26 in 1986, 31 in 2009, and 34 in 2019 (current strength).
- As the number of Judges has increased, they sit in smaller benches of two and three coming together in larger benches of 5 and more only when required to do so or to settle a difference of opinion or controversy.
- 2023 event was aired on social media platforms and saw Singapore's Chief Justice Sundaresh Menon, who is of Indian origin, as the chief guest.

State police chiefs

Why in News

Recently, the Supreme Court had directed the Nagaland government to appoint the 1992-batch IPS officer as police chief. The order was passed after Nagaland challenged the UPSC's recommendation.

Important Points

Process of appointing state police chief

- Appointments of Director general of police (DGPs) are now made on the basis of the Supreme Court judgement on police reforms in Prakash Singh vs Union of India in 2006.
- Based on the judgement, the UPSC issued its own guidelines in 2009 on the appointment of police chiefs of states.
- According to these guidelines, states are supposed to draw up and send to the UPSC a list of eligible officers with at least 30 years of service behind them, along with these officers' service record, performance appraisal, and vigilance clearance.
- These officers are to be of the rank of ADG or the rank of police chief (and one below) stipulated for that state. The list is supposed to be given to UPSC six months before the incumbent DGP is to retire.
- An empanelment committee headed by the UPSC chairman, and with the union home secretary, state chief secretary, state DGP, and the chief of a central police organisation in it, is supposed to select a panel of three officers "based on merit".
- For smaller states that may have only one cadre post of DGP, the committee is supposed to send two names.
- Under the rules, consent of an officer is not required for her posting. Also, the Centre has the power to not relieve an officer for posting in the state.
- UPSC also submitted that while the 30-year rule could be relaxed to 25 years in states like Himachal Pradesh, Manipur, Nagaland, Uttarakhand, Tripura, and Sikkim which may not have enough officers meeting this criterion, this is to be done with the consent of the Centre.

- Through two orders passed in 2018 and 2019, the SC has also stipulated that the UPSC shall not put in the panel any officer with less than six months to retirement.

Rules on expunging from the record of Parliament

Why in News

Recently, some portions of Congress leader Rahul Gandhi's speech delivered in Lok Sabha have been expunged or removed from the records of Parliament by the orders of the Speaker.

Important Points

The rules on expunging from the record-

- The expunging of certain words, sentences, or portions of a speech from the records is a fairly routine procedure, and is carried out in accordance with laid down rules.
- The decision on which parts of the proceedings are to be expunged lies with the Presiding Officer of the House.
- Under Article 105(2) of the Constitution, "no Member of Parliament shall be liable to any proceedings in any court in respect of anything said…in Parliament or any committee thereof". However, MPs don't enjoy the freedom to say whatever they want inside the House.
- The speech of MPs is subject to the discipline of the Rules of Parliament, "good sense" of its Members, and the control of proceedings by the Speaker.
- These checks ensure that MPs cannot use "defamatory or indecent or undignified or unparliamentary words" inside the House.
- Rule 380 ("Expunction") of the Rules of Procedure and Conduct of Business in Lok Sabha says: "If the Speaker is of opinion that words have been used in debate which are defamatory or indecent or unparliamentary or undignified, the Speaker may, while exercising discretion order that such words be expunged from the proceedings of the House."

- Rule 381 says: "The portion of the proceedings of the House so expunged shall be marked by asterisks and an explanatory footnote shall be inserted in the proceedings as follows: 'Expunged as ordered by the Chair'."

What are "unparliamentary" expressions?

- Over the years, a huge number of words, both in English and other Indian languages, have been found to be "unparliamentary" by the Presiding Officers — the Speaker of Lok Sabha and Chairperson of Rajya Sabha. These unparliamentary expressions are kept out of Parliament's records.
- The Lok Sabha Secretariat has brought out a bulky volume of 'Unparliamentary Expressions'.
- This book contains words or expressions that would likely be considered rude or offensive in most cultures. But it also contains content that would appear to be fairly harmless and innocuous.
- At the time [the book was first compiled], references were taken from debates and phrases (that had been) declared unparliamentary by the pre-Independence Central Legislative Assembly, Constituent Assembly of India, the Provisional Parliament, the first to the tenth Lok Sabha and Rajya Sabha, state legislatures, and Commonwealth parliaments like that of the United Kingdom.
- State legislatures too are guided mainly by the same book of unparliamentary expressions.
- Depending upon rulings of the Presiding Officers, new words and phrases continue to be added to the list at regular intervals.

How is the decision to expunge a word (or portion of a speech) taken?

- If a member uses a word that could be unparliamentary or indecent and hurts the decorum or dignity of the House, the head of the reporting section sends it to the Speaker or the Presiding Officer citing relevant rules and precedence with a recommendation to expunge them.
- The Speaker has the discretion under Rule 380 to expunge the word or usage. Once the Speaker expunges the word or usage, it comes back to the reporting section which removes the word from the records and mentions in the proceedings as expunged as ordered by the chair.
- At the end of the session, a compilation of words removed from the records, along with reasons, is sent to the Speaker's office, Sansad TV, and the editorial service for information.
- The context in which a word or sentence is used is key to making the decision on whether to expunge.
- For example the word "Godse", which was expunged first in 1958 after a member equated Prime Minister Jawaharlal Nehru to Nathuram Godse, and then again in 1962 after another member equated Godse to Swami Vivekananda, but was taken off the list of unparliamentary words by Speaker Sumitra Mahajan in 2015.

What happens after a word has been expunged?

- Expunged portions of the proceedings cease to exist in the records of Parliament, and they can no longer be reported by media houses, even though they may have been heard during the live telecast of the proceedings.
- However, the proliferation of social media has introduced challenges in the watertight implementation of expunction orders.
- Once the live broadcast (of proceedings) started, whenever such (unparliamentary) words were spoken, they were removed, instead of being replaced; and on the audio files, such words were replaced with a beep.

Uttarakhand's new anti-cheating law

Why in News

Recently, the Uttarakhand Governor gave his assent to the Uttarakhand Competitive Examination (Measures For Control and Prevention of Unfair Means in Recruitment) Ordinance, 2023, brought by the state government to prevent the use of unfair means in exams.

Important Points

- The ordinance said that the main aim behind the law was to prevent offences related to obstructing the sanctity of examinations, use of unfair means, leakage of question papers, and other irregularities.
- It covers public examinations for recruitment to posts under the state government, autonomous bodies run by the government, and authorities, corporations, and institutions operated with grants of the state government.

- According to the ordinance, if any examinee is caught cheating or causing another examinee to cheat in a competitive examination (online and offline) or to have indulged in unfair means, he shall be punishable with imprisonment for three years and with a minimum fine of Rs 5 lakh.
- If the fine is not paid, the examinee shall be jailed for another nine months.
- A second-time offender will be punishable with a minimum jail term of 10 years and fine of Rs 10 lakh. In default of payment of fine, he will be jailed for another 30 months.
- If any person, printing press, service provider contracted or ordered for examination, management for conducting an examination, or any person and organisation authorised to keep and transport the examination material, any employee of the examination authority, limited liability partnership, coaching centre or any other institution has indulged in conspiracy or other unfair means, they shall be punished with a jail term of not less than 10 years, which may extend to life imprisonment.
- They will also be punished with a minimum fine of Rs 1 crore, which can go up to Rs 10 crore. If they can't pay the fine, the convicts will serve another jail term of three years.
- Also, an applicant found cheating will be debarred for two to five years from the date of the chargesheet, and in case of conviction, from all competitive exams for 10 years.
- All the properties earned using unfair means will be seized. The offences are cognizable, non-bailable and non-compoundable.

UP's anti-cheating law of 1992

- In the late 1980s and early 90s, public examinations in Uttar Pradesh (from which Uttarakhand was carved out in 2000) frequently witnessed allegations of cheating, involving officials, teachers, students and even local gangsters.
- In 1991, then Uttar Pradesh Chief Minister Kalyan Singh appointed Rajnath Singh as the education minister.
- Both leaders planned to establish a system to curb cheating. Next year, in 1992, the Kalyan Singh government promulgated a stringent anti-cheating Act.
- The law aimed to end the practice of mass copying in school and university examinations, and contained a provision that any student found copying would be handcuffed and sent to jail.
- The Act made the use of unfair means in exams a non-bailable cognizable offence and allowed the police to enter examination centres to conduct checks and arrest the offenders.
- During the UP-Board examinations of 1992, newspapers in the state published pictures of handcuffed students caught cheating in the exams, causing an uproar.
- Due to the strict implementation of the law, around 17 per cent of the students left the examination midway. As a result, only 14.70 per cent of intermediate and 30.30 per cent of high school candidates passed the board exams.
- In the 1993 elections, the SP came to power in alliance with the Bahujan Samaj Party, and scrapped the anti-copying ordinance within hours of taking oath.
- The government also implemented the 'self-centre' rule, allowing schools and colleges to become examination centres for their own students.
- In 1997, with the return of the BJP and Kalyan Singh as the CM, the government reintroduced the Anti-Copying Act, but with the change that the offence was made bailable.

Draft Geo-heritage Sites and Geo-relics (Preservation and Maintenance) Bill

Why in News

Ministry of Mines has recently notified the draft Geo-heritage Sites and Geo-relics (Preservation and Maintenance) Bill.

Important Points

- The Bill is aimed at providing for the declaration, preservation, protection and maintenance of geo-heritage sites and geo-relics of national importance, for geological studies, education, research and awareness purposes.

- The Bill states that despite identifying these sites, there are concerns over their preservation.
- Due to the absence of any legislation in the country for the protection, preservation and maintenance of the geoheritage sites, these are increasingly threatened with destruction not only by the natural causes of decay but also by population pressure and changing social and economic conditions which is aggravating the situation.
- It states that the fossil wealth of dinosaur remains of Madhya Pradesh and Gujarat, marine fossils of Kutch and Spiti…oldest life forms viz. stromatolites of Rajasthan and Madhya Pradesh…are of great geoheritage and geotourism value.
- The world's oldest metallurgical records of gold, lead and zinc in Rajasthan and Andhra Pradesh are still preserved but are under great threat.
- It points to how the GSI has the authority to acquire any material of geological significance, including sediments, rocks, minerals, meteorites, and fossils, as well as sites of geological importance.
- It would authorise the Central Government to declare a geoheritage site to be of national importance.
- This would be under the provisions of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013(RFCTLARR Act).
- Through a public notification in the Official Gazette, the government would spell out what areas were to be acquired by it, and objections to this can be raised within two months.
- Provision is made for compensation to the owner or occupier of land who incurs loss or damage from the land due to the exercise of any power under this Act.
- The market value of any property will be ascertained in accordance with the principles set out in the RFCTLARR Act.
- The Bill imposes a prohibition on construction, reconstruction, repair or renovation of any building within the geoheritage site area or utilisation of such area in any other manner, except for construction for preservation and maintenance of geoheritage site or any public work essential to the public.
- Penalties for destruction, removal, defacement or contravention of any direction issued by the Director General, GSI in the geo-heritage site are mentioned.
- There is a penalty of imprisonment which may extend to six months or fine which may extend to Rs.5 lakh, or both.
- In the case of a continuing contravention, additional fine of upto Rs.50,000 for every day of continuing contravention may be imposed.

What are the Geo-heritage Sites and Geo-relics?

- The draft bill defines Geoheritage sites as "sites containing geo-relics and phenomena, stratigraphic type sections, geological structures and geomorphic landforms including caves, natural rock-sculptures of national and international interest; and includes such portion of land adjoining the site," that may be required for their conservation or to access to such sites.
- A Geo-relic is defined as "any relic or material of a geological significance or interest like sediments, rocks, minerals, meteorite or fossils". The GSI will have the power to acquire geo-relics "for its preservation and maintenance".
- According to a 2016 press release by the Ministry of Mines, the Geological Survey of India (GSI) declares geo-heritage sites/ national geological monuments for protection and maintenance. The GSI or the respective state governments take necessary measures to protect these sites.
- Coming under the Ministry of Mines, the GSI was established in 1851 to investigate and assess coal and other mineral resources of the country through regional-level exploration.
- The 32 geo-heritage sites spread across 13 states include the Volcanogenic bedded Barytes of Mangampeta in Cuddapah district of Andhra Pradesh, the Akal Fossil Wood Park in Jaisalmer, Rajasthan and others.

The Supreme Court of India transcribes its proceedings live using AI

Why in News

The Supreme Court of India recently started a first-of-its-kind project to transcribe its proceedings live using Artificial Intelligence (AI).

Important Points

How does the AI powered transcription work?

- The SC transcription is using Teres, which is a platform used often for transcribing arbitration proceedings.
- The platform is run by Nomology Technology Private Limited, a Bengaluru based company.
- The transcript will also be shared with lawyers who argued cases for verification, and is likely to be uploaded on the SC website every evening.
- The transcribing is the second major decision towards making the court more transparent after the SC's decision to livestream its proceedings before Constitution Benches.
- The suggestion to transcribe hearings was made by senior advocate Indira Jaising in the plea she had filed seeking live telecast of court proceedings.
- Jaising, who was one of the petitioners in the matter that led to the 2018 Supreme Court verdict that declared the live telecast of court proceedings part of the right to access justice under Article 21 of the Constitution.

Availability of transcripts for courts in other countries

- In the US, court transcripts are available to litigants and the public. The US Supreme Court provides audio and text transcripts of the proceedings.
- Many local courts in the US also make a stenographic record of most court proceedings.
- In the UK, a litigant can ask for a transcript of the court proceedings for a fee if the hearing is recorded.

What is the transcript in court?

- A transcript is a written record of spoken language. In court proceedings, a transcript is usually a record of all decisions of the judge, and the spoken arguments by the litigants' lawyers.
- Audio files, such as recordings and podcasts, are commonly transcribed into readable, written text.

Jadui Pitara

Why in News

As envisaged under National Education Policy 2020, the Union Education Minister has recently launched Jadui Pitara- a play-based learning-teaching material for Foundational Stage.

Important Points

What is Jadui Pitara?

- It is a play-based learning-teaching material tailored for children between the age group of 3-8 years.
- It comprises playbooks, toys, puzzles, posters, flash cards, story books, worksheets as well as reflecting the local culture, social context and languages is designed to pique curiosity and accommodate the diverse needs of learners in the foundational stage.
- It was developed under the National Curriculum Framework(NCF) and is available in 13 Indian languages.
- The National Education Policy 2020 envisages 5+3+3+4 curriculum pedagogical structure.
- The Department of School Education & Literacy under Ministry of Education has constituted a National Steering Committee headed by Prof. K. Kasturirangan to develop the National Curriculum Framework for each of the stages.

- The NCF for foundational stage (FS) was launched by Ministry of Education on 20th October, 2022 and as per the curriculum framework, NCERT has developed and collected Learning Teaching Material (LTM). Accordingly, "Learning Teaching Material" for foundational stage was launched today using the concept of "Jaadui Pitara".
- It is expected to bring NEP and NCF-FS to practice, in the hands of teachers and students.

The salient points of "Jaadui Pitara" are as follows:

- CORE transformative aspect of NCF-FS – 'learn through Play':
- Foundational Stage – ages 3-8- learn best and effectively through Play
- Research from fields as diverse as Neurosciences to Education
- Applies to Class 1 & 2 also (age 6-8) – huge shift – children will learn through play, have fun, and FLN will be addressed.
- Learning and Development in 5 domains: Physical Development, Socio-emotional and Ethical Development, Cognitive Development, Language and Literacy Development, Aesthetic and Cultural Development, Positive Learning Habits has been included as another domain of development at this stage.
- Jaadui Pitara brings all this to life:
- Range of resources.
- Flexibility to accommodate variety and local resources.
- Fun.

Revised Guidelines on MPLADS 2023

Why in News

Ministry of Statistics & Programme Implementation has recently released the Revised Guidelines on Members of Parliament Local Area Development Scheme (MPLADS)-2023.

Important Points

The revised Guidelines

- The revised set of guidelines aims to broaden the scope of the Scheme so as to enable the Hon'ble MPs to recommend the developmental works as per the changing needs of the community; with an emphasis on improving the functioning, implementation and monitoring of the MPLAD scheme.
- A new Web-Portal, for implementation of the Revised Fund Flow Procedure under MPLADS was also launched.
- The entire process of fund flow under the revised guidelines will operate through the web portal, which will facilitate real-time monitoring, greater transparency and accountability in the system, and improved efficiency and effectiveness of the MPLAD Scheme.

About MPLAD Scheme

- The scheme was launched in 1993-94.
- The objective is to enable the Members of Parliament (MP) to suggest and get executed developmental works of ca
- Under the scheme, each MP has the choice to suggest to the District Collector for works to the tune of Rs.5 Crores per annum to be taken up in his/her constituency.
- The Rajya Sabha MPs can recommend works in one or more districts in the State from where he/she has been elected.
- The Nominated Members of the Lok Sabha and Rajya Sabha may select any one or more Districts from any one State in the Country for implementation of their choice of work under the scheme.

- The Members of Parliament Local Area Development Division, Ministry of Statics and Programme Implementation is entrusted with the responsibility of implementation of the scheme.
- MPs can recommend work of upto 25 lakh for Natural Calamity in the state and upto Rs. 1 crore in the country in case of Calamity of Severe Nature.
- MPs need to recommend work worth at least 15% and 7.5% of their funds to create assets in areas inhabited by SCs and STs respectively.
- Funds for MPLADS can be converged with MGNREGA for creating more durable assets and with the National Program for Development of Sports (Khelo India).
- The annual entitlement of Rs 5 crore shall be released, in two equal instalments of Rs 2.5 crore each, by Government of India directly to the District Authority of the Nodal District of the Member of Parliament concerned.
- The District Authority shall be responsible for timely and effective implementation of such works.

Second edition of the Foundational Literacy and Numeracy (FLN) report

Why in News

The second edition of the FLN report was released by Dr Bibek Debroy, Chairman, Economic Advisory Council to the Prime Minister (EAC-PM).

Important Points

- The report was released at #TheIndiaDialog organised by Institute for Competitiveness and US-Asia Technology Management Center, Stanford University, on February 23 & 24, 2023.
- It highlights the focus on language as a critical foundational skill and its importance in acquiring early literacy.
- A special section in the report covers insights into states/UTs to assess children's learning outcomes on the National Achievement Survey (NAS) and Foundational Learning Study (FLS) 2022.
- State profiles and their performance on Distance from the Frontier are covered, enabling states/ Union Territories to track progress on foundational learning.
- It captures the role of language in education and focuses on improving the learning outcomes using appropriate assessments and medium of instruction.
- It captures the fundamental concepts children require to become skilled readers and highlights distinct challenges faced in a multilingual environment.
- A section of the report explicitly focuses on the numerous initiatives currently implemented at the national and state level in collaboration with public-private organizations, demonstrating their efforts in achieving foundational learning goals as outlined in NIPUN.
- The report continues to be a benchmark for states and union territories to track their performance relative to their peers in achieving universal foundational learning by 2026-27.
- West Bengal maintained its lead while Uttar Pradesh stood at the bottom among large state categories on the second edition of the FLN index.
- Among smaller states, Punjab was at the top of the index while Telangana was at the bottom while Puducherry topped the index among union territories while Ladakh was the worst performer.
- Among north-eastern states, Sikkim was at the top while Meghalaya was at the bottom of the index. There are four categories in which regions have been divided, large states, small states union territories and north-east, for indexation.
- As per the report, India's overall average score was 44.48 and 18 out of 36 state/UTs have scored above country average in FLN index.
- The index has ranked states on five key parameters and 36 indicators. These include educational infrastructure, access to education, basic health, learning outcomes and governance.
- The report's findings cover the role of nutrition, access to digital technology and language-focused instructional approach.
- It is further recommended to undertake various assessments pertaining to the linguistic system (includes phonology, vocabulary/lexicon, and syntax), the orthographic system (includes symbols

and mapping principles), and the writing mechanisms and move the focus to improving the periodicity of NAS and the sample size of FLS for assessing the learning outcomes effectively.

- And finally, the need for data monitoring at a disaggregated level for FLN outcomes is also required to be integrated into the system, along with clearly defined outcome-based indicators on pedagogical framework and education in India.

About IFC

- Institute for Competitiveness, India is the Indian knot in the global network of the Institute for Strategy and Competitiveness at Harvard Business School.
- Institute for Competitiveness, India is an international initiative centered in India, dedicated to enlarging and purposeful disseminating of the body of research and knowledge on competition and strategy, as pioneered over the last 25 years by Professor Michael Porter of the Institute for Strategy and Competitiveness at Harvard Business School.
- Institute for Competitiveness, India conducts & supports indigenous research; offers academic & executive courses; provides advisory services to the Corporate & the Governments and organises events.
- The institute studies competition and its implications for company strategy; the competitiveness of nations, regions & cities and thus generate guidelines for businesses and those in governance; and suggests & provides solutions for socio-economic problems.

Ecological conservation initiatives in Union Budget 2023-24

Why in News

The Union Finance Minister, during her budget speech introduced schemes and policies aimed at ecological conservation.

Important Points

- This is part of a larger "green push" with focus on the environment and climate change. The following are the schemes announced.

MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes)

- MISHTI will facilitate mangrove plantation along India's coastline and on salt pan lands.
- It will operate through convergence between MGNREGS, CAMPA Fund and other sources.
- India has such forests on both its Eastern and Western coasts with the Sundarbans in Bengal being one of the largest mangrove forests on the planet.

PM PRANAM (Prime Minister Programme for Restoration, Awareness, Nourishment and Amelioration of Mother Earth)-

- This programme will seek to incentivise states and union territories promoting alternative fertilisers and the balanced use of chemical fertilisers
- The programme aims to ultimately bring down the government's subsidy burden, which is estimated to reach Rs 2.25 lakh crore in 2022-23: 39 per cent higher than last year's figure of Rs 1.62 lakh crore.

Bhartiya Prakritik Kheti Bio-Input Resource Centres

- To further facilitate the adoption of "natural farming," 10,000 Bio-Input Resource Centres will be set-up, creating a national-level distributed micro-fertiliser and pesticide manufacturing network.
- This will impact over 1 crore farmers over the next three years.

Amrit Dharohar-

- This is a scheme that will be implemented over the next three years to encourage optimal use of wetlands, and enhance bio-diversity, carbon stock, eco-tourism opportunities and income generation for local communities.
- Amrit Dharohar will emphasise on the importance of wetlands and their preservation, with an outlook that is inclusive of local communities as caretakers of the ecosystem.

Other elements of the Budget's Green Growth push

- Green Hydrogen Mission: The recently launched National Green Hydrogen Mission, with an outlay of Rs 19,700 crores, will facilitate transition of the economy to low carbon intensity, reduce dependence on fossil fuel imports, and make the country assume technology and market leadership in this sunrise sector. India aims to reach a target of an annual production of 5 MMT of green hydrogen by 2030.
- Energy Transition: The Budget has provided Rs 35,000 crore for priority capital investments towards energy transition and net zero objectives, and energy security by the Ministry of Petroleum & Natural Gas.
- Energy Storage Projects: To steer the economy on the sustainable development path, Battery Energy Storage Systems with capacity of 4,000 MWH will be supported with Viability Gap Funding. A detailed framework for Pumped Storage Projects will also be formulated.
- Renewable Energy Evacuation: The Inter-state transmission system for evacuation and grid integration

of 13 GW renewable energy from Ladakh will be constructed with investment of Rs 20,700 crore including central support of ` 8,300 crore.

- Green Credit Programme: For encouraging behavioural change, a Green Credit Programme will be notified under the Environment (Protection) Act. This will incentivize environmentally sustainable and responsive actions by companies, individuals and local bodies, and help mobilize additional resources for such activities.
- GOBARdhan scheme: 500 new 'waste to wealth' plants under GOBARdhan (Galvanizing Organic Bio-Agro Resources Dhan) scheme will be established for promoting a circular economy. These will include 200 compressed biogas (CBG) plants, including 75 plants in urban areas, and 300 community or cluster -based plants at total investment of Rs 10,000 crore.
- Coastal Shipping: Coastal shipping will be promoted as the energy efficient and lower cost mode of transport, both for passengers and freight, through PPP mode with viability gap funding.
- Vehicle Replacement: Replacing old polluting vehicles is an important part of greening our economy. In furtherance of the vehicle scrapping policy mentioned in Budget 2021-22, I have allocated adequate funds to scrap old vehicles of the Central Government. States will also be supported in replacing old vehicles and ambulances.

Ancient 'marine crocodile' fossil discovered

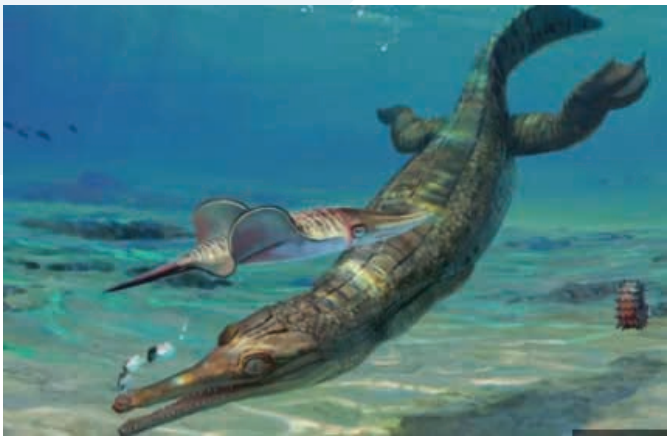
Why in News

Recently, Palaeontologists have uncovered a new thalattosuchian—an ancient "cousin" of modern-day crocodiles, which could be the oldest of its kind ever discovered.

Important Points

About Thalattosuchian

- The fossils uncovered on the Jurassic Coast in the United Kingdom include part of the head, backbone, and limbs of Turnersuchus hingleyae.
- The newly-discovered fossils of Turnersuchus hingleyae represent the only complete Thalattosuchian of its age and date back to the early Jurassic, Pliensbachian period, which was about 185 million years ago.
- The researchers stated that the discovery of this new fossil helps fill a gap in the fossil record and suggests that Thalattosuchians and other crocodile-like animals could have originated around 15 million years farther than Turnersuchus.
- Their analyses suggest that Thalattosuchians likely first appeared in the Triassic and survived the end-Triassic mass extinction.
- But, no expedition has found Thalattosuchians in Triassic rockets yet, which means that there is a ghost lineage.
- This means there is a group that scientists know existed, but they do not yet have fossil evidence.
- Until the discovery of the latest fossil, this ghost lineage extended from the end of the Triassic period till the Toarcian period. But now, it has been reduced by a few million years.
- Due to their relatively long, slender snouts, it is likely that they would have looked similar to the currently living gharial crocodiles.



- Gharial crocodiles are usually found in the major river systems of Northern India. But according to the researchers, though thalattosuchians' skulls looked similar to gharial crocodiles, they were constructed differently.
- The region of the skull housing jaw muscles was particularly large in the species, suggesting that they had enlarged jaw muscles that made fast bites possible.
- This would have been useful considering that most of their prey were probably fast-moving fish and cephalopods like squids and octopuses.

Yaya Tso lake

Why in News

Recently,the Biodiversity Management Committee, the panchayat of Chumathang village, along with SECURE Himalaya Project recently resolved to declare Yaya Tso as Ladakh's first biodiversity heritage site.

Important Points

About the lake

- Yaya Tso is known as birds' paradise for its beautiful lake located at an altitude of 4,820 metres.
- It is a nesting habitat for a large number of birds and animals, such as the bar-headed goose, black-necked crane and brahminy duck
- It also has the distinction of being one of the highest breeding sites of the black-necked crane in India.
- The lake could be reached from Mahe monastery on the way to Tsomoriri lake after driving up to the nunnery and then crossing a small mountain pass.
- The proposed Yaya Tso site will have an approximate area of 60 square kilometers, which will also include the lake's watershed.

What is the SECURE Himalaya Project?

- SECURE stands for Securing Livelihoods, Conservation, Sustainable Use and Restoration of High Range Himalayan Ecosystems.
- Launched in 2017, SECURE Himalaya Project is a part of "Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development" (Global Wildlife Program) funded by the Global Environment Facility (GEF).
- The project promotes sustainable management of alpine pastures and forests in the high range Himalayan ecosystems to secure conservation of globally significant wildlife, including endangered snow leopard and their habitats
- It seeks to ensure sustainable livelihoods and socio-economic benefits for communities in the selected high altitude landscapes in the Trans- and Greater Himalayan regions.
- It contributes to the Global Snow Leopard Ecosystem Protection Program (GSLEP), a joint initiative of 12 range country governments, international agencies, civil society, and the private sector.

Shaligram stone

Why in News

Shaligram stones, which are expected to be used for constructing the idols of Lord Ram and Janaki at the Ram Temple have arrived in Ayodhya in Uttar Pradesh

Important Points

What are Shaligram stones?

- Shaligram stones are fossils of ammonite, which is a type of mollusc that lived between 400 million and 65 million years ago.
- As per Geological Survey of India publication from 1904, shaligram stones date specifically from the Early Oxfordian to the Late Tithonian Age near the end of the Jurassic Period some 165-140 million years ago.
- Mostly found in riverbeds or banks of the Kali Gandaki, a tributary of the Gandaki River in Nepal, this stone is revered by Hindus who believe it to be a representation of Lord Vishnu(non-anthropomorphic representation).
- According to Hindu mythology, Lord Vishnu was cursed to become the shaligram stone for "betraying the chastity of the goddess Tulsi"
- The stone is considered to have divine powers and is seen as a symbol of good luck and prosperity.
- The fossils are considered holy by Hindus because Madhvacharya received it from Vyasa, also called Astamurti, and also they resemble symbols associated with Vishnu, mainly the Shankha (conch shell).

- Historically, the use of shaligrama shilas in worship can be traced to the time of Adi Shankara through the latter's works.
- The statue of Vishnu in the Padmanabhaswamy Temple of Thiruvananthapuram and Badrinath Temple of Garhwal region, and that of Krishna in Krishna Matha of Udupi and Radha Raman Temple of Vrindavana are also believed to be made from shaligrama shilas.

Why use the shaligram stone in the Ram temple?

- Lord Ram is believed to be the reincarnation of Lord Vishnu, and the use of the shaligram stone symbolises the connection between the two gods.
- The stones were brought to the site of construction from Galeshwar Dham in Janakpur, 100 km from Pokhara in Nepal.

Jupiter is the planet with most moons as twelve new moons discovered

Why in News

Recently, astronomers have discovered 12 new moons around Jupiter. This puts the total number of moons around the Solar System's largest planet at a record-breaking 92.

Important Points

- With the latest discovery, the number of moons around the orbit of Jupiter is more than any other planet in our solar system.
- Saturn, the one-time leader, comes in second with 83 confirmed moons.
- The dozen new moons were revealed in the observations conducted by astronomer Scott Sheppard from the Carnegie Institution for Science in Washington.
- The Jupiter moons were added recently to a list kept by the International Astronomical Union's Minor Planet Centre.
- They were discovered using telescopes in Hawaii and Chile in 2021 and 2022, and their orbits were confirmed with follow-up observations.
- These newest moons range in size from 0.6 miles to 2 miles (1 kilometer to 3 kilometers).

- The newly discovered moons are small and far out with their orbits stretching over 340 days. Meanwhile, nine of the 12 are among the 71 outermost Jovian moons, whose orbits are more than 550 days.
- Jupiter and Saturn are loaded with small moons, believed to be fragments of once bigger moons that collided with one another or with comets or asteroids.
- The same goes for Uranus and Neptune, but they're so distant that it makes moon-spotting even harder.
- For the record, Uranus has 27 confirmed moons, Neptune 14, Mars two and Earth one. Venus and Mercury come up empty.

About Jupiter

- Jupiter is the largest planet in the solar system.
- Jupiter is so large that all of the other planets in the solar system could fit inside it. More than 1,300 Earths would fit inside Jupiter.
- It is the fifth planet from the sun and its average distance from the sun is 5.2 astronomical units, or AU.
- When viewed from Earth, Jupiter is usually the second brightest planet in the night sky, after Venus.
- The planet is named after Jupiter, the king of the Roman gods in mythology.
- It is also called a gas giant planet and its atmosphere is made up of mostly hydrogen gas and helium gas, like the sun.
- The planet is covered in thick red, brown, yellow and white clouds and the clouds make the planet look like it has stripes.
- One of Jupiter's most famous features is the Great Red Spot, a giant spinning storm, resembling a hurricane.
- It rotates, or spins, faster than any other planet.
- One rotation equals one day and Jupiter's day is only about 10 hours long.
- Its orbit around the sun is elliptical, or oval-shaped.
- Jupiter takes 12 Earth years to make one revolution around the sun, so one year on Jupiter is equal to 12 years on Earth.
- The planet's four largest moons are Ganymede, Callisto, Io (eye-OH), and Europa.
- Ganymede is the largest moon in the solar system and is larger than the planet Mercury and three-fourths the size of Mars.
- Ganymede is the only moon in the solar system known to have its own magnetic field.
- Ganymede and Callisto have many craters and appear to be made of ice and rocky material.
- These four moons are called the Galilean satellites as Italian astronomer Galileo Galilei discovered these moons in 1610

Turkey Earthquake-the country's worst disaster since 1939

Why in News

Turkey was recently hammered by a series of powerful earthquakes with a magnitude of 7.8.

Important Points

Causes for recent earthquakes

- The region where the earthquake has struck lies along a well known seismic fault line called the Anatolia tectonic block that runs through northern, central, and eastern Turkey.
- It is a seismically active zone — though not as active as, say, the Himalayan region which is one of the most dangerous regions in the world from the perspective of earthquakes.
- The seismicity in this region is a result of interactions between the African, Eurasian, and Arabian plates.
- The Arabian plate is known to be pushing northward, which results in a slight westward movement for the Anatolian plate, where Turkey is located.

- Latest earthquake happened around the near-vertical fault line on the eastern Anatolian block, close to the Syrian border.
- The mechanism and location of the earthquake are consistent with the earthquake having occurred on either the East Anatolia fault zone or the Dead Sea transform fault zone.
- The East Anatolia fault accommodates the westward extrusion of Turkey in the Aegean Sea, while the Dead Sea Transform accommodates the northward motion of the Arabian peninsula relative to the Africa and Eurasia plates
- In the Eastern Mediterranean Region comprising Turkey, Syria and Jordan, tectonics are dominated by complex interactions between the African, Arabian, and Eurasian tectonic plates, and the Anatolian tectonic block.

Dominant Structures here are

- Red Sea Rift, the spreading centre between the African and Arabian plates;
- Dead Sea Transform, a major strike-slip fault that also accommodates Africa-Arabia relative motions;
- North Anatolia Fault, a right-lateral strike-slip structure in northern Turkey accommodating much of the translational motion of the Anatolia block westwards with respect to Eurasia and Africa;
- Cyprian Arc, a convergent boundary between the Africa plate and the Anatolia block.
- Turkey's earthquakes emerged from relatively shallow depths which made them devastating.
- The first earthquake, of magnitude 7.8, originated 17.9 km below the Earth's surface. All the subsequent ones, including the one of 7.5 magnitude, emerged from even closer to the surface.
- Shallow earthquakes are generally more devastating because they carry greater energy when they emerge on the surface.
- Deeper earthquakes lose much of their energy by the time they come to the surface.
- The deeper quakes spread farther though — the seismic waves move conically upwards to the surface — even as they lose energy while travelling greater distances, and hence cause less damage.
- Large earthquakes, of magnitude 5 or higher, have not been very frequent in recent years.
- Only three earthquakes of magnitude 6 or more have happened in the region since 1970. The last major quake in this area came in January 2020.

What is Magnitude?

- Magnitude is a measure of how big the waves are, while the strength refers to the energy it carries.
- Magnitude is measured on a logarithmic scale, which means the seismic waves produced by a magnitude 6 earthquake have 10 times higher amplitude than the ones produced by a magnitude 5 earthquake.
- The energy differential is even higher, 32 times for every change of 1 in magnitude.

What are aftershocks?

- Aftershocks are a sequence of earthquakes that happen after a larger mainshock on a fault.
- Aftershocks occur near the fault zone where the mainshock rupture occurred and are part of the "readjustment process" after the main slip on the fault.
- While they become less frequent with time, they can continue for days, weeks, months, or even years for a very large mainshock.
- Hours after a massive earthquake hit south-central Turkey and northern Syria, aftershocks have continued to cause damage and spread chaos.
- Massive earthquakes are often followed by multiple aftershocks, which can last for hours or even days.

The Erzincan earthquake

- The 1939 earthquake that Erdogan referred to is the Erzincan earthquake, in which about 33,000 people are thought to have been killed.
- It took place on December 26, 1939, and caused extreme damage in the Erzincan Plain and the Kelkit River Valley.
- The earthquake measured 7.8 on the Richter scale, occurred on the North Anatolian Fault Zone (NAFZ), and created a 360-km-long surface rupture, traces of which are still visible.
- Erzincan, historically Yerznka, is the capital of Erzincan Province in Eastern Turkey.

What is an earthquake?

- An earthquake is an intense shaking of the ground caused by movement under the earth's surface.
- It happens when two blocks of the earth suddenly slip past one another.
- This releases stored-up 'elastic strain' energy in the form of seismic waves, which spreads through the earth and cause the shaking of the ground.
- The location below the earth's surface where the earthquake starts is called the hypocenter, and the location directly above it on the surface of the earth is called the epicentre.

What exactly causes earthquakes?

- As we know, the earth's outermost surface, crust, is fragmented into tectonic plates.
- The edges of the plates are called plate boundaries, which are made up of faults.
- The tectonic plates constantly move at a slow pace, sliding past one another and bumping into each other.
- As the edges of the plates are quite rough, they get stuck with one another while the rest of the plate keeps moving.
- Earthquake occurs when the plate has moved far enough and the edges unstick on one of the faults.

Why earthquakes remain unpredictable?

- Earthquakes continue to remain the most common natural hazard that cannot be predicted. As such, no early warning systems can be developed.
- Theoretically, it is possible to offer a lead time of a few seconds between the time of the origin of the earthquake and the time it reaches the Earth's surface.
- Seismic waves travel significantly slower than the speed of light — between 5 and 13 km per second.
- So if the earthquake is detected as soon as it is triggered, information about it can be related a few seconds ahead of it reaching the ground.
- Such systems are already in use in some locations to issue alerts about earthquakes. However, these are not predictions. The alerts are issued post-event.
- Attempts to find reliable predictors to earthquakes have not been fruitful so far.
- Scientists have been able to map the areas that are earthquake prone, and are likely to generate earthquakes in future, but there is no way to predict when.
- For example, scientists say the Himalayan region has so much accumulated stress beneath the surface that it could result in multiple 7 or 8 magnitude earthquakes. But it cannot be predicted when that would happen.
- Between one and three earthquakes of magnitude 8 or above are recorded every year on average, while 10-15 earthquakes of magnitude between 7 and 8 occur.

E20 Fuel

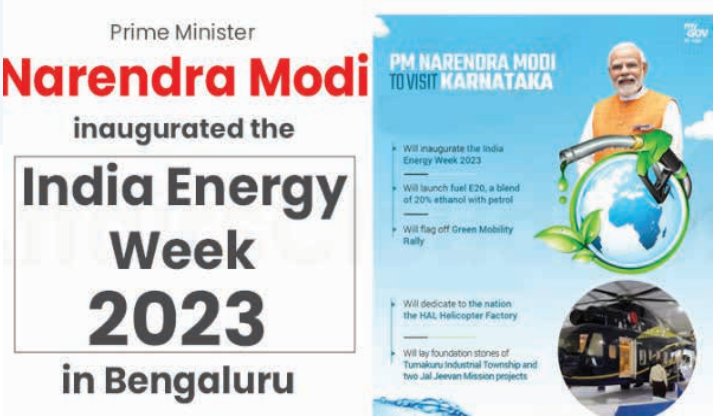
Why in News

The Prime Minister of India officially announced the availability of E20 at the India Energy Week (IEW) 2023 in Bengaluru.

Important Points

- The city of Bengaluru is among the ones that will have retail distribution of E20 fuel, a blend of 20% ethanol and 80% petrol starting from February 2023.
- Bengaluru is among the 15 cities across India that will get E20 fuel through outlets run by Indian Oil Corporation in the first phase, two months ahead of the Centre's initial rollout plan for April 2023.
- E20 is a blend of 20% ethanol with petrol.
- The Government aims to achieve a complete 20% blending of ethanol by 2025, and HPCL and other oil marketing companies are setting up 2G-3G ethanol plants that will facilitate the progress.
- In the next two years its retailing would be expanded throughout the country.
- According to the PM, with 10% blending, the country saved a forex outgo of Rs 53,894 crore, in addition, increased use of biofuels would lead to a cut in emissions.

What is Ethanol Blending?



- Ethyl alcohol or ethanol (C_2H_5OH) is a biofuel that is made naturally by fermenting sugar derived from sugarcane or other organic matter like foodgrains (corn, grain).
- As part of its carbon reduction commitments, India has launched the Ethanol Blended Petrol (EBP) programme to mix this biofuel with petrol to reduce the consumption of petrol.
- India has already met its E10 target, so petrol used in the country has 10% ethanol in it.
- The E20 pilot covers at least 15 cities and will be rolled out across the country in a phased manner.

Why Increase Blending?

- India imported 185 million tonnes of petroleum at a cost of $551 billion in 2020-21. As most of the petroleum products are used in transportation, a successful E20 programme can save the country $4 billion or Rs 30,000 crore per annum.

Solar double burner cook-top

- As part of its sustainability and environment protection initiatives Indian Oil Corporation(IOC) has

also designed a patented indoor solar double burner cook-top, a hybrid solution that works on both solar and auxiliary energy sources, which would be made available to three crore families in the country in the next two to three years.

- The oil firm also has a mandate to recycle 10 crore plastic bottles a year to produce fabric/poli yarn to be used in making uniforms for close to 35,000 of its employees.

India Energy Week (IEW

- IEW is the preeminent event for experts in the traditional and non-traditional energy industry from around the world.
- It is aimed to showcase India's rising prowess as an energy transition powerhouse.

Roadmap for Ethanol Blending in India: 2020-2025

- According to "Roadmap for Ethanol Blending in India: 2020-2025" a report by a special expert committee set up by the Centre, India's net import of petroleum was 185Mt at a cost of $551 billion in 2020-21.
- Most of the petroleum products are used in transportation.
- Hence, a successful E20 programme can save the country $4 billion per annum, that is, around Rs 30,000 crore.
- Besides, ethanol is a less polluting fuel, and offers equivalent efficiency at lower cost than petrol.
- Availability of large arable land, rising production of foodgrains and sugarcane leading to surpluses, availability of technology to produce ethanol from plant based sources, and feasibility of making vehicles compliant to ethanol blended petrol make E20 not only a national imperative, but also an important strategic requirement.
- It adds that different agencies of the government have made rapid moves to put in place a favourable regulatory and retail ecosystem for safe, and effective use of ethanol blended petrol and that Oil Marketing Companies have prepared their plans for phased rollout, and vehicle manufacturers have assured of making a similar plan once the intention of the government with timelines is publicly declared.

E20 Study & R&D Outside India

- A project to study the suitability of 20% ethanol-gasoline blend (E20) with in-use vehicles was undertaken by Automotive Research Association of India (ARAI), Indian Institute of Petroleum (IIP) and Indian Oil Corporation (R&D) during 2014-15, with a funding from Department of Heavy Industry (DHI).
- Material compatibility tests revealed that the metals and metal coatings had no issue with E20. Elastomers had inferior performance with E20 compared to neat gasoline. Plastic PA66 had a drop in tensile strength after use with E20.
- In the vehicle level studies, fuel economy decreased up to 6% (depending on the vehicle type) on an average basis. The test vehicles passed startability and drivability tests at hot and cold conditions with E0 and E20 test fuels.
- In all the cases, there was no severe malfunction or stall observed at any stage of vehicle operation.
- No abnormal wear of engine components or deposits or deterioration of engine oils were observed after the on-road mileage accumulation trials
- Joint studies reported by the Massachusetts Institute of Technology (MIT) and Honda R&D indicate that the improvement in relative efficiency up to 20% can be achieved with E20 compared to normal gasoline, when the engine is properly tuned.
- Trials undertaken by Ford Motor Company concluded that the engine optimised for E20 fuel showed comparable volumetric fuel economy (mileage) and range (kilometres travelled in single fill) of normal gasoline with a CO2 reduction of 5%

Environmental Impact

- Pointing out that vehicular emissions such as Carbon Monoxide (CO), Hydrocarbons (HC) and Oxides of Nitrogen (NOx) are currently under regulation in India, the report argued that use of ethanol blended gasoline decreases these emissions.
- Higher reductions in Carbon Monoxide emissions were observed with E20 fuel – 50% lower in two-wheelers and 30% lower in four-wheelers.
- Hydrocarbon emissions are reduced by 20% with ethanol blends compared to normal gasoline. Nitrous Oxide emissions did not show a significant trend as it depended on the vehicle/engine type and engine operating conditions.

- The unregulated carbonyl emissions, such as acetaldehyde emission were, however, higher with E10 and E20 compared to normal gasoline, due to the presence of hydroxyl groups in ethanol.
- However, these emissions were relatively minor (in few micrograms) compared to regulated emissions (which were in grams). Evaporative emission test results with E20 fuel were similar to E0.
- Overall, ethanol blending can help decrease emissions from both two-wheelers and four-wheelers.

Other Impact

Further, there are also various other impacts use of such fuel will have — primarily on the consumer, vehicle manufacturers and component manufacturers.

For the consumers, there are two and here's what the report found:

- Fuel Efficiency: While using E20 fuel, there will be a drop in fuel efficiency by nearly 6-7% for 4-wheelers designed for E0 and calibrated for E10; 3%-4% for 2-wheelers designed for E0 and calibrated for E10; 1-2% for 4-wheelers designed for E10 and calibrated for E20. However, with the modifications in engines (hardware and tuning), the loss in efficiency due to blended fuel can be reduced.
- Startability: In the E20 project, the results indicated that the test vehicles passed startability and drivability tests at hot and cold conditions with E0 and E20 test fuel. In all the cases, there was no severe malfunction or stall observed at any stage of vehicle operation.

And, vehicle manufacturers need the following changes in production lines to produce compatible vehicles:

- Engines and components will need to be tested and calibrated with E20 as fuel
- Vendors need to be developed for the procurement of additional components compatible with E20 All the components required can be made available in the country.
- No significant change in the assembly line is expected

For Component manufacturers:

- There will be no major structural change in the components in migrating from E10 to E20
- There will be changes in material of piston rings, piston heads, O-rings, seals, fuel pumps etc., all of which can be produced in the country

Save Wetlands Campaign

Why in News

Union Minister for Environment, Forest and Climate Change launched the 'Save Wetlands Campaign' in the presence of the Chief Minister of Goa.

Important Points

About the campaign

- This campaign is structured on a "whole of society" approach for wetlands conservation, enabling affirmative actions for wetlands conservation at all levels of the society and involving all strata of the society.
- This campaign over next one year will include sensitizing people of the value of wetlands, increasing the coverage of wetland mitras and building citizen partnerships for wetlands conservation.
- Two publications were also released during the occasion, 'India's 75 Amrit Dharohar- India's Ramsar Sites Factbook' and ' Managing Climate Risks in Wetlands – A Practitioner's Guide.
- The factbook is a one-stop resource of information on our 75 Ramsar Sites, including their values, threats they face and management arrangements.

- The practitioner's Guide on Climate Risk Assessment provides step-wise guidance on assessing the site-level climate risks and integration of adaptation and mitigation responses into the wetland management plan.
- World Wetland Day is celebrated annually on February 2 with the aim to create awareness of the vital role wetlands play for people and the planet.
- The proposal for the convention on wetlands was first made on February 2, 1971, in the Iranian city of Ramsar.

- The theme for 2023 World Wetlands Day was 'It's Time for Wetlands Restoration,' which focuses on the urgent need to prioritize wetland restoration.

Mission Sahbhagita

- In line with emphasis on participatory management of wetlands by Prime Minister Shri Narendra Modi and the mission and vision of Sahbhagita Mission, based on advisory issued by the Ministry, State Governments and UT administrations celebrated World Wetlands Day enthusiastically at all 75 Ramsar sites. The wetland pledge was administered during these events.
- The site level celebrations was followed by a Regional Consultative Workshop for Restoration and Integrated Management of Wetlands held at Goa on February 3, 2023 which saw participation of 48 representatives from 7 states namely Gujarat, Haryana, Punjab, Goa, Maharashtra, Rajasthan and Uttar Pradesh.
- This workshop, organised under Mission Sahbhagita, is a platform for sharing wetland management experiences, success stories, best practices as well challenges.
- The Ministry of Environment, Forest and Climate Change (MoEFCC) launched Mission Sahbhagita in 2022 with a mission of 'a healthy and effectively managed network of 75 wetlands of national and international significance which support water and food security; buffer from floods, droughts, cyclones and other extreme events; employment generation; conservation of species of local, national and international significance; climate change mitigation and adaptation actions; and recognition, conservation and celebration of cultural heritage.

The Glasgow Financial Alliance for Net Zero (GFANZ)

Why in News

A recent analysis comparing industry pledges to climate action by the France-based group Reclaim Finance shows banks and financial institutions, a part of the GFANZ initiative, continue to invest billions in fossil fuels.

Important Points

GFANZ

- It is a global coalition of leading financial institutions committed to accelerating the decarbonization of the economy.
- GFANZ was launched in April 2021 by the UN Special Envoy on Climate Action and Finance and the COP26 presidency, in partnership with the UNFCCC Race to Zero campaign, to coordinate efforts across all sectors of the financial system to accelerate the transition to a net-zero global economy.
- Achieving the objective of the Paris Agreement to limit global temperature increases to 1.5°C from pre-industrial levels requires a whole economic transition.
- Every company, bank, insurer, and investor will need to adjust their business models, develop credible plans for the transition to a low-carbon, climate-resilient future, and then implement those plans.
- It provides the tools and resources the financial sector needs to implement its net-zero commitments.
- It estimates a requirement of USD 100 trillion of finance for global net zero by 2050.
- It was founded for two equally important purposes:
- To expand the number of net zero-committed financial institutions and
- To establish a forum for addressing sector-wide challenges associated with the net-zero transition, helping to ensure high levels of ambition are met with credible action.
- GFANZ brings together independent, sector-specific alliances to tackle net-zero transition challenges and connects the financial community to the Race to Zero campaign, climate scientists and experts, and civil society.

What is Net zero?

- Net zero refers to a state in which the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere.
- The term net zero is important because – for CO2 at least – this is the state at which global warming stops. The Paris Agreement underlines the need for net zero.
- It requires states to 'achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century'.

GSI has established "inferred" lithium resources in J&K

Why in News

Recently, the Geological Survey of India (GSI) has established "inferred" lithium resources of 5.9 million tonnes in Salal -Haimana area of Reasi District of Jammu and Kashmir.

Important Points

- These resources have been established as part of the "Reasi Sersandu-Kherikot-Rahotkot-Darabi" mineral block, where prospecting has been ongoing since 2021-22.
- Under the United Nations Framework for Classification for Reserves and Resources of Solid Fuels and Mineral Commodities (UNFC 1997), the stage of prospecting is categorised as 'G4' when it entails reconnaissance surveys — a fairly advanced stage of prospecting.
- The finds in this case are learnt to include bauxite (the ore for aluminium) and rare earth elements, alongside lithium.
- There are two caveats with the latest lithium find: first, the new find is categorised as "inferred" — one of three categories that mineral resources are subdivided into, in order of increasing geological confidence.
- The "inferred" mineral resource is the part of a resource for which quantity, grade and mineral content are estimated only with a low level of confidence based on information gathered from locations such as outcrops, trenches, pits, workings and drill holes that may be of limited or uncertain quality, and also of lower reliability from geological evidence.
- Second, the lithium find in J&K, in inferred terms, is also comparatively small, considering that proven reserves in Bolivia are 21 million tonnes, 17 million tonnes in Argentina, 6.3 million tonnes in Australia, and 4.5 million tonnes in China
- Currently, India is almost entirely dependent on import of these cells and the move to ink sourcing pacts for lithium is seen as another salvo in the front against imports from China, the major source of both the raw material and cells.

According to the Ministry of Mines' approved annual Field Season programme (prospecting plan), the GSI takes up different stages of mineral exploration .

- Reconnaissance surveys (G4).
- Preliminary exploration (G3), and
- General exploration (G2) as per the guidelines of UNFC and the Minerals (Evidence of Mineral Contents) Amendment Rules, 2021 (Amended MMDR Act 2021) for augmenting mineral resources for various mineral commodities, including lithium.

About Lithium

- Lithium (Li), chemical element of Group 1 (Ia) in the periodic table, the alkali metal group, lightest of the solid elements.
- The metal itself which is soft, white, and lustrous and several of its alloys and compounds are produced on an industrial scale. Three fragments of Lithium metal.

- The principal industrial applications for lithium metal are in metallurgy, where the active element is used as a scavenger (remover of impurities) in the refining of such metals as iron, nickel, copper, and zinc and their alloys.
- A large variety of nonmetallic elements are scavenged by lithium, including oxygen, hydrogen, nitrogen, carbon, sulphur, and the halogens.
- A lithium-ion (Li-ion) battery is an advanced battery technology that uses lithium ions as a key component of its electrochemistry.
- It is also extensively used in the production of other organic chemicals, especially pharmaceuticals.
- With 8 million tons, Chile has the world's largest known lithium reserves. This puts the South American country ahead of Australia, Argentina and China.
- Lithium can be extracted in different ways, depending on the type of the deposit — generally either through solar evaporation of large brine pools, or from hard-rock extraction of the ore.
- In India, there is some potential to recover lithium from brines of Sambhar and Pachpadra areas in Rajasthan, and Rann of Kutch, Gujarat.
- The major mica belts located in Rajasthan, Bihar and Andhra Pradesh and the pegmatite belts in Odisha, Chhattisgarh, alongside rock mining being undertaken at Mandya, Karnataka, are other potential geological domains of the country.
- This is part of a concerted domestic exploration push for the alkali metal — a vital ingredient of the Lithium-ion rechargeable batteries that power electric vehicles (EVs), laptops and mobile phones.
- The Atomic Minerals Directorate for Exploration and Research (AMD), an arm of the Department of Atomic Energy, had earlier conducted preliminary surveys that had shown the presence of lithium resources of 1,600 tonnes in the igneous rocks of the Marlagalla–Allapatna region of Karnataka's Mandya district.

Diyodar meteorite was India's first aubrite in 170 years

Why in News

Meteorite streaked over India in August, 2022, breaking apart as it descended through the air, to scatter over two villages in Banaskantha, Gujarat was India's first aubrite in 170 years.

Important Points

About Diyodar meteorite

- It stuck over two villages in Banaskantha of Gujarat, one piece struck a neem tree in Rantila village and shattered into several pieces. Another landed on the porch of a house in Ravel village, 10 km away, and met a similar fate.
- Analysis by a group of scientists at the Physical Research Labosratory (PRL), Ahmedabad, has revealed that this meteorite is a "rare, unique specimen" of aubrite.
- India has been the site of hundreds of meteorite crashes, but this is only the second recorded crash of an aubrite. The last was on December 2, 1852, in Basti, Uttar Pradesh.
- Worldwide, aubrites have crashed in at least 12 locations since 1836, including three in Africa and six in the U.S.
- According to the 'Encyclopedia of Physical Science and Technology' (2003), aubrites "are coarse-grained igneous rocks that formed" in oxygen-poor conditions, and thus "contain a variety of exotic minerals that are not found on Earth".
- For example, the mineral heideite was first described in the Basti meteorite.
- Meteors are pieces of some solid object in space that broke away, descended onto a planet or moon, and managed to reach the surface.

- Once on the surface, they are called meteorites. Aubrites are a type of meteorite; scientists are not yet sure of their origin, although some signs indicate that they could be from the asteroid 3103 Eger or from the planet Mercury.
- The pieces that fell in the two villages have been dubbed the Diyodar meteorite, after the taluka in which the villages are located.
- The PRL group obtained two fragments weighing 200 g and 20 g. They used a gamma-ray spectrometer, a spectroradiometer, electron-imaging, and chemical analyses to determine their mineral composition.
- They found that the fragments shared a crust that indicated they were part of the same larger rock.
- Around 90% of the meteorite was composed of orthopyroxene.
- Pyroxenes are silicates consisting of single chains of silica tetrahedra (SiO 4); orthopyroxenes are pyroxenes with a certain structure.
- Pyroxenes such as diopside and jadeite have been used as gems.
- Spodumene was historically used as lithium ore. Rocks with pyroxene have also been used to make crushed stone that is used in construction.
- They also noted that the pyroxene didn't contain any iron but was rich in magnesium.
- The group also classified the meteorite as a monomict breccia, meaning that it consisted of several pyroxene-bearing pieces held together by a scaffold of rocky material.
- Overall, they suggested that the meteorite is an aubrite.
- The conditions in which aubrites form are prevalent on the surface of Mercury; however, the researchers wrote that they "don't have any known Mercurian samples in our collection".
- So, they continued, the Diyodar meteorite "not only improves the existing meteoritic database but will be important for understanding planetary processes in the future."

IARI's InfoCrop

Why in News

The ICAR-Indian Agricultural Research Institute(IARI) scientists used InfoCrop version 2.1 to study the long-term impact of climate change and crop management practices on yield.

Important Points

- It is India's only dynamic crop simulation model developed and released by the institute in 2015.
- InfoCrop is more suited for India as it has the life cycle data for almost all the local varieties of 11 crops: paddy, wheat, maize, sorghum, pearl millet, pigeon pea, chickpea, soybean, groundnut, potato and cotton.
- In InfoCrop, the parameters are already calibrated to Indian crop varieties and they are updated at regular intervals by the institute.
- The parameters deal with aspects of weather (precipitation, temperature, radiation and others), crop growth (phenology, grain characteristics, leaf growth, temperature and flooding sensitivity and others), soil (texture and organic carbon, water holding characteristics and pH levels) and pests and crop management (organic matter, fertiliser and irrigation).
- Besides forecasting, simulation models can be used to assess crop loss in the aftermath of an extreme weather event, which can then be used to provide relief packages.
- Since the model can be used to simulate management scenarios, it can help improve crop yield.
- The model has an 85 per cent accuracy rate, which is on par with widely used dynamic models such as the Decision Support System for Agrotechnology Transfer model, developed by the US, and Agriculture Production Systems sIMulator, developed by Australia.
- The Union Ministry of Environment, Forest and Climate Change included the model's projections for 1976-2100 in the first two national communications, reports submitted to the UN Framework Convention on Climate Change detailing the level of vulnerability and risks the country faces due to the impacts of climate change.
- But the March experiment shows that the model can also be used for near-term forecasts.
- IARI launched its first simulation model, Wheat Growth Simulator, in the 1990s. It could predict the yield of two wheat crop varieties. In 2004, InfoCrop version 1 was launched.
- The model had to be updated because it did not include crucial parameters such as CO2 levels.

Thwaites Glacier

Why in News

Scientists studying Antarctica's vast Thwaites Glacier – nicknamed the Doomsday Glacier say warm water is seeping into its weak spots, worsening melting caused by rising temperatures.

Important Points

- Thwaites, which is roughly the size of Florida, represents more than half a meter (1.6 feet) of global sea level rise potential, and could destabilise neighbouring glaciers that have the potential to cause a further three-meter (9.8-foot) rise.
- As part of the International Thwaites Glacier collaboration – the biggest field campaign ever attempted in Antarctica – a team of 13 U.S. and British scientists spent about six weeks on the glacier in late 2019 and early 2020.
- Using an underwater robot vehicle known as Icefin, mooring data and censors, they monitored the glacier's grounding line, where ice slides off the glacier and meets the ocean for the first time.
- In one of the papers of Cornell University, researchers found that warmer water was making its way into crevasses and other openings known as terraces, causing sideways melt of 30 meters (98 feet) or more per year.
- The other paper's findings, showed about five meters (16 feet) per year of melt near the glacier's grounding line – less than what the most aggressive thinning models previously predicted.
- Scientists have previously depended on satellite images to show the behaviour of the ice, making it difficult to get granular details.
- The papers represent the first time a team has been to the grounding line of a major glacier, providing a look right where the action begins..
- The findings will help in the development of climate change models. These things can now be taken on board in the models that will predict the future behaviour.

About Thwaites Glacier

- Thwaites Glacier, nicknamed the Doomsday Glacier, is an unusually broad and vast Antarctic glacier flowing into Pine Island Bay, part of the Amundsen Sea, east of Mount Murphy, on the Walgreen Coast of Marie Byrd Land.
- Its surface speeds exceed 2 kilometres per year near its grounding line.
- Its fastest-flowing grounded ice is centered between 50 and 100 kilometres (31 and 62 mi) east of Mount Murphy. In 1967, the Advisory Committee on Antarctic Names named the glacier after Fredrik T.
- Thwaites Glacier is closely monitored for its potential to raise sea levels.
- Along with the Pine Island Glacier, it has been described as part of the "weak underbelly" of the West Antarctic Ice Sheet, because of its apparent vulnerability to significant retreat.

India can become a biodiversity champion

Why in News

The Budget's emphasis on green growth can improve the state of the country's biodiversity

Important Points

- The sum and variation of our biological wealth, known as biodiversity, is essential to the future of this planet.
- The importance of our planet's biodiversity was strongly articulated at the United Nations Biodiversity Conference (CBD) in Montreal, Canada.
- In December 2022, 188 country representatives adopted an agreement to "halt and reverse" biodiversity loss by conserving 30% of the world's land and 30% of the world's oceans by 2030, known as the 30×30 pledge.

India as a biodiversity champion

- India currently hosts 17% of the planet's human population and 17% of the global area in biodiversity hotspots, placing it at the helm to guide the planet in becoming biodiversity champions.
- In response to this call, the Union Budget 2023 mentioned "Green Growth" as one of the seven priorities or Saptarishis that will guide the country in its 'Amrit kaal' of next 25 years. The emphasis on green growth is welcome news for India's biological wealth as the country is facing serious losses of natural assets such as soils, land, water, and biodiversity.
- The National Mission for a Green India aka Green India Mission (GIM), one of the 8 missions under National Action Plan on Climate Change (NAPCC), aims to increase forest cover on degraded lands and protect existing forested lands.
- Green Credit Programme has the objective to "incentivize environmentally sustainable and responsive actions by companies, individuals and local bodies".
- Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI) is particularly significant because of the extraordinary importance of mangroves and coastal ecosystems in mitigating climate change.
- Prime Minister Programme for Restoration, Awareness, Nourishment, and Amelioration of Mother Earth (PM-PRANAM) for reducing inputs of synthetic fertilizers and pesticides is critical for sustaining our agriculture.
- Amrit Dharohar scheme directly mentions our biological wealth and is expected to "encourage optimal use of wetlands, and enhance biodiversity, carbon stock, eco-tourism opportunities and income generation for local communities".

Science-based biodiversity conservation:

- Science-based and inclusive monitoring programmes are critical not only for the success of these efforts but also for documentation and distillation of lessons learnt for replication, nationally as well as globally.
- New missions and programmes should effectively use modern concepts of sustainability and valuation of ecosystems that consider ecological, cultural, and sociological aspects of our biological wealth.
- With clear system boundaries, prioritisation of the benefits to 'resource people', and fund-services (rather than stock-flows) as the economic foundation for generating value has enormous potential for multiple sustainable bio-economies.
- The future of our wetland ecosystems will depend on how we are able to sustain ecological flows through reduction in water use in key sectors such as agriculture by encouraging changes to less-water intensive crops such as millets.
- Investments in water recycling in urban areas using a combination of grey and blue-green infrastructure is recommended.
- Implementation of Green India Mission should focus on ecological restoration rather than tree plantation and choose sites where it can contribute to ecological connectivity in landscapes fragmented by linear infrastructure.
- Site selection should also be carefully considered for the mangrove initiative with a greater emphasis on diversity of mangrove species with retention of the integrity of coastal mud-flats and salt pans themselves, as they too are important for biodiversity.
- Local community involvement: Finally, each of these efforts must be inclusive of local and nomadic communities where these initiatives will be implemented. Traditional knowledge and practices of these communities should be integrated into the implementation plans.
- Each programme should include significant educational and research funding to critically appraise and bring awareness to India's biological wealth.

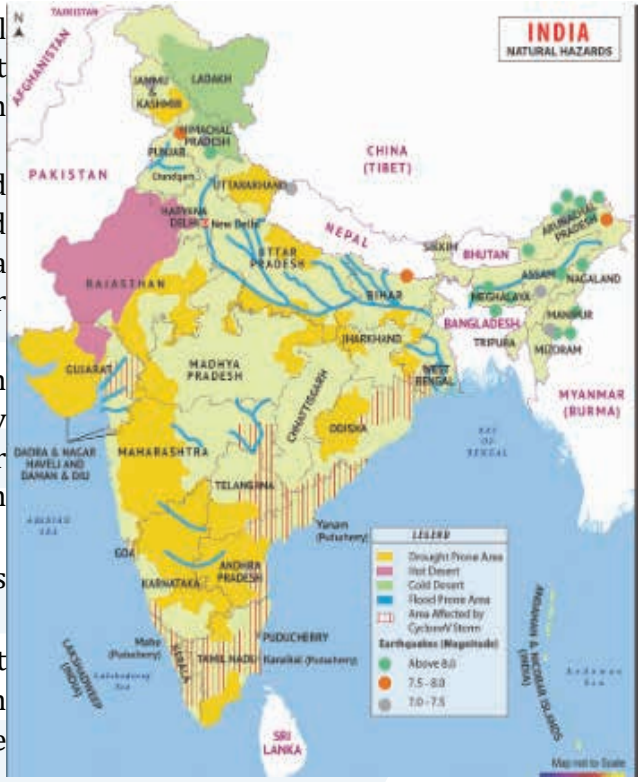
New policy to help Indian communities displaced by annual river & coastal erosion drafted

Why in News

Union home ministry had directed NDMA to draft a policy based on the 15th Finance Commission's report

Important Points

- The National Disaster Management Authority (NDMA) received the final inputs February 17, 2023 from disaster management officials and researchers on the draft of India's first national policy for the mitigation and rehabilitation of the people affected by river and coastal erosion.
- The Union Ministry of Home Affairs had directed NDMA to draft a policy based on the 15th Finance Commission's report for 2021, in which it had for the first time emphasised on rehabilitation and resettlement for people displaced by the river and coastal erosion, in view of the increasing threat due to climate change.
- Until now, most policies in the country only address displacement after sudden rapid-onset disasters such as floods and cyclones.
- Over the last two years, NDMA held national-level consultations with central ministries and state government departments as well as online consultations with non-governmental organisations.
- They also spoke to some 24 focus group and surveyed approximately 600 households in the coastal and riverine districts of Kerala, Tamil Nadu, Andhra Pradesh, Odisha, Assam, West Bengal, Bihar and Uttar Pradesh.
- "The urgency is there to take it to the logical conclusion at the earliest, which would involve the Union Ministry of Home Affairs' stamp of approval," a senior consultant with NDMA told Down to Earth (DTE) on the condition of anonymity.
- The 15th Finance Commission's report considers two aspects related to the new policy.
- First, it introduces mitigation measures to prevent erosion under the National Disaster Mitigation Fund (NDMF), with an allocation of Rs 1,500 crore for 2021-26.



- Second, for the resettlement of displaced people affected by erosion, it allocates R 1,000 crore for the same period under the National Disaster Relief Fund (NDRF).
- This is being taken out of the recovery and reconstruction window introduced for the first time under NDRF in 2021.
- For both funds, state governments will have to avail resources on a cost-sharing basis, contributing 25 per cent to the costs of mitigation and resettlement associated with coastal and river erosion; however, northeastern states have to only pool 10 per cent of state funds
- The commission's report emphasised that states must follow timelines for mitigation and rehabilitation projects without delays. Along similar lines, the summary of the draft policy said, "Projects under NDRF and NDMF should be sanctioned in such a manner that they can be completed within the award period of the Commission."
- District disaster management authorities would be the nodal agency to implement the measures, aided by other district agencies and a specific panchayat-level committee, NDMA's draft policy stated. It put in place some institutional mechanisms to manage displacement due to coastal and river erosion, which can be enacted under the Disaster Management Act of 2005.
- The DDMA will prepare mitigation and rehabilitation plans and submit them to the SDMAs, from where the proposed measures will be appraised by NDMA and finally submitted to the home ministry. A high-level committee of the ministry will then approve the disbursal of funds.
- After plans are approved and implementation begins, DDMAs will also be responsible for organising, monitoring and evaluation of the efforts under the supervision of their state and national counterparts.

Six extraordinarily massive first-generation galaxies discovered

Why in News

According to a new study, James Webb Space Telescope (JWST) has discovered six extraordinarily massive first-generation galaxies, formed roughly 500-700 million years after the Big Bang.

Important Points

- The study said that these galaxies challenge current understanding of galaxy formation as they should not have existed so early in their life.
- The study has revealed that Tens to hundreds of billions of sun-sized stars' worth of mass is formed in only five per cent of the time.
- The shapes of these galaxies weird. Despite having the same mass as the Milky Way, one of the galaxies is 30 times smaller.
- The team of scientists spotted these monster galaxies using the Cosmic Evolution Early 44 Release Science programme of JWST.
- The programme studies the formation of the earliest galaxies when the universe was less than five per cent of its current age.
- Researchers turned the telescope to a patch of the sky close to the Big Dipper, which appears to harbour a group of stars that form a pattern in the night sky.
- Hubble space telescope first observed this region in the 1990s.
- The galaxies are in the same area in the sky but are not close to each other in three-dimensional space. Some are much further away than others
- The stars appeared as bright and red "fuzzy dots". Red light typically means it is old.
- The universe is expanding. As most other galaxies move away from us, their light has shifted to longer, which means redder wavelengths.
- The team analysed these images further and found stellar masses greater than 10 billion solar masses, including one with a stellar mass of roughly 100 billion solar masses. One solar mass is the mass of our Sun.
- The Milky Way forms about one-two new stars every year. Some of these galaxies would have to be forming hundreds of new stars a year for the entire history of the universe.
- The findings are based on preliminary observations. The researchers said they need more data to confirm if the new galaxies are as old and massive as they seem.
- Alternatively, the light could be coming from faint quasars, which are short for quasi-stellar radio sources.
- A quasar is an intense beacon of light coming from the centre of some galaxies and is powered by supermassive black.
- If these galaxies are as massive as they appear, a different formation channel could have created these monster galaxies very quickly and efficiently.
- The researchers plan to split the light of each of these galaxies into its rainbow-like fingerprint using spectroscopy.
- This will tell us the distance with 0.1 per cent accuracy. It will also tell us what is producing the light, whether it is stars or something more exotic.

Commercial cultivation of liquorice (Mulethi)

Why in News

Himachal Pradesh has become first state in India to have organised cultivation of Mulethi recently.

Important Points

- Mulethi is a perennial shrub having sweet roots due presence of glycyrrhizin, which is 50 times sweeter than sucrose and it is used as a natural sweetener in herbal medicines, flavouring in candies and tobacco.

- Licorice, scientifically known as Glycyrrhiza glabra.
- It is also used in traditional medicine against treating chest and lung diseases etc.
- Mulethi is grown mainly in Afghanistan, while minor producing countries include Pakistan, China, Nepal and India.
- The properties of licorice are given as follows:
- It may show antibacterial, anti-inflammatory properties.
- It may show expectorant (helps in secretion of sputum) property.
- It may show demulcent (relieves irritation) property.
- Combat digestive issues.
- Helps in weight reduction.
- Improves immunity & combats respiratory infesctions.
- India imports 8047 tonnes of liquorice annually from Afghanistan, China and Nepal.
- Realising the large import of liquorice in the country, it was envisioned to extend its production area through initiating organized cultivation after identifying the potential areas in HP The districts of Hamirpur, Bilaspur, Kangra, Una, Solan and Sirmour in HP have potential areas for its cultivation.

Unity mall

Why in News

The Union Finance Minister announced in the Budget of 2023 that states would be encouraged to set up a Unity Mall.

Important Points

Unity Malls

- Unity malls would focus on the promotion and sale of the state's own "ODOPs (one district, one product), GI products and other handicraft products, and for providing space for such products of all other States".
- These malls will be set up in "state capitals, their most prominent tourism centres, or their financial capitals.
- Other handicraft products will also be sold in these malls. The Centre will also request the states to sell such products from other states as well.
- These Unity Malls are likely to be modelled around the Ekta Mall near the Statue of Unity in Gujarat.
- At present, an Ekta Mall is operational near the Statue of Unity, located about 3.5 km away from the statue at Ekta Nagar in Kevadia.
- The Ekta Mall – Unity in Handicrafts Diversity is a showroom of handicrafts from different states of India.

What is ODOP?

- One District, One Product is an initiative by the government which aims to make regional products more accessible, while providing capital to those who produce them.
- Under the scheme, the State identifies the chief product for a district, and then offers support for its processing, storage and marketing.
- These products can be perishable agri produce, cereal-based products or food products like mango, potato, meat and fisheries.
- The scheme also supports traditional and innovative products including waste-to-wealth products, such as honey and herbal edible products.

High Net worth Individuals (HNIs)

Why in News

Recently, institutional investors and family offices of high net worth individuals (HNIs) salvaged the Rs20,000 crore follow-on public offering (FPO) of Adani Enterprises Ltd.

Who are HNIs?

- HNIs or high net-worth individuals (HNIs) belong to the financial services sector where a class of individuals has an investible surplus of more than Rs 5 crore, below this threshold.
- Such investors are categorised as retail as they are measured by their net worth in the financial industry.
- Generally, HNIs are widely defined as people whose investible assets such as bonds and stocks exceed a certain amount.

- A high-net-worth individual is a person who owns liquid assets including money held in brokerage accounts or banks, and excluding assets like a primary residence, durable goods or collectibles.
- HNIs are always in high demand by private wealth managers because it takes a good amount of work to preserve and maintain such assets.
- The more liquid assets held by an individual, the more appealing an HNI becomes to wealth managers, given they earn money equal to a percentage of the total assets they manage.

Types of HNIs

- High-net-worth individuals (HNWIs): Investors who own liquid assets valued between Rs 5 lakh and Rs 5 crore.
- Very-high-net-worth individuals (VHNWIs): Investors who possess liquid assets valued between Rs 5 crore and Rs 25 crore.
- Ultra-high-net-worth individuals (UHNWIs): Investors who own more than Rs 25 crore in liquid assets.

What is follow-on public offering (FPO)?

- A follow-on public offering (FPO) is the issuance of shares to investors by a company listed on a stock exchange.
- A follow-on offering is an issuance of additional shares made by a company after an initial public offering (IPO). Follow-on offerings are also known as secondary offerings.
- An FPO is carried out with the goal to raise additional capital as well as reduce any existing debt that the company needs to pay off.

World Economic Situation & Prospects report-2023

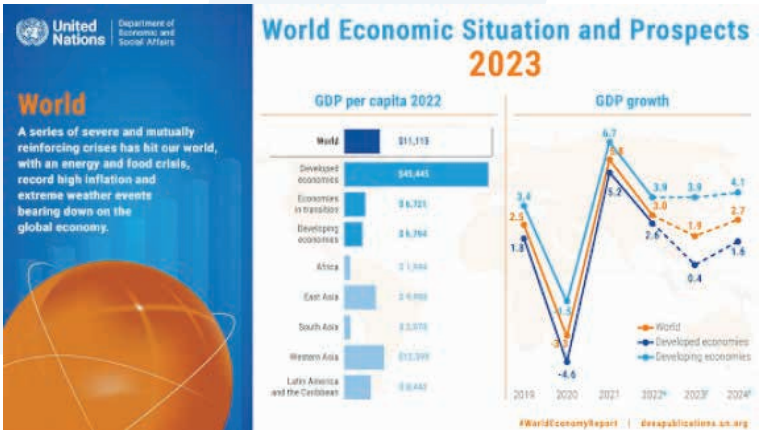
Why in News

The United Nations' World Economic Situation and Prospects 2023 was published recently.

Important Points

Following are the key highlights of the report:

- According to the new report, Global gross domestic product (GDP) is forecast to drop to 1.9 per cent in 2023 from 3 per cent in 2022.
- The reasons are the food and energy crises that hit the world economy hard in 2022, against the backdrop of COVID-19 and the Ukraine war.
- The world's output growth can bounce back to 2.7 per cent in 2024, subject to a change in the war situation and the disruption of supply chains.
- The world's average inflation rate was at 9 per cent in 2022, which led to budgetary constraints in several developed as well as developing countries.



- In South Asia, the economic outlook has significantly deteriorated due to high food and energy prices, monetary tightening and fiscal vulnerabilities.
- Average GDP growth is projected to moderate from 5.6 per cent in 2022 to 4.8 per cent in 2023.
- On the contrary, growth in India is expected to remain strong at 5.8 per cent, albeit slightly lower than the estimated 6.4 per cent in 2022, as higher interest rates and a global slowdown weigh on investment and exports.
- The report indicated that India's food and energy subsidies prevented a major downfall.
- The report said that the prospects are more challenging for other economies in the region. Bangladesh, Pakistan and Sri Lanka sought financial assistance from the International Monetary Fund (IMF) in 2022.
- A slight reversal in poverty eradication was noted in early 2019, but this halted due to the pandemic.

- According to the World Bank, several global crises pushed an additional 75 to 95 million people into extreme poverty in 2022, compared to pre-pandemic projections.
- Income inequalities were evident. Globally, the average income for the bottom 40 per cent was $2,935 in 2021, a slight decline from $2,951 in 2019.
- The average income for the top 10 percent income group increased from $124,668 in 2019 to $126,153 in 2021,18 signalling widening income inequality.
- The International Monetary Fund has an allocation called the Special Drawing Rights (SDR), to provide liquidity to the global financial system in times of emergencies.
- In August 2021, a $650 billion lending was arranged from the SDR, which is the largest amount withdrawn for this purpose in history.
- Of this amount, only $21 billion was allocated to low-income countries. However, some countries such as China donated some of their SDR $10 billion of its $40 billion to African countries.
- While the SDRs remain an important source of liquidity support for countries facing balance-of-payment challenges, the interest rate on them rose sharply in 2022.
- The international community will need to cap interest and charge rates to ensure that the poorest and most vulnerable countries can access the facility to meet near-term financing needs.
- The Group of 20 Common Framework for Debt Treatments is considered the main international debt relief mechanism that was availed of by only three countries.
- It is a programme offered by G20 countries to defer official debt service, particularly by developing countries and low-income countries.

South India's 1st Industrial Corridor Project

Why in News

Prime Minister has recently laid the foundation stone of South India's 1st Industrial Corridor Project to be implemented at Tumakuru which is spread over 8500 Acre of land under the Chennai Bengaluru Industrial Corridor(CBIC).

Important Points

- Tumakuru Industrial Township(part of CBIC) has been planned with a holistic and integrated approach in line with the principles of PM-GatiShakti to address the issue of last mile multi-modal connectivity to the economic zone.
- The Government of India, through the National Industrial Corridor Development and Implementation Trust (NICDIT), and the Government of Karnataka, through the Karnataka Industrial Area Development Board (KIADB), have taken up the development of the Industrial Township at Vasanthanarsapura, spread across 8500 acres in three phases in Tumakuru district through the project Special Purpose Vehicle (SPV).
- Based on the principles of last mile multimodal connectivity of PM-GatiShakti, the upcoming industrial township will have world class infrastructure with Mumbai-Chennai National Highway 48 adjoining the site.
- The CBIC project includes the development of industrial townships at three nodes: Krishnapatnam (Andhra Pradesh), Tumakuru (Karnataka), and Ponneri (Tamil Nadu). The Tumakuru node has been prioritized for development, with an area of 1736.20 acre being identified as the priority development area.
- The Phase-A of the project is expected to generate employment opportunities for approximately 88,000 people and attract investment of around Rs. 7,000 crore over a period of 5-6 years, triggering growth and prosperity in the region.
- With the objective to increase the share of manufacturing in the GDP of India, the National Industrial Corridor Development Programme is being implemented whereby 32 greenfield industrial smart cities under 11 industrial corridors are being developed with world class Plug-n-Play infrastructure.
- With the Government's mantra of "Reform, Perform and Transform", 04 such smart industrial cities have already been completed at Dholera in Gujarat, Shendra Bidkin in Maharashtra, Vikram Udyogpuri in Madhya Pradesh, Integrated Industrial Township at Greater Noida in Uttar Pradesh.

Large Exposure Framework guidelines of RBI

Why in News

Amidst concern about the exposures of Indian banks to a business conglomerate, the RBI Governor has said that the large exposure framework of RBI is fully complied with by all the banks.

Important Points

What did RBI say?

- As the regulator and supervisor, the RBI maintains a constant vigil on the banking sector and on individual banks with a view to maintain financial stability.
- The RBI has a Central Repository of Information on Large Credits (CRILC) database system where the banks report their exposure of ₹5 crore and above which is used for monitoring purposes.
- As per the RBI's current assessment, the banking sector remains resilient and stable.
- Various parameters relating to capital adequacy, asset quality, liquidity, provision coverage and profitability are healthy.
- Banks are also in compliance with the Large Exposure Framework (LEF) guidelines issued by the RBI.

About large exposure framework(LEF) guidelines

- In January 1991, the Basel Committee on Banking Supervision (BCBS) issued supervisory guidance on large exposures, viz., Measuring and Controlling Large Credit Exposures.
- In order to foster a convergence among widely divergent national regulations on dealing with large exposures, the BCBS issued the Standards on 'Supervisory framework for measuring and controlling large exposures' in April 2014.
- The Reserve Bank has decided to suitably adopt these standards for banks in India and, accordingly, the instructions on banks' Large Exposures (LE) .
- Banks must apply LEF at the same level as the risk-based capital requirements are applied, that is, a bank shall comply with the LEF norms at two levels: (a) consolidated (Group1) level and (b) Solo2 level.
- Under the LEF, a bank's exposure to all its counterparties and groups of connected counterparties with some exemptions.

RBI's QR code-based Coin Vending Machine (QCVM)

Why in News

RBI has recently announced a pilot project for QR code-based Coin Vending Machine.

Important Points

About QR code-based Coin Vending Machine

- The QCVM is a cashless coin dispensation machine which would dispense coins against a debit to the customer's bank account using Unified Payments Interface (UPI).
- It was launched in collaboration with a few top banks.
- Unlike a cash-based traditional Coin Vending Machine, the QCVM would eliminate the need for physical tendering of banknotes and their authentication.
- Customers will also have the option to withdraw coins in the required quantity and denominations in QCVMs.
- The pilot project is planned to be initially rolled out at 19 locations in 12 cities across the country.
- These vending machines are intended to be installed at public places such as railway stations, shopping malls, marketplaces to enhance ease and accessibility
- Based on the learnings from the pilot tests, guidelines would be issued to banks to promote better distribution of coins using QCVMs.

Jantri or Annual Statement of Rates (ASR)

Why in News

Recently, the Gujarat government announced a 100 percent hike in jantri rates – ready reckoner rates applicable to any property bought or sold across the state – with immediate effect from February 4.

Important Points

Jantri

- Jantri or Annual Statement of Rates (ASR) is a minimum rate fixed by state governments for registration of any real estate property that undergoes a change in ownership.
- These rates differ between cities. Even within localities, jantri rates may differ based on property type (residential, commercial, institutional), location, size of property, and various other factors.
- When an old or existing property is bought by a new owner, it has to be registered as per the jantri or the market (selling) price, whichever is higher.
- As the name, ASR, suggests, jantri rates can change annually but were last hiked in April 2011.
- Then on February 4, the revenue department under Chief Minister Bhupendra Patel – who was earlier associated with the construction business himself – issued a resolution to hike the jantri rates by 100 per cent, to come into effect from the next day.
- By hiking the jantri, or, as other states call it, the circle of rates, the state government will collect more revenue through stamp duty and registration charges.
- Also, the move is expected to curb black money in the real estate sector, by bridging the gap between jantri rates and the actual market price of a property.

- Land and property owners usually quote prices higher than the jantri rates, thus earning more.
- The ASR is an essential guideline for the assessment of stamp duty, which is charged on the agreement of sale of a property.
- It also enables to indicate the property prices for every location or a specified area within an administrative boundary.

Upnext India under Market Access Initiative (MAI) Scheme

Why in News

Chairman Apparel Export Promotion Council (AEPC) along with the other Export Council (EC) members inaugurated the first edition of upnext India 2023 in presence of international buyers and exhibitors, at Apparel House, Gurugram.

Important Points

What is upnext India 2023?

- This initiative in the form of a series of Reverse Buyer Seller meet under the name of "UPNEXT INDIA" kick started with Japan.
- Upnext India is organized by AEPC and supported by the Ministry of Commerce and Industry under the Market Access Initiative (MAI) Scheme.
- 84 prominent Japanese buyers including trading companies and retail chains/ stores are in India to source their requirement from the 112 odd Indian exhibitors which are displaying the diverse range of RMG reflecting Japanese taste.

Market Access Initiative (MAI) Scheme

- It is an Export Promotion Scheme envisaged to act as a catalyst to promote India's exports on a sustained basis.
- The scheme is formulated on focus product-focus country approach to evolve specific market and specific product through market studies/survey.
- Assistance would be provided to Export Promotion Organizations/Trade Promotion Organizations/ National Level Institutions/ Research Institutions/Universities/Laboratories, Exporters etc., for enhancement of exports through accessing new markets or through increasing the share in the existing markets.
- Under the Scheme the level of assistance for each eligible activities has been fixed.

The following activities are eligible for financial assistance under the Scheme:

- Marketing Projects Abroad.
- Capacity Building.
- Support for Statutory Compliances.
- Studies.
- Project Development.
- Developing Foreign Trade Facilitation web Portal.
- To support Cottage and handicrafts units.

I-T survey

Why in News

Recently, the Income Tax (I-T) Department has conducted surveys at the premises of the British Broadcasting Corporation (BBC) in Delhi and Mumbai.

Important Points

- The surveys at the BBC's offices were carried out under various provisions of the I-T Act, 1961, such as Section 133A, which gives the I-T Department the power to carry out "surveys" to collect hidden information.
- The provision for surveys was incorporated into the Act through an amendment carried out in 1964.
- Section 133A allows an authorised officer to enter any place of business or profession or charitable activity within their jurisdiction to verify the books of account or other documents, cash, stock, or other valuable article or thing, which may be useful for or relevant to any proceeding under the Act.
- An I-T authority may, during the survey, make an inventory of any cash, stock, or other valuables; it may record the statements of anyone, or place marks of identification on the books and documents, or take their extracts or copies.
- The I-T authority may also "impound and retain any books of account or other documents after recording reasons for doing so".
- However, to retain such books for more than 15 days (excluding holidays), prior approval of a senior officer, including the Principal Chief Commissioner or Chief Commissioner or Principal Director General or Director General or Principal Commissioner or Commissioner, must be obtained.
- The provisions for impounding or seizing the goods were introduced only by the Finance Act, 2002.

What is an I-T "search"?

- A "search" typically refers to what is called a "raid", although the word 'raid' has not been defined anywhere in the Income-Tax Act. However, "search" has been defined under Section 132 of the Act.
- Under this Section, the I-T Department can carry out a process of inspection by entering and searching any building where it has reasons to believe someone is in possession of undisclosed income or property like money, bullion, gold.
- An I-T search can even be carried out when "any person to whom a summons or notice…has been or might be issued will not, or would not, produce or cause to be produced, any books of account or other documents which will be useful for, or relevant to, any proceeding" under the Act.
- The Act says that during a search, any authorized officer including the Deputy Director of Inspection, Inspecting Assistant Commissioner, Assistant Director of Inspection, or Income-tax Officer can:

- Enter and search any building or place where he has reason to suspect that such books of account, other documents, money, bullion, jewelry, or other valuable article or thing are kept.
- Break open the lock of any door, box, locker, safe, almirah, or other receptacles for exercising the powers conferred by clause (i) where the keys thereof are not available.
- Seize any such books of account, other documents, money, bullion, jewelry, or other valuable article or thing found as a result of such search.
- Place marks of identification on any books of account or other documents or make or cause to be made extracts or copies therefrom.
- Make a note or an inventory of any such money, bullion, jewelry, or other valuable article or thing.

The difference between a "search" and a "survey" then

- While in common parlance, people often use these two words (and also "raid") interchangeably, they are defined differently, and they denote different things.
- Broadly speaking, a search is a more serious proceeding than a survey, with larger consequences.
- Search, as defined under Section 132, can take place anywhere within the jurisdiction of the authorized officer.
- A survey under Section 133A(1) can only be conducted within the limits of the area assigned to the officer — or at any place occupied by any person in respect of whom he exercises jurisdiction — at which a business or profession, or an activity for a charitable purpose, is carried on.
- Also, surveys can be carried out only during working hours on business days, whereas a search can happen on any day after sunrise and continue until the procedures are completed.
- Finally, while the scope of a survey is limited to the inspection of books and verification of cash and inventory, in a search, the entire premises can be inspected to unravel undisclosed assets, with the help of police.

Trustees of mutual funds

Why in News

Securities and Exchange Board of India (SEBI) recently proposed to review the role and accountability of trustees of mutual funds with an aim to protect unitholders' interests.

Important Points

Recommendations of SEBI

- SEBI has recommended that the trustees will be responsible for taking steps so that there are system -level checks in place to prevent fraudulent transactions.
- To ensure that they focus on their core responsibilities, SEBI has proposed that the trustees should take help of audit, legal firms and merchant bankers for carrying out due diligence on their behalf.
- It has also recommended amending certain regulations for asset management companies (AMC)and also include additional clauses to enhance the role, responsibility and accountability of the board of AMC.
- The markets regulator also proposed the constitution of a 'Unit Holder Protection Committee' (UHPC) by board of AMC.
- This will help in an independent review mechanism for the decisions of AMC from the perspective of the unit holders' interest, across all products and services.
- In order to strengthen governance and for financial independence, Sebi also suggested that all the existing trustees with board of trustees structure should convert into a trustee company in the next one year.
- According to Sebi, though mutual fund regulations provide for some restrictions to address few conflicts of interest, there are some areas where the Trustees need to pay attention.
- Some of the potential conflicts include investment by mutual fund (MF) schemes in public issues of its sponsor, its associates and/or group companies; investment by MF schemes for fund raising activates by such companies where its sponsor, associates or group companies are appointed as merchant banker; sponsor influencing voting by MF schemes in companies in which it has interest and MF availing services of its sponsor, associates and group companies at terms which are not at arm's length.

- Besides, the regulators also put forward some recommendations to enhance the accountability of the board of asset management companies (AMC).

About Mutual Fund Trustees

- Mutual funds in India have a three-tiered structure – mutual fund, the trustees and the AMC.
- Board of trustees or trustee company holds the property of the mutual fund in trust for the benefit of the unit holders.
- They appoint an AMC to float schemes for the mutual fund and manage the funds mobilised under various schemes.
- They are also expected to exercise supervisory oversight over AMC and its activities so as to ensure that AMC acts in the interest of the unitholders.
- Once these recommendation are finalised, the trustees will ensure that the AMCs act in a manner which is not skewed in favour of AMC's stakeholders.
- The key areas of their focus will be fairness of fees and expenses charged by the AMC and misconduct including market abuse / misuse of information by the AMC or AMC employees or distributors.
- The trustees will ensure that there is no mis-selling of mutual fund schemes to increase asset under management (AUM) and valuation of the AMC.

Payment aggregators

Why in News

The payments arm of big technology companies Amazon and Google are among 32 firms that have been given in-principle approval by the Reserve Bank of India (RBI) to operate as online payment aggregators.

Important Points

- Apart from Amazon and Google, approvals have also been granted to Reliance Payment Solutions, a part of Reliance Jio Infocomm, and the payments platform of food delivery firm Zomato.
- The RBI has for the first time released a full list of the entities to which it has granted a payment aggregator licence, as well as those whose applications are still in process, and those whose applications it has rejected.

Who are payment aggregators?

- Online payment aggregators can onboard digital merchants and accept payments on their behalf after getting a licence from the RBI.
- The central bank introduced a framework for such entities in March 2020.
- Under the payment aggregator framework, only firms approved by the RBI can acquire and offer payment services to merchants, which brings them under the direct purview of the regulator.
- According to RBI rules, a company applying for aggregator authorisation must have a minimum net worth of Rs 15 crore in the first year of application, and at least Rs 25 crore by the second year.
- It also must fulfil the "fit and proper" criteria, and be compliant with global payment security standards.

Other action is RBI taking to regulate fintech firms

- The RBI has prepared a "white-list" of digital lending apps in the country, which it might soon release.
- In order to curb rising malpractices in the digital lending ecosystem, the RBI in August 2022 issued guidelines for entities engaged in digital lending that stated that all digital loans must be disbursed and repaid through bank accounts of regulated entities only, without the pass-through of lending service providers (LSPs) or other third parties.
- In a fresh set of clarifications issued on these norms, the regulator said that digital lenders should, at the time of sanction of loan, convey the name and other details of empanelled recovery agents authorised to contact the borrower in case of default.

The transfer pricing rules

Why in News

The governemt sources said that IT surveys at the premises of the BBC in Delhi and Mumbai recently were conducted in view of the BBC's deliberate non-compliance with the transfer pricing rules and its vast diversion of profits.

Important Points

What is transfer pricing?

- A party may transfer goods or services to another party for a price, which is known as a "transfer price".
- However, commercial transactions between different parts of a multinational group may not be subject to the same market forces that shape the relations between two independent firms.
- According to the I-T Department, "transfer pricing generally refers to prices of transactions between associated enterprises which may take place under conditions differing from those taking place between independent enterprises".
- Transfer pricing refers to the value attached to transfers of goods, services, and technology between related entities, and between unrelated parties that are controlled by a common entity.

How does transfer pricing work?

- Suppose a company A purchases goods for 100 rupees and sells it to its associated company B in another country for 200 rupees, who in turn sells in the open market for 400 rupees.
- Had A sold it (the good) direct, it would have made a profit of 300 rupees. But by routing it through B, it (A) restricted it (profit) to 100 rupees, permitting B to appropriate the balance.
- The transaction between A and B is arranged and not governed by market forces. The profit of 200 rupees is, thereby, shifted to the country of B.
- The goods is transferred on a price (transfer price) which is arbitrary or dictated (200 hundred rupees), but not on the market price (400 rupees).

Effects of transfer pricing

- The effect of transfer pricing is that the parent company or a specific subsidiary tends to produce insufficient taxable income or excessive loss on a transaction.
- For instance, profits accruing to the parent can be increased by setting high transfer prices to siphon profits from subsidiaries domiciled in high-tax countries, and low transfer prices to move profits to subsidiaries located in low-tax jurisdiction.
- As an example of this, a group which manufactures products in a high-tax country may decide to sell them at a low profit to its affiliate sales company based in a tax haven country.
- That company would in turn sell the product at an arm's length price, and the resulting (inflated) profit would be subject to little or no tax in that country. The result is revenue loss and also a drain on foreign exchange reserves.

What is the "arm's length arrangement" that the BBC has allegedly violated?

- Section 92F(ii) of the Income Tax Act, 1961 defines arm's length price as "a price which is applied or proposed to be applied in a transaction between persons other than associated enterprises, in uncontrolled conditions".
- Section 92C(1) says arm's length shall be determined by the "most appropriate" among the following methods:
    1. Comparable uncontrolled price method.
    2. Resale price method.
    3. Cost plus method,
    4. Profit split method.
    5. Transactional net margin method.
    6. Such other method as may be prescribed by the Board.

Perpetual funds

Why in News

The Securities and Exchange Board of India (Sebi) is deliberating on allowing permanent capital vehicles (PCVs), evergreen or perpetual funds, where the capital available is managed for an unlimited period of time, into India.

Important Points

What are perpetual funds?

- Perpetual funds do not have a fixed investment period. They continue until the time one wish to invest.
- These funds can potentially exist for perpetuity and are aimed at long-term investors such as pension funds and insurance firms which do not want return of capital but regular income.
- The funds could be structured in a way to give investors an option to redeem a certain portion of their investment after a 5, 10 or 15-year lock-in.
- PCVs can thus be considered as an alternative to private equity(PE) funds with limited life cycles.
- Several alternative investment funds (AIFs) in India have been facing an issue with fund extensions and have been unable to liquidate their investments within the given life cycle of the fund, which is typically 8-12 years.
- With India rapidly coming up the learning curve on private investment funds, it may be the best time to introduce PCVs in India.
- Unlike traditional funds which have a finite tenure, PCVs can have an open term with respect to the tenure and don't have a sunset period
- PCVs can be of various types, including limited partnerships traded publicly on an exchange, real estate investment trusts, closed-ended funds, interval funds and variable funds such as annuities and life insurance.
- In the Indian context, since Category I and II AIFs are permitted to launch close-ended schemes only, legally the concept of evergreen funds has not evolved in the country.

Rating of Buildings or Areas for Digital Connectivity

Why in News

The Telecom Regulatory Authority of India (TRAI) has recently released its recommendations on "Rating of Buildings or Areas for Digital Connectivity".

Important Points

- TRAI undertook the process of consultation on Suo-moto basis to provide a framework for establishment of an eco-system wherein Digital Connectivity Infrastructure becomes part of all development activities.
- TRAI issued Consultation Paper (CP) on "Rating of Buildings or Areas for Digital Connectivity" on 25th March 2022, to seek inputs from stakeholders on issues raised, by 07th July 2022.
- The emphasis of these recommendations is on providing a framework for creation of an ecosystem for Digital Connectivity Infrastructure (DCI) to be an intrinsic part of building development plan similar to other building services such as water, electricity or Fire Safety System.
- DCI is to be co-designed and cocreated along with building development through collaborations among various stakeholders including Property Managers (owner or developer or builder etc.), service providers, infrastructure providers, DCI Professionals and Authorities at various urban/local bodies.
- This framework shall also open job opportunities for the young professionals to become DCI Professionals and be part of Design, Deployment and Evaluation of Digital Connectivity Infrastructure.
- TRAI has also proposed a new chapter on 'Digital Connectivity Infrastructures in Buildings' to be included in Model Building Bye Laws 2016 by modifying and updating existing provisions added in MBBL as Annexure through an Addendum to Model Building Bye Laws 2016 titled "Provisions for In- Building Solutions Digital Communication Infrastructure" issued by Town and Country Planning Organization (TCPO) of Ministry of Housing and Urban Affairs (MoHUA), in March 2022.
- TRAI further emphasized that DCI developed in the Buildings by the Property Managers (Developers, Builders etc) should be accessible to all service providers in a fair, transparent, non-discriminatory and non-chargeable basis.
- The recommendations also include development of framework for Rating of the buildings for digital connectivity, which will add value to the property.
- TRAI will come up, separately, with appropriate regulatory framework for Rating of Buildings, which will also include the issue of Rating certification.

Chapter-
5

SCIENCE AND TECHNOLOGY

Lab-grown diamonds

Why in News

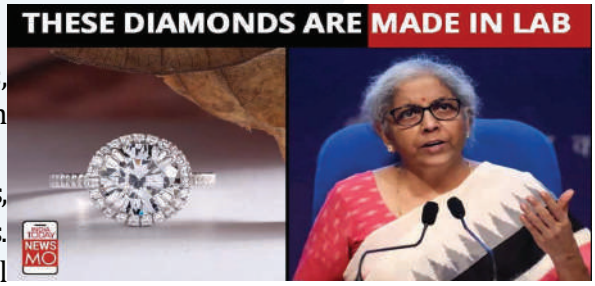
During her Budget speech (2023), Finance Minister Nirmala Sitharaman announced the government's move to focus on lab-grown diamonds.

Important Points

About Lab-Grown Diamonds(LGDs)

- Lab-grown diamonds are diamonds that are produced using specific technology which mimics the geological processes that grow natural diamonds.
- They are not the same as "diamond simulants" – LGDs are chemically, physically and optically diamond and thus are difficult to identify as "lab-grown."
- While materials such as Moissanite, Cubic Zirconia (CZ), White Sapphire, YAG, etc. are "diamond simulants" that simply attempt to "look" like a diamond, they lack the sparkle and durability of a diamond and are thus easily identifiable.
- However, differentiating between an LGD and an Earth Mined Diamond is hard, with advanced equipment required for the purpose.
- There are multiple ways in which LGDs can be produced. The most common (and cheapest) is the "High pressure, high temperature" (HPHT) method.
- As the name suggests, this method requires extremely heavy presses that can produce up to 730,000 psi of pressure under extremely high temperatures (at least 1500 celsius).
- Usually graphite is used as the "diamond seed" and when subjected to these extreme conditions, the relatively inexpensive form of carbon turns into one of the most expensive carbon forms.
- Other processes include "Chemical Vapor Deposition" (CVD) and explosive formation that creates what are known as "detonation nanodiamonds".

Uses of LGDs



- LGDs have basic properties similar to natural diamonds, including their optical dispersion, which provide them the signature diamond sheen.
- However, since they are created in controlled environments, many of their properties can be enhanced for various purposes.
- For instance, LGDs are most often used for industrial purposes, in machines and tools. Their hardness and extra strength make them ideal for use as cutters.
- Furthermore, pure synthetic diamonds have high thermal conductivity, but negligible electrical conductivity. This combination is invaluable for electronics where such diamonds can be used as a heat spreader for high-power laser diodes, laser arrays and high-power transistors.
- Lastly, as the Earth's reserves of natural diamonds are depleted, LGDs are slowly replacing the prized gemstone in the jewelry industry.
- Crucially, like natural diamonds, LGDs undergo similar processes of polishing and cutting that are required to provide diamonds their characteristic lustre.
- Thus, growth in the production of LGDs is unlikely to affect India's established diamond industry which undertakes these tasks.

New announcements

- Finance Minister has announced that customs duty on the seeds used in lab-grown diamond manufacturing will be reduced.
- She also announced a grant to IITs to facilitate the growth of LGDs in India.

Radioactive capsule found in Australia

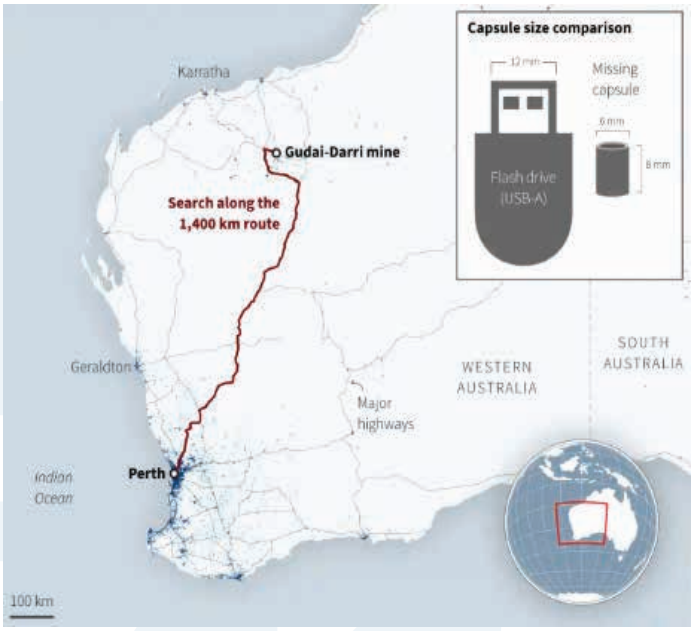
Why in News

Authorities in Austarlia have recovered a tiny radioactive capsule, smaller than a coin, lost in Country's vast Outback.

Important Points

About the capsule

- The Caesium-137 capsule lost in transit was discovered when a vehicle equipped with specialist detection equipment picked up the radiation, despite travelling at around 70 km/h.
- The search team then used portable detection equipment to find the capsule, which was located about 2 metres from the side of the road in a remote area far from any community.
- The radioactive capsule was part of a gauge used to measure the density of iron ore feed from Rio Tinto's Gudai-Darri mine.
- Located in the northern reaches of Western Australia, the recently opened mine is one of the most advanced in the world, with a high degree of automation.
- The biggest danger was that the capsule would be picked up by some unsuspecting person.
- This would not only endanger the person but potentially endanger their community as they went around, presumably with the capsule in their pocket.



- Radioactive materials like Caesium-137 produce beta and gamma radiation, both of which are harmful for humans.
- When exposed to them, short term risks include that of radiation poisoning (which can be deadly) whereas in the long term, it can also be a cause of cancer and damage human DNA.
- Radionuclides (or radioactive materials) are a class of chemicals where the nucleus of the atom is unstable.
- They achieve stability through changes in the nucleus (spontaneous fission, emission of alpha particles, or conversion of neutrons to protons or the reverse).
- This process is called radioactive decay or transformation, and often is followed by the release of ionizing radiation (beta particles, neutrons, or gamma rays).

Additional Surveillance Mechanism (ASM)

Why in News

The National Stock Exchange (NSE) has recently placed Adani Enterprises, Adani Ports, and Ambuja Cements under the additional surveillance mechanism (ASM).

Important Points

What is an additional surveillance mechanism (ASM)?

- The ASM was introduced on March 26, 2018 with the intention to protect investors from market volatility and unusual changes in share price.
- According to the National Stock Exchange (NSE), in continuation to various surveillance measures already implemented, SEBI and Exchanges, pursuant to discussions in joint surveillance meetings, have decided that along with the aforesaid measures there shall be Additional Surveillance Measures (ASM) on securities with surveillance concerns based on objective parameters viz. Price / Volume variation, Volatility etc.

- It means trading in their shares will require a 100% margin, which is aimed at curbing speculation and short selling.
- The shortlisting of securities for placing in ASM is based on criteria that are jointly decided by the SEBI and exchanges, covering the parameters of "high low variation, client concentration, PE, close to close price variation, market capitalisation, volume variation, delivery percentage, and number of unique PANs.
- Put simply, an ASM shortlisting signals to investors that the stocks have seen unusual activity.
- The shortlisting of securities under ASM is purely on account of market surveillance and it should not be construed as an adverse action against the concerned company / entity.

Researchers find a new way to improve the storage time of quantum information

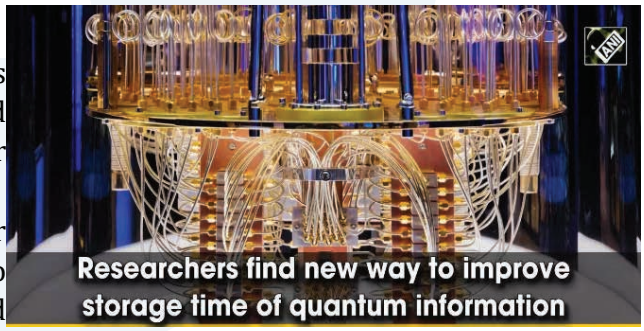
Why in News

An international team of scientists has made a breakthrough in retaining the quantum coherence of quantum dot spin qubits.

Important Points

- These new technologies will alter a wide range of enterprises and research initiatives, from information security to the search for novel materials and chemicals, to measurements of fundamental physical processes requiring exact temporal synchronisation among the sensors.
- Spin-photon interfaces are elementary building blocks for quantum networks that allow converting stationary quantum information (such as the quantum state of an ion or a solid-state spin qubit) into light, namely photons, that can be distributed over large distances.
- A major challenge is to find an interface that is both good at storing quantum information and efficient at converting it into light.
- Optically active semiconductor quantum dots are the most efficient spin-photon interface known to date but extending their storage time beyond a few microseconds has puzzled physicists in spite of decade-long research efforts.

What are Quantum Dots (QDs)?



- Quantum dots (QDs) are semiconductor particles a few nanometres in size, having optical and electronic properties that differ from those of larger particles as a result of quantum mechanics.
- The size of the QDs is orders of magnitude larger than a typical atomic radius, yet small enough to provide quantum confinement of electrons and holes in all three spatial dimensions.
- They are a central topic in nanotechnology and materials science.
- When the quantum dots are illuminated by UV light, an electron in the quantum dot can be excited to a state of higher energy.
- In the case of a semiconducting quantum dot, this process corresponds to the transition of an electron from the valence band to the conductance band.
- The excited electron can drop back into the valence band releasing its energy as light. This light emission (photoluminescence) is illustrated in the figure on the right.
- The colour of that light depends on the energy difference between the conductance band and the valence band, or the transition between discrete energy states when the band structure is no longer well-defined in QDs.

Macrosomia

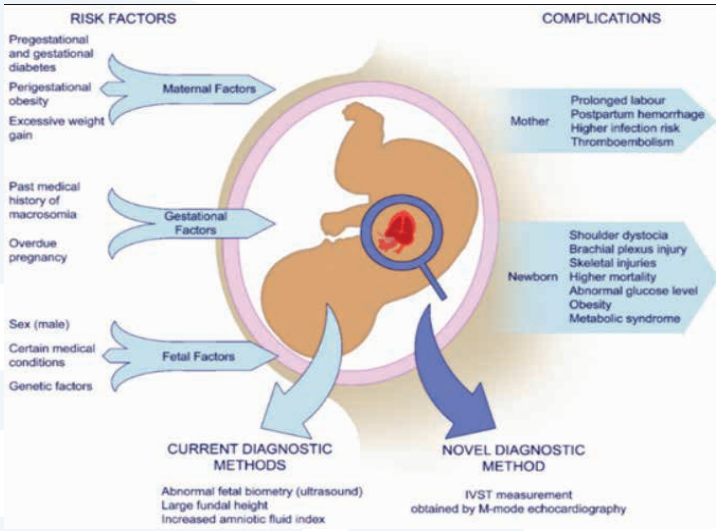
Why in News

A mother in Brazil recently gave birth to a two-foot-tall baby weighing 16lb (7.3kg). The term used to describe these giant babies is macrosomia (Greek for large body)

Important Points

What is macrosomia?

- Any baby that weighs more than 4kg, regardless of its gestational age, is said to have macrosomia.
- Babies with macrosomia account for about 12 percent of births.
- One thing we don't know about macrosomic babies is whether they stay bigger throughout life.
- The limited data there does exist suggest that they are more likely to be overweight or obese by the age of seven and are also more likely to develop type 2 diabetes in later life.
- The newly born baby eclipsed the heaviest baby girl on record, who was 15lb (6.8kg) when she was born in 2016, but neither come close to the heaviest baby on record, who tipped the scales at a whopping 22lb 8oz (10.2kg), in Italy in 1955.
- To put this in perspective, newborn boys typically weigh 3.3kg and girls 3.2kg.



Factors responsible for such births

- In mothers with gestational diabetes (high blood sugar that arises during pregnancy), this increases to between 15 per cent and 45 percent of births.
- Certain factors increase the risk of a mother giving birth to a giant baby – one of them being body weight.
- Obese mothers are twice as likely to have a newborn with macrosomia. And excessive weight gain during pregnancy likewise increases the risk of macrosomia.
- Gestational diabetes is a risk factor, too. Some of it is linked to an increase in insulin resistance in the mother during pregnancy (even in those without gestational diabetes), which increases the amount of glucose that travels across the placenta to the foetus, helping the foetus to grow excessively.
- The condition also helps lipids (fats) to enter the placenta, providing the baby with more fuel for growth.
- Being older when pregnant also increases the odds of having a baby with macrosomia.
- A maternal age greater than 35 makes it 20 per cent more likely that the baby will have macrosomia. The father's age counts, too. A paternal age greater than 35 increases the risk of macrosomia by 10 per cent.
- Previous pregnancies increase the risk of macrosomia because with each successive pregnancy, birth weight increases.
- Overdue pregnancies – those that run past the typical 40 weeks – also increase the risk of a baby being macrosomic, particularly at 42 weeks or more.
- Having a boy increases the likelihood of macrosomia. Boys are three times more likely than girls to be born macrosomic.

Concerns

- Babies with macrosomia are more likely to encounter difficulties moving through the birth canal because of their large size.
- For example, it is quite common for the baby's shoulder to get caught behind the mother's pubic bone. The medical term for this is "shoulder dystocia".
- While the baby is stuck, it cannot breathe and the umbilical cord may be squeezed.

- It can also cause the baby's collarbones to break or damage the brachial plexus nerves that supply the arms – in the most severe cases, this damage can be permanent.
- Shoulder dystocia occurs in about 0.7 per cent of all births, but in macrosomic babies, the incidence is about 25 per cent.
- Mothers are also at increased risk of vaginal tear during delivery, which then increases the risk of postpartum haemorrhage (bleeding).
- Postpartum haemorrhage is the leading cause of maternal death worldwide, and hence the larger the baby, the greater the risk of damage during normal vaginal delivery.
- Macrosomia of newborns also leads to an increased risk of a prolonged second phase of labour, which is when the cervix is fully dilated and the baby's head moves into the vagina.
- Due to the size of macrosomic babies, this movement can be slower than usual which can increase the risk of the mother suffering from infection, urinary retention and haematoma (internal bleeding).

Union Budget's 'Digital India' push

Why in News

The Union Budget speech by the Finance Minister highlighted the government's continuous efforts to push for digitisation in the country.

Important Points

Initiatives for Digital India push

- From building a digital library for children and adolescents to formulating a National Data Governance policy, the minister announced a wide range of schemes and proposals during her address. They are:

Digital Public Infrastructure for Agriculture:

- It will be an open source, open standard and interoperable public good.
- The platform will offer inclusive, farmer-centric solutions through relevant information services for crop planning and health, improved access to farm inputs, credit, and insurance, help for crop estimation, market intelligence, and support for the growth of the agri-tech industry and start-ups.

National Digital Library for Children and Adolescents:

- This will be established for facilitating the availability of quality books in different languages, genres and at different levels.
- The government will also try to inculcate a culture of reading by collaborating with NGOs, which will provide age-appropriate reading material to everyone.
- The National Book Trust and Children's Book Trust will also step in and the library would be "device -agnostic".

Centres of Excellence for Artificial Intelligence:

- There is a proposal for setting up three centres of excellence for Artificial Intelligence in top educational institutions.
- These centres, in partnership with leading players in the industry, will conduct interdisciplinary research and develop cutting-edge applications and scalable problem solutions in the areas of agriculture, health, and sustainable cities.

National Data Governance Policy:

- Government will formulate a data governance policy to enable access to anonymised data for innovation and research by start-ups and academia.

Other initiatives

- 5G Services: A hundred labs will be established in engineering institutions for developing applications using 5G services to realise a new range of opportunities, business models, and employment potential.
- E-Courts: Government will roll out phase three of the E-Courts project to ensure the efficient administration of justice.
- Bharat Shared Repository of Inscriptions (Bharat SHRI): A digital epigraphy museum will be established and one lakh ancient inscriptions will be digitised in the first stage.
- Skill India Digital Platform: The digital ecosystem for skilling will be further expanded by launching a unified Skill India Digital platform for enabling demand-based formal skilling, linking with employers including MSMEs and facilitating access to entrepreneurship schemes.

Mission to eliminate sickle cell anaemia by 2047

Why in News

The Union Finance Minister has announced her government's plan to launch a mission to eliminate sickle cell anaemia by 2047.

Important Points

About the mission

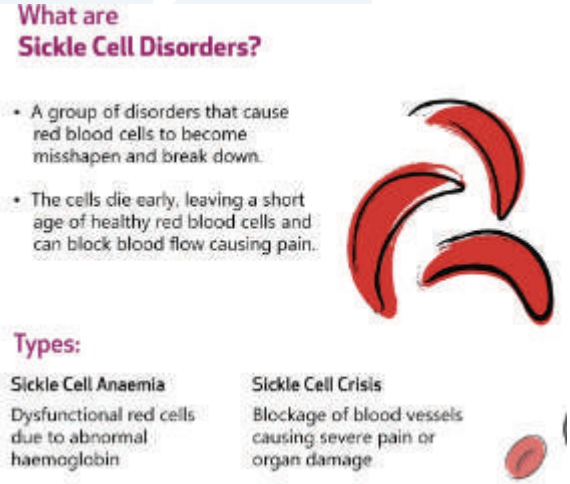
It will entail awareness creation, universal screening of seven crore people in the age group of 0-40 years in affected tribal areas and counselling through collaborative efforts of central ministries and state governments.

What is Sickle cell disease (SCD)?

- It is an inherited group of blood disorders that is genetic in nature.
- It is usually transferred from the parents to the child during birth i.e. both parents can be carriers of SCDs.
- The infection turns the RBCs from round flexible discs into stiff and sticky sickled cells.
- As a result, the blood doesn't have enough red blood cells anymore and the affected person develops anemia, a condition when your body is not able to carry adequate oxygen to the tissues.
- The sickle cells die prematurely, resulting in a chronic lack of red blood cells.
- Furthermore, as they pass through small blood arteries, they become caught and obstruct the blood flow.
- This can result in discomfort as well as other dangerous consequences (health issues) such as infection, acute chest syndrome, and stroke.
- Babies with sickle cell anaemia may not exhibit symptoms for several months after birth.
- The symptoms of anaemia, however, include excessive weariness or fussiness, excruciatingly swollen hands and feet, and jaundice.
- Babies may also suffer spleen damage, which weakens their immune system and increases their susceptibility to bacterial infections.
- People with sickle cell anaemia may have various and increasingly significant medical problems as they age, which occur when organ tissues do not receive enough oxygen.

Diagnosing sickle cell disease

- A blood test can determine whether you have SCD or sickle cell trait.
- People who are considering having children can get the test to determine the likelihood of their offspring having SCD.
- SCD can also be diagnosed before a baby is born. A sample of amniotic fluid (the fluids in the sac around the foetus) or placental tissue is used in this test (the organ that brings oxygen and nutrients to the baby).



Treatment therapies

- SCD can only be cured by bone marrow or stem cell transplantation.
- These transplants are normally reserved for children with severe SCD since they are hazardous and can have substantial adverse effects.
- The bone marrow must be a close match for the transplant to succeed. A brother or sister is usually the ideal donor.

Mechanisms of the toxic action of cobra venom traced

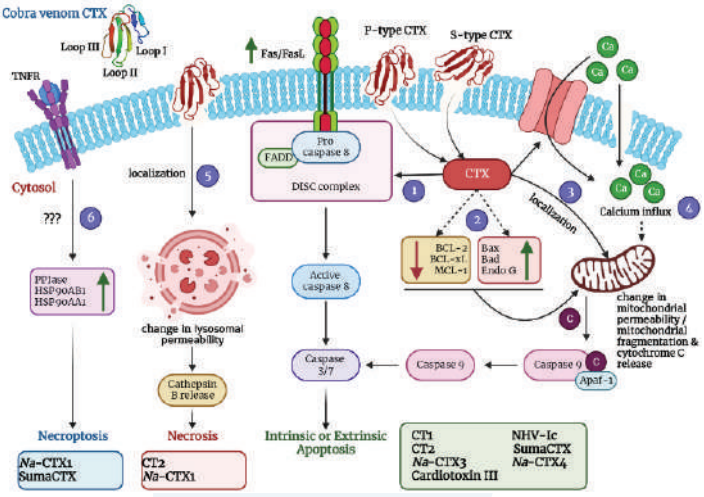
Why in News

Scientists have traced the mechanisms of the toxic action of cobra venom, paving a path towards developing strategies for application of antivenom or small molecule inhibitors, which can help mitigate the local toxic effects of cobra venom retained at the bite site.

Important Points

- Cobras (genus Naja) are widely distributed over Asia and Africa, and cobra bites are responsible for large mortality and morbidity on these continents, including the Indian sub-continent.

- Like other elapid venoms, cobra venoms are neurotoxic in nature. However, they also exhibit local cytotoxic effects at the envenomed site, and the extent of cytotoxicity may vary from species to species.
- Proteomic studies from several other laboratories have demonstrated that cobra venoms are predominated by the non-enzymatic three-finger toxin family, constituting about 60-75% of the total venom.
- Cytotoxins (CTXs), an essential class of the non-enzymatic three-finger toxin family, are ubiquitously present in cobra venoms.
- These low-molecular-mass toxins, contributing to about 40 to 60% of the cobra venom proteome, play a significant role in cobra venom-induced toxicity, more prominently in dermonecrosis (local effects).
- Some CTXs are also responsible for depolarizing neurons and heart muscle membranes, thereby contributing to cardiac failures frequently observed in cobra-envenomed victims.
- Consequently, they are also known as cardiotoxins (CdTx). Interestingly, the proportion of cobra venom CTXs varies dramatically across different Naja species.
- Usually, venoms from African spitting cobras have a higher proportion of CTXs than the Asiatic cobra ones, indicating geographical variation in snake venom composition.
- A recent study led by Prof. Mukherjee, Director of the Institute of Advanced Study in Science and Technology (IASST), Guwahati, an autonomous institute of the Department of Science and Technology and his collaborators from the Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Russian Academy of Sciences, Moscow, and from Amrita Vishwa Vidyapeetham, Kochi, have comprehensively discussed the mechanisms of action of cobra venom CTXs and highlighted their significance in cobra venom-induced pathophysiology and toxicity.



- Furthermore, this collaborative study shed light on the efficacy of commercial antivenoms in mitigating the toxic effects of this significant class of cobra toxins.
- Prof. Mukherjee emphasized that being low-molecular-mass toxins, cobra venom CTXs induce low immune responses during the traditional production of antivenoms. Therefore, commercial antivenoms lack sufficient antibodies to neutralize these cobra venom toxins.
- Dr. Mukherjee added that due to this sub-optimal performance of commercial antivenoms against cobra venom CTXs, in-patient hospital management of local effects prevalent in cobra-envenomation is challenging and still a grave concern that requires immediate attention.
- The authors believe that the recent advances in molecular biology and protein engineering can significantly facilitate the solution to this problem and aid in creating highly immunogenic toxins/toxin fragments for antivenom production.
- Moreover, they suggested that developing strategies for topical application of antivenom (small antibodies, e.g., VHH or nanobodies) or small molecule inhibitors may be a more effective alternative to mitigate the local toxic effects of cobra venom CTXs retained at the bite site.

The medium-density amorphous ice

Why in News

Scientists have created a new type of ice that matches the density and structure of water, perhaps opening a door to studying water's mysterious properties.

Important Points

About the new type of ice

- The ice is called medium-density amorphous ice.
- The team that created it, led by Alexander Rosu-Finsen at University College London (UCL), shook

regular ice in a small container with centimetre-wide stainless-steel balls at temperatures of (–) 200 °C to produce the variant, which has never been seen before.

- The ice appeared as a white granular powder that stuck to the metal balls.
- Normally, when water freezes, it crystallizes and its molecules are arranged into the familiar hexagonal, solid structure that we call ice.

- Ice is less dense than its liquid form, an unusual property for a crystal.
- Depending on conditions such as pressure and the speed of freezing, water can also solidify in any of two dozen other regular arrangements. Amorphous ice is different: it has no such order.
- Unlike the crystalline ice that forms naturally on Earth, the newly created ice doesn't have an organized molecular structure.
- Instead, its molecules are in a chaotic mismatch, more like glass — a state known as amorphous.
- Other types of amorphous ice have been made before, but they've been either much less dense or far denser than liquid water.
- This new Goldilocks version of amorphous ice is right in the middle, almost exactly matching liquid water's density.
- If confirmed, the new form of ice could enable studies of water in a manner that was not possible before.

Muons to study the fortress wall of Xi'an, an ancient city in China

Why in News

As per a new study, researchers are examining the fortress wall of Xi'an, an ancient city in China, by using tiny outer space particles called muons that can penetrate hundreds of metres of stone surfaces.

Important Points

- The study titled as 'High-precision muography in archaeogeophysics: A case study on Xi'an defensive walls', has been conducted by a team of scientists from Lanzhou University, China, and China Institute of Atomic Energy.
- Xi'an's wall is 12 metres high and 18 metres thick. To analyse this 14 kilometres long rampart, researchers deployed a technique called muon tomography or muography, which uses muons to generate three-dimensional images of such large structures.

- These particles have helped them find small density anomalies, which are potential safety hazards, inside the wall.
- Although muon tomography was first used in the 1960s, it has only recently found widespread utilisation among researchers, particularly in the field of archaeology.
- With unique advantages, muography has gained increasing attention from archaeologists as a novel and innovative tool to investigate large-scale archaeological sites.
- This approach may be especially helpful for identifying endangered cultural relics and monuments.

What are muons?

- Muons are subatomic particles raining from space.
- They are created when the particles in Earth's atmosphere collide with cosmic rays — clusters of high-energy particles that move through space at just below the speed of light.
- About 10,000 muons reach every square metre of the Earth's surface a minute.
- These particles resemble electrons but are 207 times as massive. Therefore, they are sometimes called "fat electrons".

- Because muons are so heavy, they can travel through hundreds of metres of rock or other matter before getting absorbed or decaying into electrons and neutrinos.
- In comparison, electrons can penetrate through only a few centimetres. Muons are highly unstable and exist for just 2.2 microseconds.

What is muon tomography or muography?

- Muography is conceptually similar to X-ray but capable of scanning much larger and wider structures, owing to the penetration power of muons.
- As these high-energy particles are naturally produced and ubiquitous, all one needs to do is place a muon detector underneath, within or near the object of interest.
- The detector then tracks the number of muons going through the object from different directions, to form a three-dimensional image.
- The image is then compared with a muon image of the "free sky." This indicates how many muons have been blocked.
- The final picture is essentially a shadow of the object, in the light of cosmic muons.

Muons and archaeology

- The technique was first used in the late 1960s, when Nobel Laureate and US experimental physicist Luis Alvarez joined hands with Egyptologists to search for hidden chambers in the Pyramid of Khafre, Giza. Nothing was found at the time.
- However, in 2017, modern archaeologists repeated the experiment with more sophisticated and advanced muon detectors and stumbled upon a major finding.
- By placing several detectors in the queen's chamber and in an adjacent corridor within the pyramid and at its base on the north side, the archaeologists were able to discover a previously unknown chamber at least 30 metres long.
- It was the first major inner structure to be found in the pyramid since the 19th century.
- Much like the 2017 experiment, scientists of the latest study also used a muon detector, called CORMIS (Cosmic Ray Muon Imaging System), to examine the wall of Xi'an city.
- To collect enough data for scanning the whole structure, they deployed six detectors for a week at a time.
- The survey data are carefully processed with advanced statistical methods newly introduced in muography, and the results indicate density anomalies inside the rampart with unprecedented levels of precision.

Uses of muography beyond archaeology

- Apart from archaeology, muography has found use in customs security, internal imaging of volcanoes and others.
- Around 2015, scientists used the technique to look inside the Fukushima nuclear reactors after the 2011 earthquake and tsunami in Japan.
- As the site was highly radioactive, they put the two muon detectors in 10 centimetres thick boxes to protect them from radiation and then carried out the scanning.
- Muography is also being used by researchers to analyse Mount Vesuvius, a volcano in Italy.
- According to a 2022 study, with the help of this technique, researchers are trying to understand the finer details of the volcano's internal structure.

ChatGPT vs google's Bard

Why in News

Google has confirmed that it will soon start public testing for a new AI chatbot of its own called Bard, based on the company's Language Model for Dialogue Application or LaMDA.

Important Points

What is Bard?

- Bard is based on LaMDA and Google's own conversational AI chatbot.
- Google will be opening it up to trusted testers ahead of making it more widely available to the public in the coming days.

- According to Google, Bard "draws on information from the web to provide fresh, high-quality responses."
- In short, it will give in-depth, conversational and essay-style answers just like ChatGPT does right now.
- A user will be able to ask Bard "to explain new discoveries from NASA's James Webb Space Telescope to a 9-year-old, or learn more about the best strikers in football right now, and then get drills to build your skills,"
- However, Google has also said that the model is currently a "lightweight" version of LaMDA, and the one being "requires significantly less computing power, enabling us to scale to more users, allowing for more feedback." Remember running these models also requires significant computing power.

What is LaMDA?

- LaMDA, which stands for Language Model for Dialogue Applications, is a family of conversational neural language models developed by Google. The first generation was announced during the 2021 Google I/O keynote, while the second generation was announced in 2022.

Comparison of Google's Bard with ChatGPT of Microsoft-backed OpenAI

- It appears that to take on ChatGPT, Google has an ace up its sleeve: the ability to draw information from the Internet. "It (Bard) draws on information from the web to provide fresh, high-quality responses," Google said in its blog post.
- ChatGPT has impressed with its ability to respond to complex queries — though with varying degrees of accuracy — but its biggest shortcoming perhaps is that it cannot access real-time information from the Internet.
- ChatGPT's language model was trained on a vast dataset to generate text based on the input, and the dataset, at the moment, only includes information until 2021.
- According to a demo shown by Google, it appears that for questions where there might not be a clear-cut answer, Bard will synthesise a response that reflects differing opinions.
- Bard looks like a limited rollout right now. Google is looking for a lot of feedback at the moment around Bard, so it is hard to say whether it can answer more questions than ChatGPT.
- Google has also not made clear the amount of knowledge that Bard possesses.
- For instance, with ChatGPT, we know its knowledge is limited to events till 2021. Of course, it is based on LaMDA, which has been in the news for a while now. Bard is also built on Transformer technology—which is also the backbone of ChatGPT and other AI bots. Transformer technology was pioneered by Google and made open-source in 2017.
- Transformer technology is a neural network architecture, which is capable of making predictions based on inputs and is primarily used in natural language processing and computer vision technology.

Microsoft's new Bing search

Why in News

Recently, Microsoft announced plans to integrate its Bing search with more artificial intelligence (AI) features, powered by a new and bigger language learning model (LLM) from OpenAI.

Important Points

About the new Bing search

- Based on what Microsoft showcased, Bing search will be more conversational and interactive, almost like a smart AI assistant, rather than just showcasing endless links – which is the case right now.
- Microsoft is calling the new Bing and Edge as users' AI copilot for the web as they are claimed to deliver better search, more complete answers, a new chat experience and the ability to generate content.
- Bing's new avatar will allow the search engine to give more conversational answers, in the form of essays and summaries which is based on consolidating reliable sources across the web.

- Bing's new chat experience will also write poems, and stories and even give tips on what to do in a particular city, all designed to make search seem more personalised.
- This is still a limited release and users have to sign up on the waitlist in order to get access. The Bing search experience once it starts rolling out will be available on the desktop and the respective apps.

Difference between new Bing search & ChatGPT

- Microsoft's Bing Search will continue to show links, even in those essay-style answers – the links are shown at the bottom of these answers.
- ChatGPT does not show links at the moment. But it would be fair to say Bing is getting a lot of help from OpenAI and the large language models (LLM) that helped create ChatGPT.
- LLM powering Bing is bigger than what is being used to run ChatGPT, though exactly how big is not specified.
- This also means Bing's AI chat will have more answers and a larger knowledge pool compared to ChatGPT – where the knowledge is limited to events before 2021.
- But Bing's AI chat experience will certainly make it feel more like ChatGPT. Users will be able to ask "follow-up questions," as well to their earlier question.
- The new AI features also apply what Microsoft is calling a "Prometheus model".
- Microsoft calls this a proprietary way of working with the OpenAI model that ensures it can utilise these language models in the best possible manner to give relevant, timely and targeted results.
- Microsoft has cautioned that not all answers will be accurate given these features are still in early preview.
- Bing search will also let users flag an answer as incorrect if needed which will help in feedback.

IEEE C-DOT Certified Telecom Expert Program (ICCTEP)

Why in News

The Secretary (Telecom), Government of India has launched the 'IEEE C-DOT Certified Telecom Expert Program (ICCTEP).

Important Points

About ICCTEP

- It was launched in collaboration with IEEE (Institute of Electrical and Electronics Engineers) and C-DOT (Centre for Development of Telematics).
- It seeks to bring learning in the areas of Telecom including 5G, Cyber Security and Quantum Communication to bridge the skill gap.
- This platform will offer a specially-tailored certification program that aims at providing quality learning in diverse areas of Telecom.
- The key focus is on building skills that would accelerate the participation of students, academia, technologists, industry, start-ups and other relevant stakeholders in developing globally-competitive Telecom technologies and solutions.
- The first program launched on the platform is on 5G and beyond.
- The aim of this collaboration is to jointly create telecommunication courses, promote and train students and professionals, create jobs opportunities, and bridge the digital divide.
- IEEE Blended Learning Program (BLP) aims to upskill young professionals in Wireless, Optical, Broadcasting, Telecom Validation & Security.
- This program was launched during the IEEE Standards Association (IEEE SA) Workshop centred on "Next Generation Connectivity".

BLP certification program

- The BLP certification program is developed in conjunction with industry leaders and vetted by experts to ensure their effectiveness in content and learning experience.
- It is backed by micro-learning modules, application modules, and data analytics, ultimately leading to a Joint certificate, which aims at bridging the skills gap.

IEEE

- IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.
- IEEE and its members inspire a global community through its highly cited publications, conferences, technology standards, and professional & educational activities.

C-DOT

- 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 various cutting-edge Telecom technologies including 4G/5G, Disaster Management, Cyber Security and Quantum Communications.

Chimeric antigen receptor (CAR) T-cell therapy

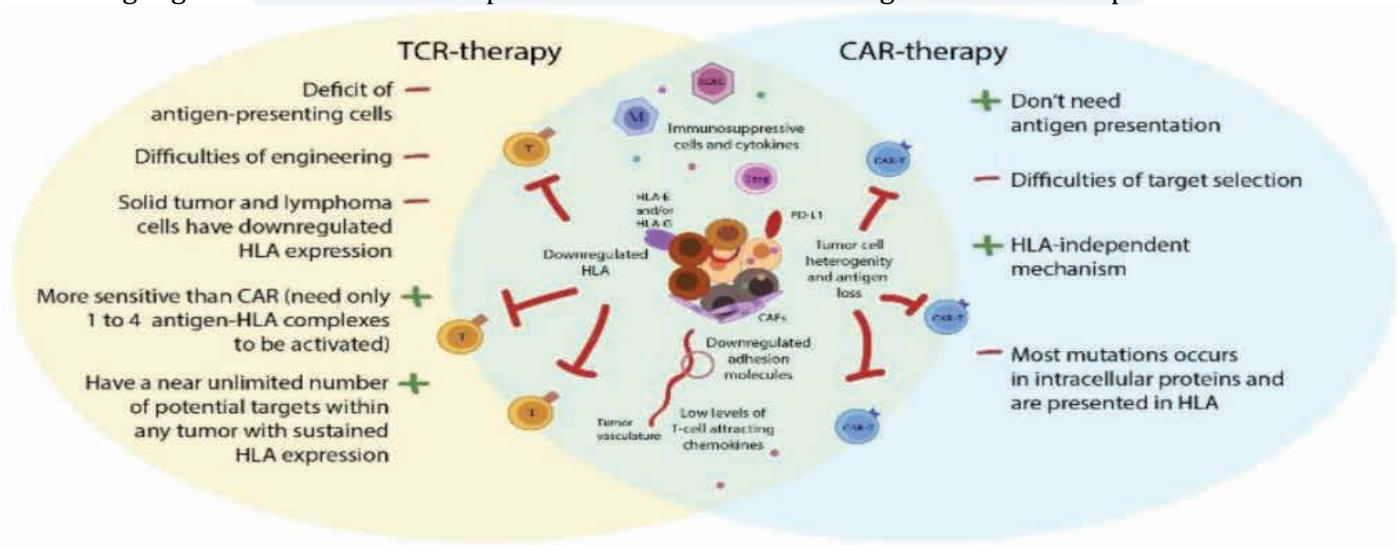
Why in News

Global data on the efficacy of CAR T-cell therapy for cancer looks very good.

Important Points

What is Chimeric antigen receptor (CAR) T-cell therapy?

- It is a way to get immune cells called T cells (a type of white blood cell) to fight cancer by changing them in the lab so they can find and destroy cancer cells.
- CAR T-cell therapy is also sometimes talked about as a type of cell-based gene therapy, because it involves altering the genes inside T cells to help them attack the cancer.
- This type of treatment can be very helpful in treating some types of cancer, even when other treatments are no longer working.
- CARs are recombinant receptors for antigens which redirect the specificity and function of T lymphocytes and/or other immune cells in a single molecule.
- The concept of using CARs in cancer immunotherapy is that CARs, which are programmed targeting tumor-associated antigens, can be replicated rapidly and homogeneously.
- Direct infusion of these armed tumor-targeting T-cells bypass the barriers and kinetics of active immunization.
- This activity describes the indications, contraindications, and complications of CART treatment and highlights the role of the interprofessional team in the management of cancer patients.



What are T-cells?

- T cell, also called T lymphocyte, a type of leukocyte (white blood cell) that is an essential part of the immune system.
- T cells are one of two primary types of lymphocytes—B cells being the second type—that determine the specificity of immune response to antigens (foreign substances) in the body.
- T cells originate in the bone marrow and mature in the thymus. In the thymus, T cells multiply and differentiate into helper, regulatory, or cytotoxic T cells or become memory T cells.

MicroLEDs

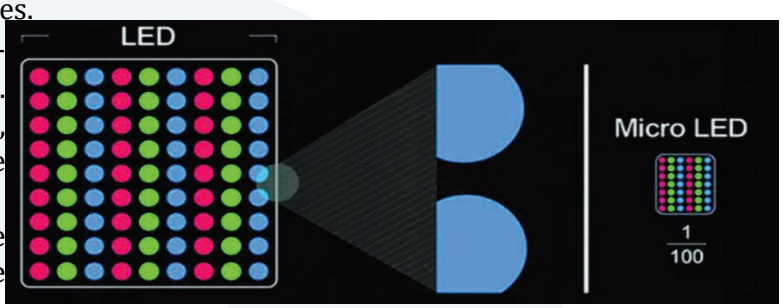
Why in News

Apple's shift to microLED display technology is reportedly under process.

Important Points

What is microLED display?

- MicroLEDs are self-illuminating diodes that have brighter and better colour reproduction than Organic Light Emitting Diode (OLED) display technology.
- The basis of microLED technology are sapphires. A sapphire can shine on its own forever.
- A microLED screen is filled with such small but strong light. The picture in a microLED screen is generated by several individual light-emitting diodes.
- Samsung, the pioneer in microLED technology explained that a microLED is as small as cutting a centimetre of hair into 200 smaller pieces.
- Each of these microLEDs are semiconductors that receive electric signals. Once these microLEDs are gathered, they form a module. Several modules are then combined to form screens.



- MicroLED displays are brighter, have better colour reproduction and provide better viewing angles.
- They make images appear as if they painted on top of the device's glass and are quite the technological feat, according to a report by Bloomberg.
- MicroLEDs have limitless scalability, as they are resolution-free, bezel-free, ratio-free, and even size-free.
- The screen can be freely resized in any form for practical usage. In addition to being self-emissive, MicroLEDs also individually produce red, green, and blue colours without needing the same backlighting or colour filters as conventional displays, according to Samsung.
- The electronics company is currently the world's most advanced manufacturer of displays, and has been producing its own version of microLED for TVs.
- Samsung and LG Displays have evolved with brighter OLED panels over the last couple of years but microLED promises even greater luminance without panel degradation issues.
- Samsung has come up with MicroLED displays with up to 4,000 nits of peak brightness, roughly double of what the best OLED and LCD TVs are capable of right now.

Data Embassies

Why in News

The Union budget 2023-24 has proposed to facilitate setting up of data embassies.

Important Points

Data Embassy

- A data embassy is a solution implemented by nation-states to ensure a country's digital continuity with particular respect to critical databases.
- It consists of a set of servers that store one country's data and are under that country's jurisdiction while being located in another country.
- Data embassies create a new approach to securing data by leveraging diplomatic agreements bolstered by cloud technology solutions.
- According to a Google Cloud blog post, small countries around the world are turning to the concept of data embassies because they are in need of sovereign and resilient infrastructure.
- Cloud computing is being quickly embraced by businesses for its speed, scale, and financial advantages. Governments are doing the same.
- In 2015, Microsoft and Estonia, one of the world's most mature countries in digital administration, partnered on the virtual data embassy research project.
- Luxembourg, Monaco and some other nations have adopted the data embassy model.

Dark Galaxy

Why in News

A team of researchers from Italy has been able to detect Black/Darkgalaxy using Atacama Large Millimetre/Submillimeter Array (ALMA)

Important Points

About Dark galaxy

- A dark galaxy is a hypothesized galaxy with no, or very few, stars.
- They received their name because they have no visible stars, but may be detectable if they contain significant amounts of gas.
- The team revealed that it is compact, and containing large quantities of interstellar dust, it is a young galaxy, forming stars at about 1000 times the rate of the Milky Way.
- Astronomers have long theorized the existence of dark galaxies, but there are no confirmed examples to date.
- Dark galaxies are distinct from intergalactic gas clouds caused by galactic tidal interactions, since these gas clouds do not contain dark matter, so they do not technically qualify as galaxies.
- Distinguishing between intergalactic gas clouds and galaxies is difficult; most candidate dark galaxies turn out to be tidal gas clouds

What is Atacama Large Millimetre/Submillimeter Array(ALMA)?

- ALMA is an astronomical interferometer of 66 radio telescopes in the Atacama Desert of northern Chile, which observe electromagnetic radiation at millimeter and submillimeter wavelengths.
- The array has been constructed on the 5,000 m (16,000 ft) elevation Chajnantor plateau – near the Llano de Chajnantor Observatory and the Atacama Pathfinder Experiment.
- This location was chosen for its high elevation and low humidity, factors which are crucial to reduce noise and decrease signal attenuation due to Earth's atmosphere.
- ALMA provides insight on star birth during the early Stelliferous era and detailed imaging of local star and planet formation.
- ALMA is an international partnership amongst Europe, the United States, Canada, Japan, South Korea, Taiwan, and Chile.
- Costing about US$1.4 billion, it is the most expensive ground-based telescope in operation.
- ALMA began scientific observations in the second half of 2011 and the first images were released to the press on 3 October 2011.
- The array has been fully operational since March 2013.

Use of Phosphor-Gypsum (Phosphogypsum) in National Highway construction

Why in News

NHAI along with Department of Fertilizers, Ministry of Chemicals & Fertilizers is going to take up field trials on NHAI projects for use of Phosphor-Gypsum in National Highway construction to achieve a circular economy in the use of Gypsum.

Important Points

- The road was evaluated by Central Road Research Institute (CRRI) and based on their report, the Indian Road Congress (IRC) has accredited neutralized Phosphor-Gypsum waste material for road construction for a period of three years.
- The fertilizer company and CRRI have been asked to take up field trials on an NHAI project to evaluate performance of Phosphor-Gypsum on a National Highway and to generate confidence among various stakeholders on use of Phosphor-Gypsum waste material in Highway construction.

- NHAI is also encouraging use of waste plastic in road construction, which has already been tested very successfully.
- Studies have established that roads built using plastic waste are durable, sustainable and increases life of the bitumen.
- Construction of one kilometre of 4-lane highway helps in disposal of approximately seven tons of plastic waste.
- Similarly, NHAI has used 'Fly Ash' – fine residue of coal combustion in the Thermal Power Plants (TPPs) for construction of Highways and flyover embankments.
- The 135 km long, six lane 'Eastern Peripheral Expressway', used 1.2 crore cubic meter of fly-ash in its construction.
- NHAI has been encouraging the innovative use of new materials and is focused on reducing the carbon footprint, enhancing durability and making construction more economical.

What is Phosphor-Gypsum?

- Phosphogypsum (PG) is the calcium sulphate hydrate formed as a by-product of the production of fertilizer from phosphate rock.
- It is mainly composed of gypsum (CaSO4·2H2O).
- Although gypsum is a widely used material in the construction industry, phosphogypsum is usually not used, but is stored indefinitely because of its weak radioactivity caused by the presence of naturally occurring uranium (U) and thorium (Th), and their daughter isotopes radium (Ra), radon (Rn) and polonium (Po). The long-range storage of phosphogypsum is controversial.

First ever Indigenous – Automatic Train Supervision(ATS)

Why in News

Bharat Electronics announced that the Delhi Metro launched India's first ever indigenously developed Train Control & Supervision System.

Important Points

About i-ATS

- It was jointly developed by the Bharat Electronics & Delhi Metro Rail Corporation (DMRC), the i-ATS for operations on its first corridor, Red Line (Rithala to Shaheed Sthal).
- Beginning with Red Line, the i-ATS System will further be deployed for operations on Delhi Metro's other operational corridors and the upcoming independent corridors of Phase – 4 Project as well.
- In addition, i-ATS can be used in operations of other rail based systems including Indian Railways.
- This technology has been developed with flexibility to work with different Signalling vendor's systems with suitable changes.
- With the launch of i-ATS, India becomes the sixth country which has its own ATS products after France, Germany, Japan, Canada, and China.
- With this development, the country has moved a step forward for an indigenously built CBTC (Communication Based Train Control) based signalling system for the Metro railway.
- The ATS (Automatic Train Supervision), is a computer-based system which manages train operations.
- It is also an important sub-system of the CBTC Signalling system.

Project ELLORA

Why in News

Microsoft's Project ELLORA is helping small languages like Gondi, Mundari become eloquent for the digital world.

Important Points

About the Project ELLORA (Enabling Low Resource Languages) in India

- To bring 'rare' Indian languages online, Microsoft launched project ELLORA or Enabling Low Resource Languages in 2015.
- Under the project, researchers are building digital resources of the languages.
- They say that their purpose is to preserve a language for posterity so that users of these languages "can participate and interact in the digital world."
- The main goal of ELLORA is to impact underserved communities through enabling language technology by creating economic opportunities, building technological skills, enhancing education and preserving local language and cultures for future generations. ELLORA aims to do this by:
- Data: New/Innovative methodologies for data design and collection, e.g., gamification of data collection, crowdsourcing.
- Language Technology Systems: Designing new techniques and framework/architecture for technology for low resource languages, building Speech and NLP systems for low resource languages.
- Applications: At scale deployments of language technology applications that impact the community.
- Microsoft Research (MSR) has chosen to focus on three of these for now.

Gondi language

- It is a South-Central Dravidian language, spoken by about three million Gondi people, chiefly in the Indian states of Madhya Pradesh, Maharashtra, Chhattisgarh, Andhra Pradesh, Telangana and by small minorities in neighbouring states.
- Gondi is a unique script, which is perhaps the only script in the country besides Urdu which is written right to left, also has three or four versions.
- Although it is the language of the Gond people, it is highly endangered, with only one fifth of Gonds speaking the language.
- Another unique quality of the script is that in the northern and central parts of India, it is the only language, barring Gujarati, which has a script of its own.
- All other north and central Indian languages use the Devnagri script.
- Gondi has a rich folk literature, examples of which are marriage songs and narrations. Gondi people are ethnically related to the Telugus.

Mundari language

- Mundari is a Munda language of the Austroasiatic language family spoken by the Munda tribes in eastern Indian states of Jharkhand, Odisha and West Bengal.
- It is closely related to Santali. Mundari Bani, a script specifically to write Mundari, was invented by Rohidas Singh Nag.
- It has also been written in the Devanagari, Odia, Bengali, and Latin writing systems.

Idu Mishmi language

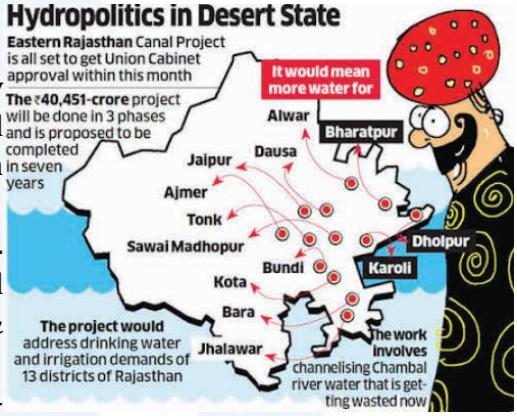
- It is a small language spoken by the Mishmi people in Dibang Valley district, Lower Dibang Valley district, Lohit district, East Siang district, Upper Siang district of Arunachal Pradesh and in Zayü County of the Tibet Autonomous Region, China.
- It is considered an endangered language.
- The Idu Mishmi people did not usually have a script of their own. When needed Idu Mishmis tended to use the Tibetan script.
- Currently the Idu Mishmi have developed a script known as "Idu Azobra".

The Eastern Rajasthan Canal Project(ERCP)

Why in News

The Rajasthan government has allocated Rs 13,000 crore for the Eastern Rajasthan Canal Project in the state Budget 2023-24. But the state wants the Centre to share the cost of the project.

Important Points



- It aims to harvest surplus water available during the rainy season in rivers in southern Rajasthan, such as the Chambal and its tributaries Kunnu, Parvati, and Kalisindh, and use it in the water-scarce south-eastern districts of the state.
- The project was approved by the Central Water Commission in 2017.
- This scheme is planned to meet the Drinking / Irrigation and Industrial water needs of the thirteen districts of Southern & South Eastern Rajasthan.
- According to the state Water Resources Department, Rajasthan's geographical area of 342.52 lakh hectares equals 10.4 percent of the entire country but holds only 1.16 per cent of India's surface water and 1.72 percent of groundwater.
- Among the state's water bodies, only the Chambal river basin has surplus water, but this water cannot be tapped directly because the area around the Kota barrage is designated as a crocodile sanctuary.
- Through the help of diversion structures, interbasin water transfers, linking channels, and building pumping main feeder channels, the ERCP aims to create a network of water channels that will cover 23.67 per cent of the area and 41.13 per cent of the population of the state.
- ERCP will help fulfil the long-term irrigation and drinking water needs of 13 districts: Jhalawar, Baran, Kota, Bundi, Sawai Madhopur, Ajmer, Tonk, Jaipur, Karauli, Alwar, Bharatpur, Dausa, and Dholpur.
- Under the project the surplus water in the sub basins of Kunnu, Kul, Parvati, Kalisindh and Mej rivers received during monsoon has to be carried to the sub basin of Banas, Morel, Banganga, Gambhir and Parbati rivers.
- The project will help to irrigate nearly 2.8 lakh hectares of land through 26 different large and medium projects.
- Proposed to be completed in three phases in seven years from 2017 to 2023.

Khanan Prahar app

Why in News

The government of India has launched a mobile app namely 'Khanan Prahari' and a web app Coal Mine Surveillance and Management System (CMSMS).

Important Points

Khanan Prahari & CMSMS

- Khanan Prahari is a Mobile App of Ministry of Coal for Reporting Illegal Coal Mining and a tool for reporting any illegal coal mining incident through geo-tagged photographs as well as textual information by any citizen from the place of incidence.

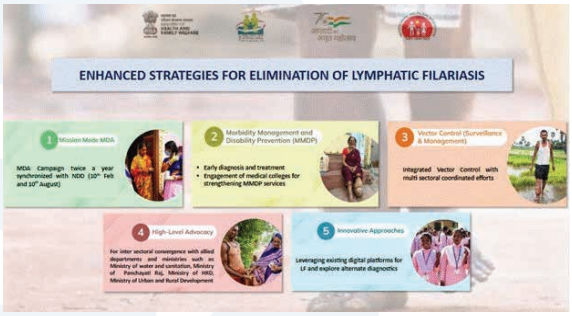
- The reported incidents will be analysed & suitable action will be taken by concerned authorities. The action taken can be viewed on the CMSMS website.
- CMSMS has been developed to curb illegal mining and take transparent action as an e-Governance initiative of the government on the use of Space Technology.
- The objective of development and launching of this CMSMS application was to detect citizens' participation against illegal mining by receipt of citizen's complaints through mobile app – Khanan-Prahari and to monitor and take action on any kind of illegal coal mining activity being carried out within the leasehold boundaries of any Coal Mining Project in the Coalfield Areas.
- There are two ways in which illegal coal mining is reported/ identified through CMSMS: Through periodic scanning of Satellite imagery (In house) Through mobile app "Khanan Prahari" (Public)
- Any person/ group/ organisation with a smart phone can report the incident through the mobile app "Khanan Prahari".

A nationwide campaign to end filariasis

Why in News

Ministry of Health & Family Welfare launched a nationwide Mass Drug Administration (MDA) campaign to Eliminate Lymphatic Filariasis (LF).

Important Points



- It is aimed at ending disease transmission through the door-to-door administration of anti-filarial drugs, especially in 10 filaria affected states.
- This launch comes a month after the program received resounding support from the Hon'ble Health Minister to eliminate Filariasis by 2027, three years ahead of the global target.
- High-burden districts in Bihar, Chhattisgarh, Jharkhand, Maharashtra, Uttar Pradesh, West Bengal, Karnataka, Odisha, Madhya Pradesh, and Andhra Pradesh jointly launched the campaign.
- India has ramped up efforts in eliminating Lymphatic Filariasis a Vector Borne Disease caused by Culex mosquitoes which causes disability well ahead of global targets to safeguard communities from disability, social and economic insecurity.
- The Government of India has already unveiled a renewed five-pronged strategy for elimination of LF as shown in the figure below.

What is Filariasis?

- Lymphatic filariasis, commonly known as elephantiasis, is a neglected tropical disease.
- Infection occurs when filarial parasites are transmitted to humans through mosquitoes. Infection is usually acquired in childhood causing hidden damage to the lymphatic system.
- It impairs the lymphatic system and can lead to the abnormal enlargement of body parts, causing pain, severe disability and social stigma.
- The painful and profoundly disfiguring visible manifestations of the disease, lymphoedema, elephantiasis and scrotal swelling occur later in life and can lead to permanent disability.
- These patients are not only physically disabled, but suffer mental, social and financial losses contributing to stigma and poverty.
- Lymphatic filariasis is caused by infection with parasites classified as nematodes (roundworms) of the family Filariodidea. There are 3 types of these thread-like filarial worms:
- Wuchereria bancrofti, which is responsible for 90% of the cases
- Brugia malayi, which causes most of the remainder of the cases
- Brugia timori, which also causes the disease.
- Adult worms nest in the lymphatic vessels and disrupt the normal function of the lymphatic system. The worms can live for approximately 6–8 years and, during their lifetime, produce millions of microfilariae (immature larvae) that circulate in the blood.

- Mosquitoes are infected with microfilariae by ingesting blood when biting an infected host. Microfilariae mature into infective larvae within the mosquito.
- When infected mosquitoes bite people, mature parasite larvae are deposited on the skin from where they can enter the body. The larvae then migrate to the lymphatic vessels where they develop into adult worms, thus continuing a cycle of transmission.
- Lymphatic filariasis is transmitted by different types of mosquitoes for example by the Culex mosquito, widespread across urban and semi-urban areas, Anopheles, mainly found in rural areas, and Aedes, mainly in endemic islands in the Pacific.
- Lymphatic filariasis infection involves asymptomatic, acute, and chronic conditions.
- The majority of infections are asymptomatic, showing no external signs of infection while contributing to transmission of the parasite.
- These asymptomatic infections still cause damage to the lymphatic system and the kidneys and alter the body's immune system.

Integrated rice-fish farming by Apatanis

Why in News

The Apatanis, one of the major ethnic groups of the eastern Himalayas, practise a distinctive form of agriculture where rice and fish are grown together.

Important Points

About Integrated rice-fish farming

- These farmers have been practising integrated rice-fish farming in their mountain terraces of Arunachal Pradesh since the 1960s.
- The potential areas of rice-fish culture in the Apatani plateau are Napping, Yachuli, Ziro-II, Palin and Koloriang. Apatanis principally use three rice varieties: Emeo, Pyape and Mypia.
- The total area of the Apatani Plateau is 10,135 square kilometres, where rice-fish culture is undertaken approximately in 592.0 hectares (ha).
- Apatani Plateau has a climate ranging from humid subtropical to temperate. So, this plateau receives adequate rainfall during the summer season. The permeability and water-retaining capacity of the clayey, loamy soil favour this unique farming technique.
- This integrated rice-fish cultivation is a low-input and eco-friendly practice. The stocked fish practically depend on the natural food sources of the rice fields and thus, farmers hardly need to use any supplementary fish feeds.
- The farmers sometimes use household and agricultural wastes and excreta of domestic animals like pigs, cows, mithun (Bos frontalis) and goats to make farming more sustainable and organic.
- Moreover, azolla and lemna are also grown in the field water as nitrogen fixers. The organic food grown in the field plays an essential role in feeding fish.
- The water sources in these high-altitude rice fields are mountain streams and rainwater trickled down during the monsoon season.
- Bamboo pipes are being used to distribute water from the networks of earthen irrigation channels using two outlet pipes.
- An outlet is fitted angularly at the upper level through a dyke to maintain the water level and another outlet is fitted at the bottom of the dyke to the exterior. It is used for dewatering the field during harvest.
- Dykes at a higher elevation and lower elevation are constructed with a height of 0.9 m to 1.5 m and 0.4 to 0.6 m. These dykes are also used to remove water from the field during harvesting. Bamboo fencing is done to avoid the escape of fish through the pipes.
- Men and women perform different farm duties while preparing the fields for cultivating rice. And during the culture of fish, women folk participate as the major workforce.
- They mostly use agricultural tools such as Dao (sickle) and dibbling sticks. After preparing the field, they transplant a maximum of two-three healthy rice plants with an average distance of 26 cm from each other.

- Fish refuges are also created inside the fields. Three strains of fish species of common carp — Cyprinus carpiospecularis, Cyprinus carpio communis, Cyprinus carpionudus are stocked just after ten days from transplanting rice.
- The stocked fish are harvested twice in a season. The first and second or final harvest is done in the middle of July and October, respectively. But the rice is harvested at the end of September until the mid of October, i.e. once in a season.
- Four cultivars of rice are grown along with fish species of Cyprinus carpiol.
- Fish enhances rice productivity (by 10-15 per cent) by controlling the growth of algae, weeds and insects, providing nutrient input through fish excreta and promoting tillering of the rice through the movement of fish inside the field.
- Further, the mineralisation of organic matter, puddling of mud and soil aeration by other benthos enhances rice yield here.
- This eco-friendly and economically beneficial practice has made the system unique in terms of aquatic resource utilisation.

About Apatanis

- The Apatani (or Tanw, Tanii) are a tribal group of people living in the Ziro valley in the Lower Subansiri district of Arunachal Pradesh in India.
- Apatani Plateau is a land of diverse cultures. The major festivals of Apatanis are the Myoko, Dree, Yapung and Murung.
- The Apatanis speak a local language called Tani, including Apatani, English and Hindi.
- They worship the sun and the moon
- The tribe has extensive knowledge of herbal remedies to cure most of their ailments. Local ritual specialists also take part in chanting, blood-letting and animal sacrifices in a bid to keep the inhabitants healthy.
- They are known for their effective traditional village council called bulyañ, which supervises, guides and have legal oversight over the activities of individuals that affect the community as a whole.
- Unlike the other tribes, they are non-nomadic in nature.
- The Apatanis are among the few tribes in the world who continue to worship nature
- Their wet rice cultivation system and their agriculture system are extensive even without the use of any farm animals or machines.
- So is their sustainable social forestry system.
- UNESCO has proposed the Apatani valley for inclusion as a World Heritage Site for its "extremely high productivity" and "unique" way of preserving the ecology.

XDI Gross Domestic Climate Risk

Why in News

XDI Gross Domestic Climate Risk, "world-first" index that assesses the risk posed to the built environment across the world due to extreme weather events, has been released by the Cross Dependency Initiative (XDI) recently.

Important Points

About the report/index

- The index calculated the 'physical climate risk' to built environments such as buildings and properties across 2,600 States and provinces globally in 2050.
- Physical risk refers to vulnerability from eight climate change events: heat waves, coastal flooding (and sea level rise), extreme wind, forest fire, soil movement (or other drought-related hazards), free thaw, riverine and surface flooding.
- The report compared the risk across territories based on modelled projections of damage, using global climate models, local weather and environmental data.
- Together, the index assigned an Aggregated Damage Ratio (ADR) to each region, which signifies the total amount of damage a region's built environment would sustain in 2050.
- A high ADR signifies more peril.
- This is the first time there has been a physical climate risk analysis focused exclusively on the built environment, comparing every state, province and territory in the world.

- The Gross Domestic Climate Risk analysis focuses on the extent of capital value at risk from extreme weather and climate change in states, provinces and other territories, represented by vulnerability and exposure of the built environment.
- The Cross Dependency Initiative (XDI) is a global organisation specialising in climate risk analysis for regions, banks and companies.
- Now, for the first time, the finance industry can directly compare Mumbai, New York and Berlin using a like-for-like methodology.
- The report's modelling is conducted under the Intergovernmental Panel on Climate Change's RCP 8.5 scenario – a scenario projecting high emissions, consistent with average global warming over 3 degree C above pre-industrial temperatures by the end of the century.

Key findings of the index

- Overall, India, China and the U.S, globally significant states are home to 80% of the most vulnerable cities and centres of economic activity around the world.
- Two of China's largest sub-national economies, Jiangsu and Shandong top the global ranking; followed by the U.S. which has 18 regions in the top 100 list; including economically-important regions of Florida, Texas and California.
- Asia dominates the list largely, with 114 of the top 200 regions falling in the continent, with the mention of Pakistan, Indonesia and most Southeast Asian countries.
- Devastating flooding between June and August 2022 affected 30% of the area of Pakistan and has partially or fully damaged more than 900,000 houses in Sindh province.
- Notably, the most damage posed to built infrastructure globally is caused by riverine and surface flooding or flooding combined with coastal inundation.

What does the index say about India?

- It shows that 14 Indian states are set to remain within the top 100 most climate risk-prone territories of the world by 2050, within a list that has more than 2,600 regions.
- Punjab, Bihar, Uttar Pradesh, Assam, Rajasthan, Tamil Nadu, Maharashtra, Gujarat and Kerala fall in top 50 as India has 9 states as most disturbed on the count.
- Madhya Pradesh, West Bengal, Haryana, Karnataka and Andhra Pradesh are other Indian states remaining within the top 100 most climate vulnerable regions.
- According to the report, Assam, Bihar and Tamil Nadu had the highest ADR among other Indian States.
- Assam, in particular, would witness the maximum increase of climate risk: rising up to 330% by 2050 as compared to 1990.
- Assam has witnessed an exponential increase in flood events since 2011, and it had 15 of India's 25 districts most vulnerable to climate change.
- Further, 11 of the 36 districts in Maharashtra were found to be "highly vulnerable" to extreme weather events, droughts and dwindling water security.
- The Climate Risk Index in 2019, which ranked countries based on their vulnerability to fatalities and economic losses, found India to be the seventh-worst hit due to extreme weather events.
- Another report in 2022 by the Centre for Science and Environment found India recorded the most extreme weather events in 2022; there was a disaster on 247 out of 273 days between January 1 to September 30.

Sagar Parikrama Phase-III

Why in News

The Union Minister of Fisheries, Animal Husbandry and Dairying has launched the Sagar Parikrama Phase-III from Hazira Port, Gujarat.

Important Points

About Sagar Parikrama Phase-III

- Sagar Parikrama is a program that reflects the far-reaching policy strategy of the government leading to the direct interaction with fishers and fish farmers to understand the issues of coastal areas and problems related to fishermen.
- Phase I&II have brought initiation of Artificial Reefs and Sea Ranching, among many other innumerable benefits.
- The Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India, and National Fisheries Development Board, along with the Department of Fisheries, Government of Gujarat, Commissioner of Fisheries, Government of Maharashtra, Indian Coast Guard, Fishery Survey of India, Gujarat Maritime Board, and fishermen representatives, takes part in the event.
- The main objectives of 'Sagar Parikrama' are
- To facilitate interaction with fishermen, coastal communities and stakeholders so as to disseminate information of various fisheries related schemes and programs being implemented by the Government.
- Demonstrating solidarity with all fisher folk, fish farmers and concerned stakeholder as a spirit of Aatmanirbhar Bharat.
- To promote responsible fisheries with focus on sustainable balance between the utilization of marine fisheries resources for the food security of nations and livelihoods of coastal fisher communities.
- Protection of marine ecosystems.
- Phase I Programme of 'Sagar Parikrama' was organized in Gujarat, started on 5th March, 2022 from Mandvi and ended on 6th March 2022 at Porbandar, Gujarat.

- Phase II The voyage Sagar Parikrama as Phase –II programme started on 22nd September 2022 from Mangrol to Veraval and ended at Mul Dwaraka, on 23rd September 2022 from Mul Dwaraka to Madhwad.
- Phase III Program of 'Sagar Parikrama' starts from today i.e., 19th Feb 2023 from Surat, Gujarat, and ends on 21st Feb 2023 at Sasson Dock, Mumbai.
- The journey of Sagar Parikrama focuses on the sustainable balance between the utilization of marine fisheries resources for the food security of the nation and livelihoods of coastal fisher communities and the protection of marine ecosystems, to bridge the gaps of fisher communities, and their expectations, development of fishing villages, upgradation and creation of infrastructure such as fishing harbours & landing centers to ensure sustainable and responsible development through an ecosystem approach.
- Sagar Parikrama program is celebrated in all coastal States/UTs.
- To improve the quality of life and economic well-being of fisheries and fishermen in rural areas and to create more livelihood opportunities, a holistic approach has been adopted.

Khalistan movement

Why in News

Several followers of Amritpal Singh, a radical preacher and pro-Khalistan leader, clashed violently with police outside Ajnala police station near Amritsar.

Important Points

- The Khalistan movement is a fight for a separate, sovereign Sikh state in present day Punjab (both India and Pakistan).

- Over the years, it has survived in various forms, in various places and amongst different populations.
- The movement was crushed in India following Operation Blue Star (1984) and Operation Black Thunder (1986 and 1988), but it continues to evoke sympathy and support among sections of the Sikh population, especially in the Sikh diaspora in countries such as Canada, the UK, and Australia.
- The origins of the movement have been traced back to India's independence and subsequent Partition along religious lines.

- The Punjab province, which was divided between India and Pakistan, saw some of the worst communal violence and generated millions of refugees: Sikhs and Hindus stranded on the west (in Pakistan) rushed to the east, whereas Muslims in the east fled westward.
- Lahore, the capital of Maharaja Ranjit Singh's great Sikh Empire, went to Pakistan, as did holy Sikh sites including Nankana Sahib, the birthplace of Guru Nanak, the founder of Sikhism.
- While most Sikhs found themselves in India, they were a small minority in the country, making up around 2 per cent of the population.
- The political struggle for greater autonomy began around the time of Independence, with the Punjabi Suba Movement for the creation of a Punjabi-speaking state.
- The States Reorganisation Commission, in its 1955 report, rejected this demand, but in 1966, after years of protest, the state of Punjab was reorganised to reflect the Punjabi Suba demand.
- The erstwhile Punjab state was trifurcated into the Hindi-speaking, Hindu-majority states of Himachal Pradesh and Haryana, and the Punjabi-speaking, Sikh-majority Punjab.

The Anandpur Sahib Resolution

- The Punjabi Suba movement had galvanised the Akali Dal which became a major force in the new Sikh-majority Punjab, and gave the Congress hard fights in the Legislative Assembly elections of 1967 and 1969.
- But in 1972, in the aftermath of Indira Gandhi's resounding victory in the 1971 Lok Sabha elections, the Akali Dal's performance in the state was underwhelming.
- The party met at the sacred town of Anandpur Sahib, the birthplace of the Khalsa, in 1973, and released a list of demands that would guide the political path of the Akali Dal.
- Among other things, the Anandpur Sahib Resolution demanded autonomy for the state of Punjab, identified regions that would be part of a separate state, and sought the right to frame its own internal constitution.
- The Akali Dal was trying to cash in on the growing demand for an autonomous state which had emerged alongside the Punjabi Suba movement and had gone global by 1971 — when an advertisement appeared on The New York Times proclaiming the birth of Khalistan.
- While the Akalis themselves repeatedly made it clear that they were not demanding secession from India, for the Indian state, the Anandpur Sahib Resolution was of grave concern.

What was Operation Blue Star?

- Operation Blue Star was the codename of a military operation which was carried out by Indian security forces between 1 and 10 June 1984 in order to remove Damdami Taksal leader Jarnail Singh Bhindranwale and his followers from the buildings of the Golden Temple, the holiest site for Sikhs which is located in Amritsar, Punjab, India.

- By 1984, the situation in Punjab had become increasingly untenable for the government.
- Bhindranwale had given a call to arms, and instances of violence against Hindus as well as government officers had become common.
- In 1983, a senior police officer was shot dead after praying at the Golden Temple and his body was left to decay in the sun, while the local police station did nothing — perhaps both out of fear and sympathy to Bhindranwale's cause.
- Indira Gandhi took the fateful decision to order the Indian Army to flush out militants from the Golden Temple and neutralise Bhindranwale.
- Operation Blue Star began on June 1, 1984, but due to fierce resistance from Bhindranwale and his heavily armed supporters, the Army's operation became larger and more violent than had been originally intended, with the use of tanks and air support.
- The image of Indian Army tanks shelling the holiest shrine of Sikhism was traumatic, and the very large number of civilian casualties that occurred during the operation added to the trauma.
- While the operation was ostensibly successful in its aims — Bhindranwale was killed and the Golden Temple was freed of militants — it gravely wounded the Sikh community around the world. It also galvanised the demand for Khalistan.
- On October 31, 1984, Prime Minister Indira Gandhi was assassinated by two Sikh bodyguards.
- This triggered the worst communal violence since Partition — even according to conservative estimates, over 8,000 Sikhs were massacred in massive anti-Sikh street violence.
- A year later, Sikh nationalists based in Canada blew up an Air India flight killing 329 people. They claimed that the attack was to "avenge Bhindranwale's killing".
- Punjab saw the worst violence, becoming the hub of a long drawn out insurgency that lasted till 1995.

Chapter-
7

INTERNATIONAL RELATION

iCET dialogue

Why in News

National Security Advisor Ajit Doval and his US counterpart Jake Sullivan formally launched the US-India initiative on Critical and Emerging Technology (iCET) in Washington.

Important Points

About iCET dialogue

- Announced during US President Joe Biden and Prime Minister Narendra Modi's bilateral talks in Tokyo in May 2022, the iCET is spearheaded by the National Security Councils of both countries.
- It focuses on strengthening the US-India partnership on the technologies that will drive global growth, bolster both countries' economic competitiveness, and protect shared national security interests.
- iCET will accelerate the US' strategic technology partnership with India and advance the two countries' shared democratic values.
- The inaugural meeting under Critical and Emerging Technology (iCET) was hosted by the US-India Business Council with US Secretary of Commerce Gina Raimondo, US National Security Advisor Jake Sullivan, and Indian National Security Advisor Ajit Doval, and other senior US and Indian officials.
- As part of this, a task force will be formed between the US Semiconductor Industry Association (SIA) in partnership with the India Electronics Semiconductor Association (IESA) with participation from the Government of India Semiconductor Mission to develop a "readiness assessment" to identify near-term industry opportunities and facilitate the longer-term strategic development of complementary semiconductor ecosystems.
- This task force will make recommendations to the Department of Commerce and the India Semiconductor Mission on opportunities and challenges to overcome in order to further strengthen India's role within the global semiconductor value chain, and will also provide input to the US-India Commercial Dialogue.
- The task force will also identify and facilitate workforce development, R&D, advanced packaging, and exchange opportunities to benefit both countries.

- In addition, the two nations are signing a new Implementation Arrangement for a Research Agency Partnership between the National Science Foundation and Indian science agencies to expand international collaboration in various areas. This includes artificial intelligence, quantum technologies, and advanced wireless.
- They are also establishing a joint Indo-US Quantum Coordination Mechanism with participation from industry, academia, and government to facilitate research and industry collaboration.
- In addition, they are also promoting collaboration on High Performance Computing (HPC), including by working with Congress to lower barriers to U.S. exports to India of HPC technology and source code.
- India and the US are also developing a new bilateral Defense Industrial Cooperation Roadmap to accelerate technological cooperation between both countries for joint development and production, with an initial focus on exploring projects related to jet engines, munition-related technologies, and other systems.

Green Deal Industrial Plan of EU

Why in News

In a bid to support and expand its green industry, the European Union on February 1 revealed the "Green Deal Industrial Plan" that aims to cut red tape and provide massive subsidies.

Important Points

- The proposal involves building a simpler regulatory framework, providing faster access to funds, enhancing skills and improving the EU's trade network.
- The plan seeks to formulate a "Net-Zero Industry Act", which will not only simplify rules but also speed up the issuance of permits for green projects, such as renewable energy generation arrays, carbon capture and renewable hydrogen production facilities.
- It also includes a "Critical Raw Materials Act", which will provide access to materials like rare earths that are crucial for developing net-zero technology.
- According to the proposal, state aid rules will be loosened in order to help EU's 27 governments with investing in the clean energy projects.
- Keeping in mind that every country doesn't have deep pockets like France and Germany to provide subsidies to companies, the plan allows countries to take money from existing EU funds.
- Notably, the proposal doesn't involve any fresh crash and seeks to direct €250 billion to serve the green industry from the existing EU money, which is around €800 billion.
- There is also a provision for setting up a "European Sovereignty Fund" in the future to "give a structural answer to the investment needs".
- The plan aims to establish "Net-Zero Industry Academies" that will provide up-skilling and re-skilling programmes in strategic industries.
- According to the European Commission, 30 to 40 per cent of the existing jobs might get affected due to green transition. Therefore, the "Green Deal Industrial Plan" focuses on developing the skills needed for well-paid quality jobs.
- The plan underlines the importance of open trade and seeks to further "develop the EU's network of Free Trade Agreements and other forms of cooperation with partners to support the green transition."

Counter to the USA's Inflation Reduction Act (IRA)?

- The move has come just a few months after the United States announced its Inflation Reduction Act (IRA), which contains billions of dollars of tax cuts for clean energy and climate change programs with incentives for US-based manufacturing.
- In August 2022, President Joe Biden's administration unveiled its climate change legislation, which will direct $390 billion towards clean energy projects.
- The IRA provides huge tax breaks and incentives to both customers and manufacturers. However, soon after the legislature was revealed, leaders of the European Union expressed concerns regarding its possibly "discriminatory" provisions.
- The EU members have claimed that IRA's tax credits and subsidies to green product makers would put European companies at a disadvantage and might lure them to the United States.

State of the Union (SOTU)

Why in News

The US President Joe Biden has delivered his second State of the Union (SOTU) Address to a Joint Session of Congress at the United States Capitol in Washington DC.

Important Points

About the SOTU address

- The formal basis of the Address lies in the US Constitution itself.

- Article II, Section 3, Clause 1 of the Constitution says the President "shall from time to time give to the Congress Information of the State of the Union, and recommend to their Consideration such measures as he shall judge necessary and expedient"
- The first of these annual addresses was given by the first President George Washington in 1790.
- However, it was not called SOTU then — for more than a century and a half up to 1946, the Address was formally known as the "Annual Message".
- Already from 1942 though, the message had started to be informally referred to as the "State of the Union" message or address.
- And beginning with President Harry S Truman's message to Congress on January 6, 1947, the address came to be officially known as the State of the Union Address.
- SOTU Addresses in the modern era have been delivered in the chamber of the House of Representatives.
- A House concurrent resolution decides on the day and time for the Joint Session of Congress to listen to the President.
- Up until 1934, the President's Annual Message was delivered in December; since then, the Annual Message/ SOTU has been delivered in January or February.
- Biden's second SOTU Address on February 7 will be the 99th in-person Address/Annual Message in US history.

- President Franklin D Roosevelt's 1945 Address was read to a Joint Session of Congress — since the President did not himself deliver it, it is not counted as an in-person address.
- Annual Messages by earlier Presidents were more in the nature of Budget speeches — they included agency budget requests and general reports on the health of the US economy.
- Subsequently, as Congress required more in-depth reports on these aspects, the Budget Message was instituted by law in 1921 law, and the Economic Report in 1946. These messages were separate from the President's Annual Message.
- The practice of speaking directly to Congress had ceased after a few years into the Annual Message; this was revived after a gap of 113 years by President Woodrow Wilson in 1913.
- Ever since, the SOTU Address has served as a platform for the President to rally support for his agenda.

EU's Trade & Technology Council (TTC) with India

Why in News

India and the European Union recently announced the establishment of three Working Groups under the India-EU Trade and Technology Council, TTC and their Terms of Reference.

Important Points

About TTC

- TTC was launched by Prime Minister Narendra Modi and President of the European Commission Ursula von der Leyen during her visit to India in April in 2022.
- The TTC is a strategic coordination mechanism that will allow both partners to tackle challenges at the nexus of trade, trusted technology and security, and thus deepen cooperation in these fields between India and the EU.
- The TTC with India is only the second such Council for the EU(first one with the United States) and the first such mechanism for India.
- It will be co-chaired on the Indian side by the Ministers for External Affairs, Commerce and Industry and Communications, Electronics and Information Technology.
- The TTC will provide the political steer and the necessary structure to coordinate approaches and advance technical work

- The ministerial meetings of the TTC will take place at least once a year, with the venue alternating between the EU and India.

Working Groups

India and the European Union recently announced the establishment of three Working Groups they are:

1. Working group on Strategic Technologies, Digital Governance and Digital Connectivity-Chaired by Secretary, Ministry of Electronics and Information Technology.
2. Working Group on Green and Clean Energy Technologies-Chaired by Principal Scientific Adviser to the Government of India.
3. Working Group on Trade, Investment and Resilient Value Chains-Chaired by Secretary, Department of Commerce.

- The working group on strategic technologies, digital governance and digital connectivity will work jointly on areas of mutual interest such as digital connectivity, artificial intelligence, 5G/6G, high performance and quantum computing, semiconductors, cloud systems, cybersecurity, digital skills and digital platforms.
- The group on green and clean energy technologies will focus on green technologies, including investment and standards, with emphasis on research and innovation.
- The group on trade, investment and resilient value chains will work on the resilience of supply chains and access to critical components, energy, and raw materials.
- It will also work to resolve identified trade barriers and global trade challenges by promoting cooperation in multilateral fora. It will work towards promotion of international standards and cooperation on addressing global geopolitical challenges.

UN Commission for Social Development

Why in News

India's Ruchira Kamboj(Permanent Representative of India to the UN, Ambassador) has been elected as the Chair of the 62nd Session of the UN Commission for Social Development recently.

Important Points

- For the 62nd session, the priority theme of the session is decided as "Fostering Social Development and Social Justice through Social Policies to accelerate Progress on the Implementation of the 2030 Agenda for Sustainable Development and to achieve the overarching goal of poverty eradication."
- "The theme underlines an intrinsic and important connection between social development and social justice as fundamentals to achieving the SDGs.
- Along with India as the Chair, the commission also elected Jon Ivanovski (North Macedonia), Carla María Carlson (Dominican Republic), and Thomas Lammar (Luxembourg) as Vice-Chairs of the 62nd session.
- On the final day (February 15) of its 61st session, the commission decided to forward four draft resolutions to the Economic and Social Council for adoption (ECOSOC).
- The Chair of the 61st session of the commission was Alya Ahmed bin Saif Al-Thani, Ambassador and Permanent Representative of Qatar.

About the UN Commission for Social Development

- It is one of the key commissions tasked with monitoring and carrying out the Copenhagen Declaration and Programme of Action.
- It was established by the Economic and Social Council (ECOSOC), one of the six main organs of the United Nations.
- The commission's goal is to advise the ECOSOC, particularly on those social issues that are not dealt with by specialized intergovernmental organisations.

- Members: Originally 18, membership has been increased several times, most recently in 1996, and now stands at 46. Members are elected by ECOSOC based on equitable geographical distribution (as noted in the following list) for four-year terms.
- Since the World Summit for Social Development in Copenhagen in 1995, the Commission for Social Development (CSocD) has been the key United Nations body in charge of the follow up and implementation of the Copenhagen Declaration and Programme of Action.
- Originally known as the Social Commission but renamed in 1966.
- Its purpose was to advise ECOSOC on social policies of a general character and, in particular, on all matters in the social field not covered by the specialised inter-governmental agencies. The Commission's mandate was further developed by ECOSOC resolutions.
- Since 2006, the Commission has taken up key social development themes as part of its follow up to the outcome of the Copenhagen Summit.

Seattle bans caste discrimination

Why in News

Seattle became the first US city to outlaw caste discrimination, after its local council voted to add caste to the city's anti-discrimination laws.

Important Points

- The legislation banning caste-based discrimination will prohibit businesses from discriminating based on caste with respect to hiring, tenure, promotion, workplace conditions, or wages.
- It will ban discrimination based on caste in places of public accommodation, such as hotels, public transportation, public restrooms, or retail establishments.
- The law will also prohibit housing discrimination based on caste in rental housing leases, property sales, and mortgage loans.
- Basically, the legislation will recognise caste as a unique basis of discrimination, similar to race or gender.
- The resolution was moved by Kshama Sawant, Seattle City council member and upper-caste Hindu, and was approved by the Council by six to one vote.

Significance of the move

- This move has set a precedent for other cities also adopting such laws in the future. As Kshama Sawant's tweet indicates, Seattle is likely to be just the first city in the US to recognise and ban caste-based discrimination.
- A similar trend has been observed in college campuses across the US.
- In December 2019, Brandeis University near Boston became the first US college to include caste in its nondiscrimination policy.
- However, since then, the California State University System, Colby College, Brown University and the University of California, Davis have all adopted similar measures.

Chapter-
8

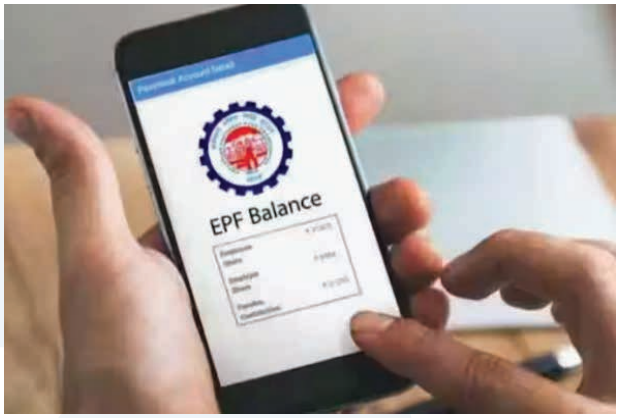
GOVERNMENT SCHEME

EPFO

Why in News

The EPFO has issued a fresh set of instructions for employees who had not opted for pension contributions.

Important Points



- Subscribers of the Employees' Provident Fund, who had not opted for higher pension under an earlier window, have been provided another option now.
- In compliance with the Supreme Court's order, the Employees' Provident Fund Organisation (EPFO) issued instructions to all its regional and zonal offices on the manner in which employees should apply for higher pensions.
- In a nutshell, the EPFO has now allowed subscribers to go beyond the pensionable salary capped at Rs 15,000 a month on which employers deduct a sum equal to 8.33 per cent of the 'actual basic salary' towards pension under the Employee Pension Scheme (EPS).
- What this essentially means is that an employee and an employer can sign up together, requesting the EPFO to deduct 8.33 per cent of the higher monthly basic salary, thus ensuring larger accumulation towards pension over their work life.
- With this new circular, the EPFO has covered the pending category of employees who continue to be in service on or after September 1, 2014.
- This will require reallocation of corpus from the Employees' Provident Fund to Employees' Pension Scheme from the date of joining membership under these schemes. Applications for higher pension needs to be submitted with the EPFO.
- The EPS, which is administered by the EPFO, provides employees with pension after the age of 58.
- Both the employee and the employer contribute 12 per cent of the employee's basic salary and dearness allowance to the EPF.
- The employee's entire part goes to EPF, while the 12 per cent contribution made by the employer is split as 3.67 per cent contribution to EPF and 8.33 per cent contribution to EPS.
- Apart from this, the Government of India contributes 1.16 per cent as well for an employee's pension. Employees do not contribute from their share of PF towards the pension scheme.
- The EPFO had instructed its field officers to allow option for higher contribution by: one, the employees and employers who had contributed on salary exceeding the wage ceiling of Rs 5,000 or 6,500; two, did not exercise joint option (by employer and employee) while being members of Employees' Pension Scheme (EPS 95); and three, were members prior to September 1, 2014 and continued to be a member on or after that date.
- For employees who had already contributed on higher wage but not exercised the option formally will now be required to submit an application at the regional office of EPFO.
- In case of the amount requiring adjustment from provident Fund to pension fund, and any re-deposit to the fund, explicit consent of the employee will be given in the joint option form.
- In case of transfer of funds from exempted provident fund trust to pension fund of EPFO, an undertaking of the trustee shall be submitted.
- In case of employees of unexempted establishments, refund of requisite employer's share of contribution, the same shall be deposited with interest at the rate declared under Para 60 of EPF Scheme. 1952, till the date of actual refund.

- SC had upheld the Employees' Pension (Amendment) Scheme, 2014, allowing another opportunity to EPF members who have availed of the EPS, to opt for higher annuity over the next four months.
- Employees who were existing EPS members as on September 1, 2014 were given another chance to contribute up to 8.33 per cent of their 'actual' salaries — as against 8.33 per cent of the pensionable salary capped at Rs 15,000 every month — towards pension.
- The Employees' Provident Funds and Miscellaneous Provisions Act, 1952 originally did not provide for any pension scheme.
- In 1995, through an amendment, a scheme was formulated for employees' pension, wherein the pension fund was to comprise a deposit of 8.33 per cent of the employers' contribution to be made towards the provident fund corpus.
- At that time, the maximum pensionable salary was Rs 5,000 per month, which was later raised to Rs 6,500.

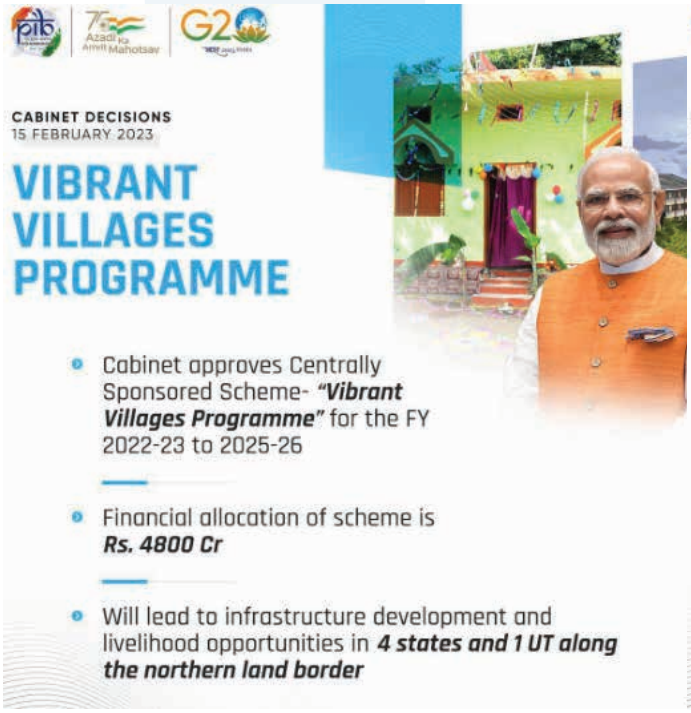
Vibrant Villages Programme

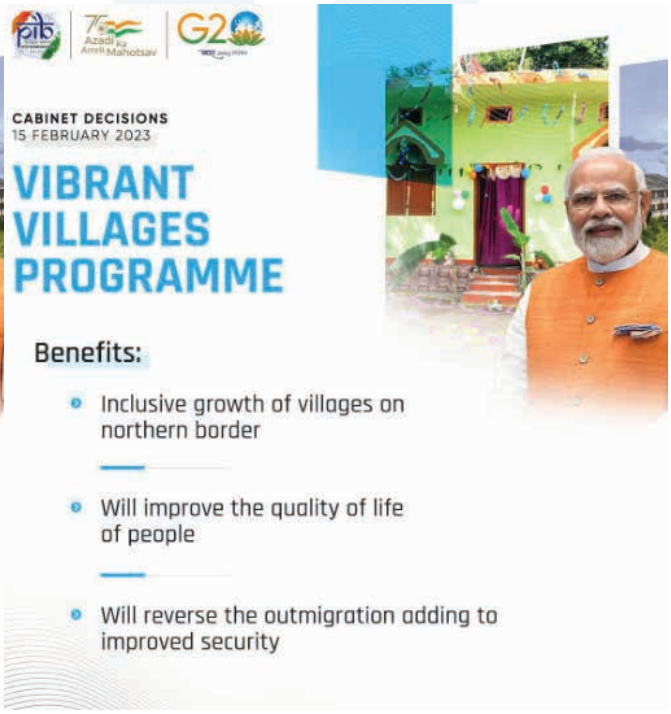
Why in News

Cabinet approves Centrally Sponsored Scheme- "Vibrant Villages Programme" for the Financial Years 2022-23 to 2025-26 Important Points

Important Points

- The Vibrant Villages Programme focuses on developing the rural areas in the northern border states and union territories. More than 663 villages will be developed under the programme.
- It is to be implemented for two years, that is, between 2022-23 and 2025-26.
- The Central Government allocated Rs 4,800 crores for the scheme. Of this Rs 2500 crores will be used for building roads. Cabinet approved the scheme recently.





Key Features of the scheme

- One – Village – One– Product concept will be adopted
- Social entrepreneurship will be encouraged by opening growth centres. These centres will work on "Hub and Spoke model"
- Skill development programmes for youth and women
- Heritage development and promotion of local traditional knowledge
- Development of eco-agribusinesses
- The NGOs, cooperatives, and Self Help Groups will be involved in the scheme

How will the scheme be implemented?

- Each village panchayat will create Village Action Plan with the help of the District administration.
- They should mainly focus on drinking water, 24/7 electricity, all-weather roads, solar energy projects, wind energy projects, internet connections, tourist centres, health and wellness centres, multi-purpose centres, etc.

Benefits and China factor

- The scheme will help India retain its population in the border area. With the Chinese infiltrations increasing at the border and China trying to increase its influence in the disputed land areas, it is essential for India to increase its population in these fragile zones.
- Recently China announced big railway plans in the disputed region. The 1962 Indo-China war happened because of the 219 NH that connects Tibet with China. China recently announced its plans to extend its railway line through this highway.

Jal Jan Abhiyan

Why in News

PM Narendra Modi inaugurated the Jal-Jan campaign, organised jointly by the Brahma Kumaris organisation and the Ministry of Jal Shakti.

Important Points

- The Prime Minister highlighted that water scarcity is seen as a future crisis and 'water security' is the responsibility of everyone.
- He also stressed the fact that if there is water then only there is a future.
- He mentioned, To secure the future, we will have to make efforts from today itself.
- Today the country is looking at water as a hope for tomorrow.
- PM is satisfied to know that the country is now taking forward the initiatives of water conservation in the form of a mass movement.
- PM stated that initiatives like the Jal-Jan campaign, taken forward by the Brahma Kumaris organisation, will give new strengths to the water conservation movement in India.
- The Prime Minister also elaborated that the Ganga river is getting cleaner and its tributaries are also getting free of pollution.
- Campaigns like natural farming have also started on the banks of the Ganges. Like water pollution, the depleting groundwater table is also a big challenge for the country
- During the occasion, he highlighted his relations with the Brahma Kumaris and said their spiritual movement is inspiring.

Know about Jal-Jan Abhiyan

- The Jal-Jan Abhiyan, inaugurated by PM Narendra Modi is a joint initiative of the Ministry of Jal Shakti and Brahma Kumaris organisation.
- It has been launched with the aim to promote water conservation to save humans and humanity.
- The campaign will increase public participation as water conservation can only be achieved by creating collective consciousness among the people.

Brahma Kumaris

- The organization originated in Hyderabad, Sindh (today the place is in Pakistan).
- Today the headquarters of the organization is located in Mount Abu, Rajasthan.
- The founder of the organization was Lekhraj Kriplani.
- Today he is called the OM BABA.
- The organization is spread across different parts of the world.
- In 1980, the organization registered with the UN Department of Public Relations.
- In 1983, it received "Consultative Status" from UNESCO

Mission Antyodaya Survey 2022-23

Why in News

The Antyodaya mission was launched to aid people in rural areas.

Important Points

- The Union Minister for Rural Development and Panchayati Raj Shri Giriraj Singh said that Mission Antyodaya Survey, brainchild of Prime Minister Narendra Modi will ultimately succeed in realizing the dream of a poverty-free India.
- Inaugurating the Mission Antyodaya Survey (MAS) 2022-23 including launching of its portal and mobile application at a function in New Delhi.
- The Mission will ensure effective utilization of resources through convergence of various government schemes with a focused micro plan for sustainable livelihood for each marginalized household.
- The objectives of the scheme are- conducting an annual survey at the Gram Panchayat level to monitor the progress in the development process in rural areas, Panchayat wise ranking based on the data collected through survey at Gram Panchayat level and making gap report.
- The Gap Report serves as an important input for the Gram Panchayat Development Plan (GPDP).
- The Mission Antyodaya Survey 2022-23 Survey will be conducted in all 2,69,253-gram panchayats and equivalent, whose profile has been created on e-Gram Swaraj.
- However, Tripura, Meghalaya and Nagaland are not covered yet due to elections.
- The Survey-2022 Questionnaire has 183 indicators and 216 data points covering 21 areas. The 21 sectors being covered in the M A Survey are: (i) good governance; (ii) agriculture and land development, fuel and fodder; (iii) animal husbandry; (iv) fisheries; (v) rural housing; (vi) water and environmental sanitation; (vii) roads and communications; (viii) conventional and non-conventional energy; (ix) financial and communication infrastructure; (x) markets and fairs; (xi) the Public Distribution System; (xii) library; (xiii) recreation and sports; (xiv) education/vocational education; (xv) health, nutrition, maternal and child development and family welfare; (xvi) welfare of weaker sections; (xvii) poverty alleviation programme; (xviii) Khadi, village and cottage industries; (xix) social forestry; and (xx) Small scale industries.
- The Department of Rural Development has been conducting Mission Antyodaya Survey across all Gram Panchayats in the country since 2017-18 with the purpose of transforming lives and livelihoods of people on measurable outcomes through convergence of various schemes.
- Annual survey in Gram Panchayats across the country is an important aspect of Mission Antyodaya framework.
- The survey aims to lend support to the process of participatory planning for Gram Panchayat Development Plan (GPDP) which will improve service delivery, enhance citizenship, create pace for an alliance of people's institutions, and groups and improve governance at the local level.

- The village-wise survey is expected to be conducted over a period of one month involving Community Resource Persons (CRPs). The survey questions have been categorized into five stratums: (i) Panchayat Infrastructure; (ii) Panchayat Services; (iii) Village Infrastructure; (iv) Village Services; and (v) Village Practices.
- India is a signatory to the United Nations' Sustainable Development Agenda 2030 under which 17 Sustainable Development Goals (SDGs) have been adopted.
- SDG is not only an international obligation, but also a means of reorienting the domestic expenditure priorities of all signatory countries.

Pudhumai Penn Scheme 2023

Why in News

Tamil Nadu Government launched "Pudhumai Penn Scheme" for girl students.

Important Points

- Tamil Nadu chief minister M K Stalin in presence of Arvind Kejriwal launched the Moovalur Ramamirtham Ammaiyar Higher Education Assurance scheme also known as Pudhumai Penn Scheme in 2022.
- The scheme aims to provide financial help to female students enrolled in government institutions and also encourages girls to pursue higher education.
- The scheme not only acts as a tool to empower women but also helps to fight the social norms prevailing in a society like a child marriage.
- Through the scheme families coming from economically weaker sections of society who can not afford the higher education of their girl child will be greatly benefited.

Under Pudhumai Penn:

- Pudhumai Penn scheme, girl students, who studied from Class V to Class XII in state government schools would be paid monthly assistance of Rs 1,000 till they complete their graduation or diploma.
- The scheme aims to benefit six lakh girls every year and Rs 698 crore has been allocated in the budget for its implementation.
- Stalin said after his government came to power, keeping in mind changing needs, the Moovalur Ramamirtham Ammaiyar Marriage Assistance scheme was converted into the Moovalur Ramamirtham Ammaiyar Higher Education Assurance scheme, now implemented as the Pudhumai Penn scheme, for the benefit of economically-weaker families who are not able to send their girl children to colleges due to financial constraints.
- Stalin also said Rs 25 crore will be allocated to Bharathi Women's College for constructing new classrooms and developing infrastructure facilities.

Mukhyamantri Tirth Darshan Yojana

Why in News

The Scheme was launched by the Madhya Pradesh Government.

Important Points

- Madhya Pradesh, a state located in central India, is well known for its rich cultural heritage and spiritual significance.
- The state is home to several ancient temples, shrines, and holy places that attract devotees from across the country.
- To promote religious tourism and encourage people to visit these spiritual destinations, the Madhya Pradesh government has launched the Mukhyamantri Tirth Darshan Yojna.

What is Mukhyamantri Tirth Darshan Yojna?

- The Mukhyamantri Tirth Darshan Yojna is a state-sponsored pilgrimage tour that allows citizens to visit several religious destinations within the state.
- The main objective of the scheme is to provide an opportunity for people to experience the spiritual and cultural richness of Madhya Pradesh and to promote the development of religious tourism in the state.

- Under the Mukhyamantri Tirth Darshan Yojna, the Madhya Pradesh government provides free transportation, accommodation, and meals to eligible citizens.
- The scheme is open to senior citizens above 60 years of age, differently-abled individuals, and economically weaker sections of society.
- The government has also made arrangements for the medical facilities and security of the pilgrims during their journey.
- The Mukhyamantri Tirth Darshan Yojna covers several spiritual destinations across Madhya Pradesh, including Ujjain, Omkareshwar, Maheshwar, Amarkantak, Pachmarhi, and Chitrakoot.
- These destinations are known for their ancient temples, natural beauty, and rich cultural heritage.
- The pilgrims can visit these destinations and experience the spiritual and cultural richness of Madhya Pradesh.

Guidelines For Chief Minister Teerth Darshan Yojna

- In order to ensure that the journey is safe and pleasant for everyone, the government has set some guidelines that should be followed.
- The first step to participating in the scheme is to fill out the application form, which should be filled out in Hindi by the applicant.
- The form should also have a colored passport-size photograph of the applicant affixed to it.
- Additionally, it is mandatory to provide a mobile number and residential address of a concerned person in case of an emergency.
- It is important for the participants to have good conduct during the journey. This includes sharing your travel experiences and stories with others, as well as following the instructions of the Liaison Officer, Supervisor, or Escort during the journey.
- Inflammable substances and intoxicants are strictly prohibited during the journey, as are valuable gems or jewelry.
- The participants should also be mindful of their behavior during the pilgrimage, as it is requested that they do not indulge in any behavior that tarnishes the image of the state.
- They should carry weather-appropriate clothing and personal items such as blankets, sheets, towels, soap, comb, shaving kit, medicines, etc.
- It is also mandatory to carry identity proof like Aadhaar Card or Voter Card during the journey. The Covid protocol should also be compulsorily followed during the journey.
- The state government or its officers or employees will not be responsible for any accidents or difficulties that may occur during the pilgrimage.
- These guidelines should be followed in order to ensure a safe and pleasant journey for everyone under Chief Minister Teerth Darshan Yojana. The state government is committed to providing its citizens with a memorable pilgrimage experience.

Eligibility for Mukhyamantri Tirth Darshan Yojna

- In order to be eligible for the Mukhyamantri Teerth Darshan Yojana,
- The applicant must be a native of Madhya Pradesh, not be an income taxpayer, and must have completed 60 years of age, with a relaxation of 2 years in the case of women (58 years of age).
- There is no age limit for disabled citizens with a disability of more than 60 percent.
- The pilgrimage can be made by forming a group, with the head of the group being the main applicant.
- The group should not exceed 25 people.
- The applicant should be physically and mentally fit for the journey, and should not be suffering from any infectious diseases.
- A medical certificate stating that the applicant is physically and mentally fit and not suffering from any infectious disease is mandatory to travel.
- Single pilgrims above 65 years of age and 60 percent of disabled citizens are eligible to take a helper (caretaker) during the pilgrimage.

Pilgrim Sites Included in the Scheme

- Vaishno Devi Temple: Located in Jammu and Kashmir, this temple is dedicated to the Hindu deity Vaishno Devi and is considered one of the most revered pilgrimage sites in India.

- Jagannath Temple: This temple, located in Puri, Odisha, is dedicated to the Hindu deity Jagannath and is one of the four holy shrines of India.
- Tirupati Balaji Temple: This temple, located in Andhra Pradesh, is dedicated to Lord Venkateswara and is considered one of the richest temples in the world.
- Amarnath Temple: This temple, located in Jammu and Kashmir, is dedicated to Lord Shiva and is known for its ice lingam, which symbolizes the deity. The temple can only be reached after a challenging trek and is open for a limited period each year.
- Kedarnath Temple: This temple, located in Uttarakhand, is dedicated to Lord Shiva and is one of the twelve Jyotirlingas in India. The temple is located in the Himalayas and can only be reached by a difficult trek.

NAMASTE scheme

Why in News

In the Union Budget 2023, the Government of India allocated Rs 100 crores for the NAMASTE scheme.

Important Points

- With this scheme, the GoI aims to mechanize septic tank cleaning and sewer cleaning in towns and cities. The scheme aims to provide an alternate livelihood to sanitation workers.
- In addition, NAMASTE will strive to bring behavioral changes to them.
- The process of extending the Scheme to all the Urban Local Bodies (ULBs) of the country has been initiated.

What is the NAMASTE Scheme?

- It was launched in 2022 as a Central Sector Scheme.
- The scheme is being undertaken jointly by the Ministry of Housing and Urban Affairs and the Ministry of Social Justice & Empowerment (MoSJE) and aims to eradicate unsafe sewer and septic tank cleaning practices.

Objectives:

- Zero fatalities in sanitation work in India.
- All sanitation work is performed by skilled workers.
- No sanitation workers come in direct contact with human faecal matter.
- Sanitation workers are collectivised into Self Help Groups (SHGs) and are empowered to run sanitation enterprises.
- Strengthened supervisory and monitoring systems at National, State and Urban Local Body (ULB) levels to ensure enforcement and monitoring of safe sanitation work.
- Increased awareness among sanitation services seekers (individuals and institutions) to seek services from registered and skilled sanitation workers.

Key Features of the Scheme to be Implemented in all ULBs

- Identification: NAMASTE envisages identifying the Sewer/Septic Tank Workers (SSWs).
- Occupational Training and distribution of PPE Kits to SSWs.
- Assistance for Safety Devices to Sanitation Response Units (SRUs).
- Extending Health Insurance Scheme Benefits to identified SSWs and their families under the Ayushman Bharat- Pradhan Mantri Jan Arogya Yojana (AB-PMJAY).
- Livelihood Assistance: The Action Plan will promote mechanization and enterprise development by providing funding support and subsidy (capital +interest) to the sanitation workers, to procure sanitation related equipments.
- IEC (Information Education and Communication) Campaign: Massive campaigns would be undertaken jointly by the ULBs & NSKFDC (National Safai Karamcharis Finance & Development Corporation) to spread awareness about the interventions of NAMASTE.

How will NAMSTE be implemented?

- In phase 1, 500 cities are taken. GoI is planning on choosing AMRUT cities first. Also, the first target will be cities whose population is more than one lakh.
- Ten cities from islands, hilly regions, and tourist destinations will be picked. Bringing changes in tourist destinations in the sewerage sector is very difficult.
- This is because the carrying capacity of the tourist spots is high. For this reason, the numbers in the tourism sector are very less.

The Pen Memorial of Tamil nadu

Why in News

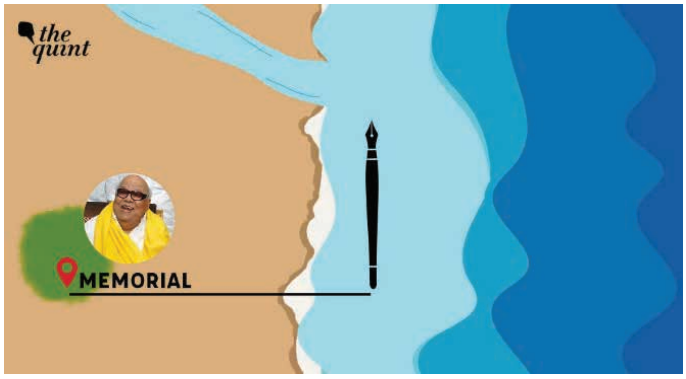
Tamil Nadu's proposed Pen Monument to Karunanidhi's memory was opposed by representatives of some opposition parties and fishermen's and environmental groups on grounds of environmental damage.

Important Points

About the monument

- The Pen Memorial pays tribute to Karunanidhi, one of the most influential figures in Tamil Nadu and Dravidian politicc.
- Karunanidhi, apart from being president of the DMK from 1969 to 2018 and Chief Minister of Tamil Nadu for five terms between 1969 and 2011, made significant contributions to Tamil literature as an orator, poet, and writer of non-fiction and fiction, plays, and films.
- The memorial in the shape of a pen represents his many contributions to Iyal (poetry and literature), Isai (music), and Naadagam (theatre), the three fundamental pillars of both ancient and contemporary Thamizh, or Tamil.
- The design of the monument is based on the Veena, a traditional Carnatic music instrument that is handmade in Tamil Nadu with extreme precision.
- The Thumba is used to represent the pen pedestal, the neck portion of the long bridges, the music hole, a pen statue, and the peg the tensile canopy seating on the bridge.
- The frets are used to represent the distance between the bridge's columns, and the strings are used to represent the Meru or Kudira.
- The design for the landscaped garden on the memorial pedestal is inspired by Sikku Kolam, a traditional drawing made by Tamil women in their homes, in which a geometric shape is created using dots and circles. Locally procured granite will be used for the memorial.
- The proposed 'Muthamizh Arignar Dr Kalaignar Pen Monument' off Marina the beach falls under Coastal Regulation Zones (CRZ) IA, II, and IVA, and requires clearance under Section 4(ii)(j) of the Union Environment Ministry's Coastal Regulation Zone Notification, 2011 (amended up to March 22, 2016).
- The Rs 81-crore 'Pen Monument', standing in the Bay of Bengal 360 m from the coast, was proposed by the government 2022, and is expected to become a Chennai landmark on completion.
- It has been planned as a representation of Tamil culture and architecture, and will incorporate regional motifs, architecture, and designs with Tamil heritage elements.

The Access Bridge



- The idea of a monument on water derives from the metaphorical catamaran to which Karunanidhi compared himself.
- The monument will be 42 metres tall and 2.60 metres in diameter, and will be accessible by a lattice bridge from the existing Karunanidhi memorial on Marina beach.
- Two hundred and ninety metres of the 650-metre bridge will be above land (the Marina seashore), the remaining portion will be above water. There will be wave patterns on the parapet walls of the bridge.
- The floor of the bridge will be made of non-slip material such as rough semi-polished granite to make walking safe even in the rainy season.

Operation Sadbhavana

Why in News

As part of 'Operation SADBHAVANA', Indian Army is undertaking multiple welfare activities such as running Army Goodwill Schools, Infrastructure Development Projects and Education Tours etc. for the children living in remote areas of Union Territory (UT) of Ladakh.

Important Points

What is Operation Sadbhavana?

- Operation Sadbhavana (Goodwill) is an unique humane initiative undertaken by Indian Army in the Ladakh, Jammu & Kashmir to address aspirations of people affected by scrooge of terrorism, sponsored and abetted by Pakistan.
- It was launched by the Indian Army in 1998.
- The focus of Operation Sadbhavana is to improve the overall core social indices of Education, Women & Youth Empowerment, and Health care with simultaneous thrust on capacity building through implementation of community/infrastructure development projects.

- The underlying theme is to blunt Pakistan sponsored anti India propaganda and facilitate all around development of the State based on a participative model involving the local people, Army and the civil administration.
- Accordingly, the core of Operation Sadbhavana theme gyrates around aspirations of local populace and India's national interest.
- Operation SADBHAVANA' projects are selected after taking local aspirations into consideration, in conjunction with local civil administration and it is ensured that there is no duplicacy with projects of civil administration.

Surveillance Balloon

Why in News

The US military has downed the suspected Chinese spy/surveillance balloon over the Atlantic Ocean.

Important Points

About spy/surveillance balloon

- A spy balloon is literally a gas-filled balloon that is flying quite high in the sky, more or less where commercial airplanes fly.
- It has some sophisticated cameras and imaging technology on it, and it's pointing all of those instruments down at the ground.
- It's collecting information through photography and other imaging of whatever is going on down on the ground below it.
- Most of these balloons literally go where the wind blows. There can be a little bit of navigation, but there are certainly not people aboard them. They are at the mercy of whatever the weather is.
- They sometimes have guiding apparatus on them that change a balloon's altitude to catch winds going in particular directions
- There is an internationally accepted boundary called the Kármán Line at 62 miles (100 kilometers) altitude which limits a nation's airspace.

Why would someone want to use a spy balloon instead of just using spy satellites?

- Satellites are the preferred method of spying from overhead. Spy satellites are above us today, typically at one of two different types of orbit.
- The first is called low Earth orbit, and, as the name suggests, those satellites are relatively close to the ground. But they're still several hundred miles above us.

- For imaging and taking photographs, the closer you are to something, the more clearly you can see it, and this applies to spying as well.
- The satellites that are in low Earth orbit have the advantage that they're closer to the Earth so they're able to see things more clearly than satellites that are farther away.
- The disadvantage these low Earth orbit satellites have is that they are continually moving around the Earth.
- It takes them about 90 minutes to do one orbit around the Earth. That turns out to be pretty fast in terms of taking clear photographs of what's going on below.
- The second type of satellite orbit is called geosynchronous orbit, and that's much farther away. It has the disadvantage that it's harder to see things clearly when you're very, very far away.
- But they have the advantage of what we call persistence, allowing satellites to capture images continuously.
- In those orbits, you're essentially overlooking the exact same piece of ground on the Earth's surface all the time because the satellite moves in exactly the same way the earth rotates – it rotates at the exact same speed.
- A balloon in some ways gets the best of those. These balloons are much, much closer to the ground than any of the satellites, so they can see even more clearly.
- And then, of course, balloons are moving, but they're moving relatively slowly, so they also have a degree of persistence.
- Surveillance balloons can also be capable of "gathering electronic signals" and intercepting communications.
- However, spying is not usually done these days with balloons because they are a relatively easy target and are not completely controllable.

Hyderabad hosts the first-ever E-Prix race(Formula E)

Why in News

The first-ever ABB FIA Formula E World Championship race in India took place in Hyderabad.

Important Points

About Formula E World Championship

- E-Prix is the electric equivalent of a Formula 1 race.
- Essentially this is the pinnacle of electric motorsport, with Hyderabad now becoming the 30th location to host an E-Prix.
- They flew across the 2.83km long Hyderabad track alongside the Hussain Sagar Lake and NTR Gardens, with 18 corners designed to take advantage of Formula E's enhanced regenerative braking.
- The 'E' in Formula E stands for electric – with the entirety of the racing car powered by a battery.
- Formula 1 did introduce a hybrid motor in 2014, and in attempts to 'greenify', it's aiming for carbon neutral synthetic fuels from 2026. But F1 still is fundamentally a non-electric sport.
- The other major difference is Formula E has a common spec for all its teams and drivers – the same chassis and battery.
- The ABB FIA Formula E World Championship is accelerated by Greenko – an energy transition and decarbonization solutions provider.

What is a Formula One race?

- Formula One (more commonly known as Formula 1 or F1) is the highest class of international racing for open-wheel single-seater formula racing cars sanctioned by the Fédération Internationale de l'Automobile (FIA).
- The FIA Formula One World Championship has been one of the premier forms of racing around the world since its inaugural season in 1950.
- The word formula in the name refers to the set of rules to which all participants' cars must conform to.A Formula One season consists of a series of races, known as Grands Prix.

- Grands Prix take place in multiple countries and continents around the world on either purpose-built circuits or closed public roads.
- A points system is used at Grands Prix to determine two annual World Championships: one for the drivers, and one for the constructors (the teams).
- Each driver must hold a valid Super Licence, the highest class of racing licence issued by the FIA, and the races must be run on tracks graded "1", the highest grade-rating issued by the FIA for track.

Feathering

Why in News

A preliminary report by the Aircraft Accident Investigation Commission of Nepal on the crash of a Yeti Airlines ATR 72-500 on January 15 in Pokhara says that the propellers of the plane were found in an unusual "feathered" position.

Important Points

What is feathering?

- During engine failure or an engine shutdown mid-air, a pilot flying an aircraft with variable-pitch propellers is able to change the pitch/ angle of the propeller blades so that they slice the airflow in a more or less parallel motion like a knife and not hit the air flatly.
- This has the effect of reducing the 'drag', increasing the gliding distance, and preventing airspeed from decaying below unsafe limits. This is called the 'feathering' of propellers.
- In fact, 'feathering' is part of the checklist if the crew, faced with an emergency, of such aircraft is planning a forced landing.
- 'Windmilling' propellers, unless 'feathered', can worsen an emergency during an engine failure at low heights.
- However, if the aircraft is quite high, the 'windmilling' nature of propellers, rotated by the force of air, can in fact help restart a failed engine. There are specific checklists for this.

Various types of propeller engines

- Fixed-pitch propeller: As the name suggests, the angle or pitch at which the propeller blades meet the airflow is fixed. The blade angle or pitch cannot be changed.
- Adjustable-pitch propeller: In this type, the propeller pitch can be changed but only on the ground, physically — not while the aircraft is in flight.
- Variable-pitch propeller: Both the fixed-pitch and adjustable-pitch propeller types have their limitations. Pilots wanted different propeller pitches for takeoff, climb, cruise, etc. — a small blade pitch is ideal for takeoff, medium pitch for climb and high pitch for cruise. They also wanted propellers whose pitch could be changed from the cockpit during the flight.
- This was achieved by the variable-pitch propeller. As the name suggests, the propeller pitch could be changed by the pilot from the cockpit to suit flight conditions.
- Constant-speed propeller: This is a more advanced variable-pitch propeller, in which the blade pitch changes automatically to maintain a constant aircraft speed.

What happens when the propellers stop functioning?

- During engine failure or an in-flight engine shutdown, the affected engine no longer produces 'thrust' , the power that propels the aircraft forward. The pilot faces another problem as well.
- The air hitting the giant 'windmilling' propeller blades produces enormous 'drag' — a force that acts in the opposite direction of 'thrust'.
- With no or reduced 'thrust' as a result of the engine malfunctioning or having shut down, and enormous 'drag', the glide performance and airspeed of the plane can be severely impaired.

North India's first nuclear plant

Why in News

North India's first Nuclear Plant is coming up in Haryana in the town of Gorakhpur, which is about 150 km north of the national capital of New Delhi.

Important Points

- Gorakhpur Haryana Anu Vidyut Pariyojana(GHAVP) having two units of 700 MWe capacity each of Pressurised Heavy Water Reactor (PHWR) indigenous design is under implementation near Gorakhpur village in Fatehabad district in Haryana.
- Till date, an amount of ₹4,906 Cr has been spent out of total allocated funds 20,594 Cr. (Total Financial progress is 23.8% as on date).
- Purchase orders for major long manufacturing cycle equipment/components like Primary Coolant Pumps, Calandria, Reactor Headers, Refuelling Machines Heads, Moderator and other D20 Heat Exchangers, etc. are already in place.
- End Shields and all Steam Generators for the first unit have been received at site.
- Construction of Water Duct from Tohana to GHAVP for meeting operational cooling water requirements has been taken up through Haryana Irrigation & Water Resources Department (HI&WRD) as deposit work and progressing well.

Major Nuclear reactors in India

The Kudankulam Nuclear Power Plant (KKNPP)

- It is the largest nuclear power station in India, situated in Kudankulam in the Tirunelveli district of the southern Indian state of Tamil Nadu.
- Construction on the plant began on 31 March 2002, but faced several delays due to opposition from local fishermen.
- KKNPP is scheduled to have six VVER-1000 reactors built in collaboration with Atomstroyexport, the Russian state company and Nuclear Power Corporation of India Limited (NPCIL), with an installed capacity of 6,000 MW of electricity.
- Russia is building the KKNPP under an Inter-Governmental Agreement of 1988 and follow-on agreements in 1998 and 2008.

Tarapur Nuclear Reactor

- Located in Maharashtra, it is the oldest nuclear facility in India, having commenced commercial operations in 1969.
- It is currently the second most powerful in India, with two BHWR of 160MW and two PHWR reactors of 540MW forming a total of 1,400MW.
- The nuclear plant is the result of New Delhi's collaboration with the US.

Rawatbhata Atomic Power Plant

- Located in Rajasthan, it has a total installed capacity of 1180MW. Formed of six PHWR reactors with two more reactors planned, the first reactor was commissioned back in December 1973.
- Earlier India collaborated with Canada for this plant.
- In 1974 after India conducted Smiling Buddha, its first nuclear weapons test Canada stopped their support of the project.

Kaiga Atomic Power Plant

- Located in Karnataka, it is formed of four 220MW PHWR reactors making a total of 880MW.
- The plant has been in operation since March 2000 and is operated by the Nuclear Power Corporation of India Limited (NPCIL).

Kalpakkam Nuclear Power Plant

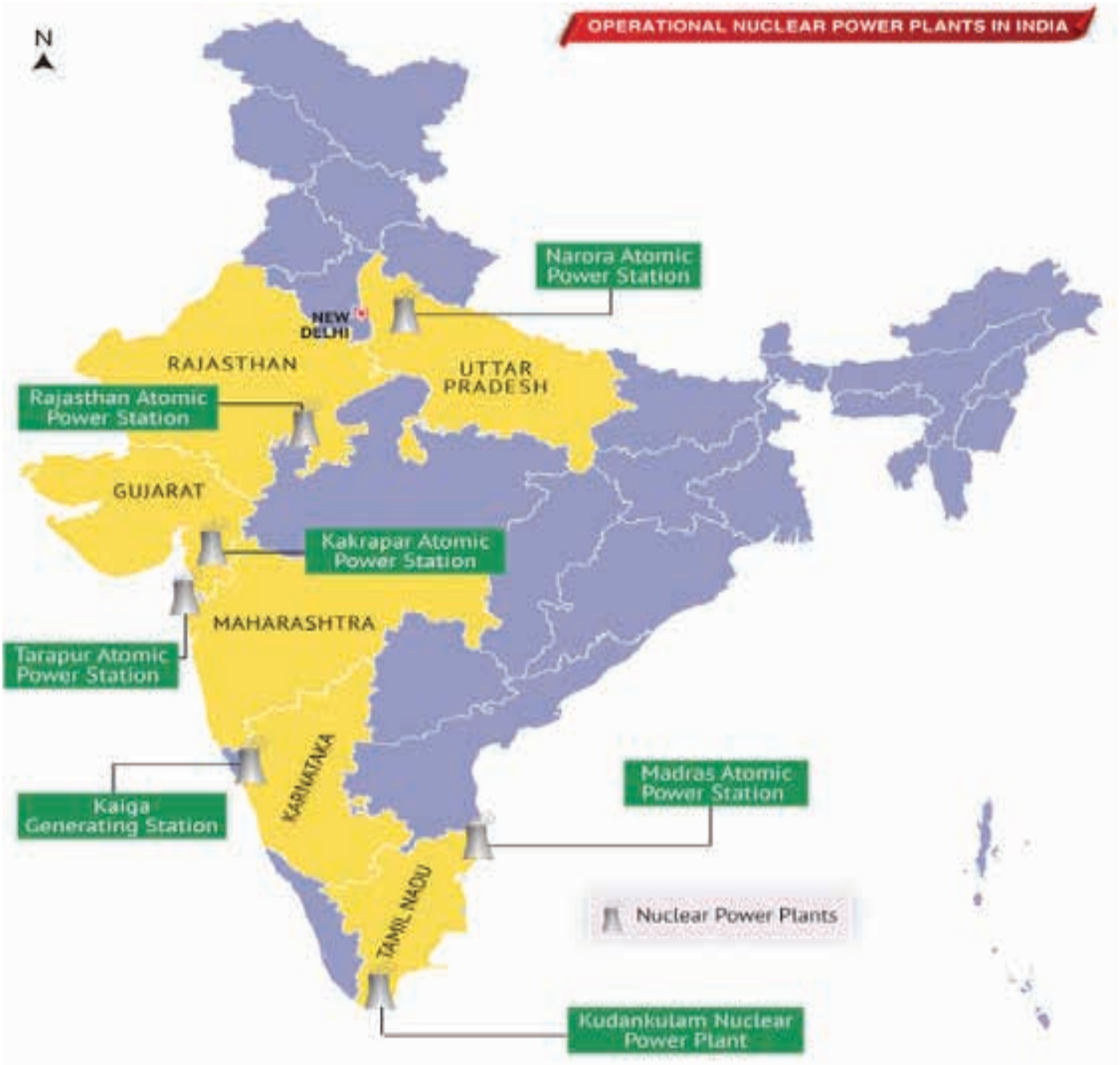
- Located in Tamilnadu, it first began operating in 1984 and currently has two 235MW reactors, with two more reactors of 500MW and 600MW to be added at a later date.
- It has a prototype fast breeder reactor (PFBR) which does not produce highly radioactive nuclear waste and can produce 70% more energy.

Narora Nuclear Reactor

- Located in Uttar Pradesh, it has two PHWR which offer a total capacity of 440MW.
- It is considered one of the safest nuclear plants in the country and won a Golden Peacock award for environment management in the year 2000.

Kakrapar Atomic Power Plant

- The power plant in Gujarat, Western India has two PHWR reactors with a total installed capacity of 440MW.
- It is developed and operated by NPCIL.



Chapter-
10

GIST OF YOJANA FEBRUARY 2023: YOUTH AND SPORTS

1. Initiatives for New India

- India has one of the youngest populations in the world, as 27.2% of the country's population belongs to the age group of 15-29 years.
- The future of the country depends on its youth, who are also essential for social and sociological transformation, technological advancement, and economic growth.
- The government is pursuing many actions to engage youngsters in nation-building and equip them with the necessary skills to compete in international labour markets.
- The Indian government has stated repeatedly that the "Jan Bhagidari se Jan Andolan" is incomplete without the involvement of young people.

Various initiatives taken by the government for the Youth

- The Ministry of Youth Affairs and Sports (MoYAS) directed Nehru Yuva Kendra Sangathan to organise various Swachh Bharat 2.0 programme activities.
- Youth volunteers are being recruited by MoYAS to help with nation - and personality-building.
- For the 14000 youth volunteers of NYKS, a capacity building training programme was also created.
- Also, a new National Education Policy 2020 was introduced to improve the Indian educational system.
- In order to encourage youth to actively participate in the FIT India initiative, universities and other educational institutions are modernising their sports facilities. It will increase stamina and physical fitness while lowering carbon footprint.

Sports, Education, and Youth development

- Sport is a fantastic equaliser and unifier. Regardless of cultural, linguistic, or geographic variations, it is a crucial element for societal harmony.
- It is past time for society to acknowledge sports as a desirable and lucrative career path.
- The Khelo India Program was established to support athletes and improve the nation's sports ecosystem. Among other things, it organises the Khelo India youth games and the winter games every year.
- The Khelo India programmes developed state centres of excellence and Khelo India Centers at the district level.
- The programme also includes a strong structure for early talent identification and development. Training, travel, diet, medical costs, and out-of-pocket expenses are all covered financially.
- To identify sports talent at a young age, nearly 23 lakh school students (in the age group of 5 to 18 years) are assessed through Khelo India Mobile App. Moreover, nearly 83000 physical education teachers have been trained to assess the sporting prowess of children.
- As a part of Azadi ka Amrit Mahotsav, the FIT India quiz (the biggest quiz on sports) was organized.

Way Ahead

- According to the infrastructure, talent pool, and local interest, states can be encouraged to adopt programmes like "One State, One Sport" and give priority to one sport.
- Indian society should adopt a sporting culture.
- At the local, district, and state levels, there should be more leagues, tournaments, and competitions.
- Youth should be guided into international platforms by the government.

Conclusion

- A youthful mind, body and soul is the key to a healthy and fit India. The youth of a nation is the most progressive section and has the most crucial role in the vision of New India.

2. Nurturing Excellence of Our Yuva Shakti

- The working-age population in India, or those aged 15 to 64, makes up 67% (or 80 crores) of the overall population, or the demographic dividend.
- Due to its demographics, the years 2020 to 2050 are seen as the Indian economy's "golden" years.
- Because there are an average of 1.2 crore new workers entering the workforce each year, the government's role and responsibilities are even more crucial for fostering entrepreneurship, enhancing public services, building infrastructure, integrating technology, and protecting workers.

India's Startup Ecosystem

- The third-largest startup ecosystem in the world is found in India.
- India claims one of every 10 unicorns on the planet. Incidentally, India had just 4 unicorns in 2014, but by 2022, that number would have risen to over 100.
- India submitted about 4000 patents worldwide in 2014. In 2022, it was around 15,000 people.
- India rose in the "Global Innovation Index," moving up from position 81 in 2015 to number 40 in 2022.
- There are currently about 77000 government-recognized startups spread in nearly 656 districts of the nation.
- The availability of data, outreach and marketing services, ease of doing business, and decreased compliance are the driving forces behind an effective and sustainable startup ecosystem in India.

Conclusion

- It is the youth of the country that will enable India to realize its full potential and dreams.
- Ways and means should be formed to tap the energy and ambition of the youth.

3. FIT India: Towards a Healthy Future

- With the enhancement of physical and psychological wellbeing, sports promote holistic development. Moreover, it enhances mental faculties.
- Students gain a solid understanding of core values through athletics, including cooperation, discipline, teamwork, fair play, and tolerance.
- It further encourages cultural and community togetherness. Also, it is necessary for participation in future group activities and in the workforce.
- It promotes both social and individual growth.
- Integrating sports into the classroom boosts productivity, strengthens human capital, and promotes peace.
- As a result, the National Education Policy (NEP) 2020 places a strong emphasis on integrating sports into educational strategies that make use of physical activities, especially indigenous sports.

FIT India Movement

- The FIT India movement was launched on 29 August 2019 to make fitness an integral part of daily life.
- The vision of FIT India is to bring about behavioural changes and move towards a more physically active lifestyle.
- The goals and objectives of this are:
- To promote fitness as an easy, fun, and free activity.
- To spread awareness on fitness and various physical activities that promote fitness through focused campaigns.
- To encourage indigenous sports.
- To make fitness reach every school, college/university, panchayat/village, etc.
- To create a platform for citizens of India to share information, drive awareness, and encourage sharing of personal fitness stories.

Initiatives undertaken to promote FIT India Movement

- Samagra Shiksha Scheme
- FIT India Quiz
- FIT India Freedom Run

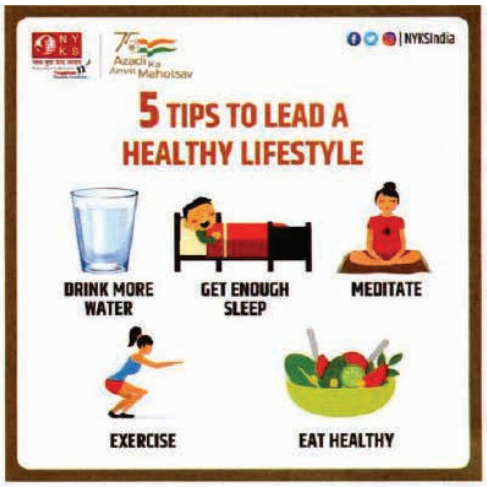
- Football for Schools Programme

Conclusion

- The sporting landscape of India has changed due to various efforts of the government. Sports has become an important component of socio-economic development.
- All the initiatives in the past few years have changed the mindset around sports and are promoting lifelong learning and leadership qualities among young kids.

4: Youth and Health

- Being the most productive age group, youth contributes immensely to the economic growth of the country.
- However, the younger generation faces many health issues due to their physiological state, behaviours, diet, work, etc.
- India has been ranked 8th among countries with the lowest physical activity globally.
- Moreover, reports show that 3 out of 4 adolescents and young individuals are not physically active enough as per the given recommendations.



Health Issues faced by the Youth

- Mental Health
- Alcohol and Drug Use
- Tobacco Use
- Physical Inactivity.
- Diabetes and Hypertension

Box 1: Government Initiatives which aim at Healthier Youth

Sl. No	Programmes/Initiatives	Features
1.	Rashtriya Kishor Swasthya Karyakram (RKSK)	• The programme's main strength is its health promotion approach. • The focus of the programme is shifted from the clinic-based approach to prevention and promotion and reaching the adolescents in their own environment which includes their communities or families or schools.
2.	Adolescent Friendly Health Clinics (AFHC)	• It includes all health issues from sexual and reproductive health to injuries, violence, substance abuse, nutrition, NCDs, etc. • The components of AFHC are acceptable, equitable, accessible, appropriate, comprehensive.
3.	Peer Education Programme	• The selected peer educators have to ensure that the adolescents benefit from RKSK. • These peer educators are called 'Saathiya'. • Four peer educators (two boys and two girls) are selected per village/1000 population/ASHA habitation to reach out to adolescents.
4.	Menstrual Hygiene Scheme	MoHFW launched a scheme for promotion of menstrual hygiene in adolescents. It mainly focuses on increasing the awareness, increasing access and usage of sanitary napkins along with its safe disposal.
5.	Health and Wellness Centres under Ayushman Bharat Programme	The HWCs promote a comprehensive health approach by preventive and promotive interventions.
6.	FIT India	This initiative is aimed at adoption of healthier lifestyle in youth by getting involved in sports and other related activities.
7.	Other Health Programmes	Various health programmes like National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke, (NPCDCS), Reproductive, Maternal, Newborn, Child Plus Adolescent Health (RMNCH+A), National AIDS Control Programme (NACP), National Mental Health Programme (NMHP) and others also strive in improving youth health.

5: Enablers for Employment

- The Ministry of Youth Affairs and Sports (MoYAS) released a Draft National Youth Policy with a 10-year vision for youth development.
- The policy is aligned with the Sustainable Development Goals (SDGs).

The five focus areas of the policy are:

- Education
- Employment and entrepreneurship
- Youth leadership and development
- Health, fitness, and sports
- Social justice

Government interventions for career opportunities

- The Make in India initiative launched in 2014 is helping foster innovation, build world-class infrastructure, and make India a hub for manufacturing and design.
- Rozgaar Mela, a recruitment drive for 10 lakh personnel was launched in a mission mode.
- Karmayogi Bharat was launched, it is a Special Purpose Vehicle (SPV) under the administrative control of the Department of Personnel and Training (DoPT) for capacity building of all government employees. It operates the iGOT (Integrated Government Online Training) Karmayogi platform.
- Karmayogi Prarambh is an online orientation course for all new recruits in various Government departments.
- Pradhan Mantri National Apprenticeship Mela (PMNAM) is a part of the Skill India Mission that provides apprenticeship opportunities.
- Agnipath Scheme is launched by the government to recruit 46000 young people as 'Agniveers' in the armed forces for a four-year term.

6: Youth for Environment Sustainability

- Youth-driven climate action initiatives could help augment the overall quality of education and attain net-zero emissions by 2030.
- Innovative and focused approaches would be required to develop and prepare strategic frameworks, policies, and procedures; monitor land management, crisis, and disaster management; and conserve biodiversity.
- At present, there are 1.8 billion people between the ages of 10 and 24. This is the largest generation of youth in history. Moreover, around 90% of them reside in developing countries.
- The ability, ambition, and creativity of the younger generation should be utilized for sustainable cities and livelihoods.

Roles of Youth and SDGs

- Critical Thinkers
- Change Makers
- Innovators
- Communicators
- Leaders

LiFE Movement

- In the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP26), Glasgow, the Indian Prime Minister proposed the concept of LiFE.
- It promotes an environment-conscious lifestyle that focuses on 'mindful and deliberate utilization' instead of 'mindless and wasteless consumption'.
- It seeks to encourage people to take small and regular steps toward a more sustainable future.
- The mission plans to create and nurture a global network of individuals, namely 'Pro-Planet People' (P3). These individuals will have a shared commitment to adopt and promote environment-friendly lifestyles.

7: Youth Icons of India

- The youth is a vital demography and a vital agent of change and progress.
- They can shape policy, influence markets, and reimagine social structures.
- They are a critical component in realizing the vision of AatmaNirbhar Bharat.

Some of the Youth Icons of India are:

- SUNDAR PICHAI
- SATYA NADELLA
- NAVEEN TIWARI

Some of the Youth icons in the field of Sports

- Sharath Kamal Achanta: He is one of the most outstanding table tennis players in India who was awarded the Major Dhyan Chand Khel Ratna Award in 2022.
- Seema Punia: She received the Arjuna Award 2022 for her brilliant performance in the field of Athletics.
- Neeraj Chopra: He created history by winning India's first-ever athletics gold in men's javelin throw at the Tokyo Olympics in 2020.
- Rameshbabu Praggnanandhaa: He is a teenager who created history by defeating the noted world chess champion Magnus Carlsen of Norway.

8: Leading India towards Techade

- Approximately 66% of the total population in India is below the age of 35. This can be pivotal in propelling economic and societal growth.
- It is imperative to involve youth in participatory governance because they are the future of the country. This will help in building civic capacity and long-term community sustainability.
- To place people at the centre of development, MyGov was launched in 2014. It is a citizen engagement platform that works with various government organizations and ministries to solicit the opinion of the general public.

MyGov

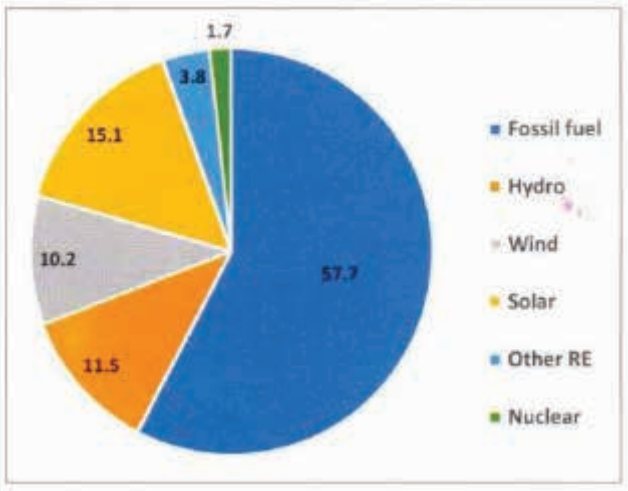
- MyGov has used technology to reach out to the masses. The youth is the backbone of MyGov's outreach platform.
- It facilitates 'Jan Bhagidari' or public participation by:
- Information Dissemination: It helps to reach out to beneficiaries and acts as a one-stop platform for citizens. Effective dissemination of information increases awareness and fosters cooperation.
- Two-Way Communication: It provides two-way communication through social media and innovative platforms.
- Transparency: Through MyGov, the selection process for various awards and schemes has become transparent. Increased transparency fosters accountability and enhances the trust and confidence of the citizens.
- Fact Check: False information can quickly spread and have terrible consequences. MyGov can help citizens to know about facts and government announcements.
- Infusing Collaborations: It enables citizen-citizen and government-citizen collaborations.
- It can act as a great networking platform for individuals who want to bring positive change.
- It facilitates creative disruption and out-of-box ideation.
- The government has involved youth in preparing songs, taglines, jingles, logos, etc.

Chapter-
10

GIST OF KURUKSHETRA FEBRUARY 2023 ISSUE: RENEWABLE RESOURCES

1: Sustainable Development through Renewable Resources

- Sustainable Development, as defined by the United Nations, is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- The scale, spread and pace of development has posed an inevitable challenge of balancing the spirit of human endeavour to conquer new heights without compromising the fundamental principles of sustainable development.



Energy Sector

- As of today, India is consuming about 9000 billion units of energy for various purposes.
- About 47 per cent of the total energy is sourced from coal and lignite, 31 per cent from crude oil, about 15 per cent from electricity (hydro, nuclear and other renewable sources) and 8 per cent from natural gas.

Impact of Fossil Fuels

- The 2022 report of the Lancet Countdown on Health and Climate Change says that the changing climate is affecting the spread of infectious diseases, putting populations at higher risk of emerging diseases and co-epidemics.
- In August 2022, India updated the Nationally Determined Contributions (NDCs) as stipulated in the Paris Agreement.
- This demonstrates India's commitment at the highest level for decoupling of economic growth from greenhouse gas emissions.

Renewable Energy

- India is a power surplus nation with a total installed electricity capacity of over four lakh Mega Watt (MW).
- Today, India is the world's third largest producer of renewable energy, with about 42 per cent of our installed electricity capacity coming from non-fossil fuel sources.
- Estimated renewable energy potential of India (other than large hydro) is about 1.5 million MW, of which 50 per cent is from solar, 46.7 per cent from wind, and the remaining from small-hydro, biomass and waste to energy.

Solar Power

- The last decade has witnessed a surge in the use of solar energy based decentralised and distributed applications.
- Millions of Indians are now using solar power for lighting, cooking, mobility and other energy needs.
- The solar power-based cooking has significantly improved the quality of life, especially of rural women and girl children.
- Easy access to power in remote areas have boosted economic activities and employment opportunities, and thus helped in mainstreaming the underdeveloped zones.

- Estimates by National Institute of Solar Energy suggest that covering three per cent of the waste land area with solar photovoltaic modules can generate about 748 GW power.
- In 2010, Government of India launched National Solar Mission (NSM) with active participation of States to promote sustainable growth while addressing the energy security challenges.

Wind Power

- National Institute of Wind Energy (NIWE) identified seven states viz. Gujarat, Maharashtra, Rajasthan, Tamil Nadu, Madhya Pradesh, Karnataka and Andhra Pradesh with significant potential for power generation from wind.
- The wind potential of these 7 seven states at 100 m above ground level (agl) is 293 GW and the potential at 120 m agl is 652 GW.
- Government has also introduced a waiver of Inter State Transmission System (ISTS) charges for inter-State sale of solar and wind power, for projects to be commissioned by 30 June 2025.
- India, having a natural advantage of a 7500 km long coast line, has the potential of harnessing offshore wind energy.

Hydropower

- Since March 2019 Government of India has been recognising Large Hydro Power Projects (LHPs) including Pumped Storage Projects (PSPs) having capacity of more than 25 MW as part of renewable energy.
- According to the assessment made by Central Electricity Authority (CEA), India has the potential of economically exploitable hydro-power to the tune of 1,48,700 MW.

Bio Fuels

- Ethanol and biodiesel are the two most common types of biofuels in use today.
- The Government has been implementing Ethanol Blended Petrol (EBP) Programme wherein the Oil Marketing Companies (OMCs) sell petrol blended with 10 per cent ethanol.
- The National Policy on Biofuels announced in 2018 is aimed at accelerated promotion of biofuels with indicative targets of achieving 20 per cent blending in Petrol and 5 per cent blending in diesel by 2030.

Ocean and Geo-thermal:

- Ocean energy refers to energy derived from Wave Energy, Tidal Energy, and Ocean Thermal Energy Conversion. The technology development in these areas is at the research and development stage.
- The estimated theoretical power potentials for Tidal and Wave energy are 12,455 MW and 41,300 MW respectively.
- Geothermal Energy is a source of heat stored in the earth's crust, which is manifested on the surface as hot springs.
- In India, Geological Survey of India (GSI) has estimated that a tentative power potential of 10 GW could be extracted from geothermal energy.

Food Security and Renewables

- Ensuring food security is the fundamental pre-requisite for catalysing human centric development.
- Ratio of volume of groundwater extracted every year to the annual ground water recharge, referred to as stage of groundwater development, in the country is 61.6 per cent.
- The stage of ground water extraction is very high in the states of Delhi, Haryana, Punjab and Rajasthan, where it is more than 100 per cent, which implies that in these states the annual ground water consumption is more than annual extractable ground water resources.
- In the states of Tamil Nadu, Uttar Pradesh, Karnataka and Union Territories (UTs) of Chandigarh and Puducherry, the stage of ground water extraction is between 60-100 per cent.
- The decline of the ground water table leads to the consumption of more energy every year to meet the irrigation requirements. Use of renewables plays a major role in ensuring gains for the waterenergy-food nexus.

2: Powering Growth in Agriculture Sector

- Agriculture is the mainstay of the Indian economy contributing nearly 15 per cent to national GDP.
- Agriculture is the primary source of raw materials for some of the major industries such as textile, sugar, food, pharma (mainly Ayurveda) and new age health and fitness products.
- Recently, agriculture has jumped to the 7th position as net exporter, across the globe.

Energy Demand

- Agriculture consumes nearly 20 per cent of the electricity consumed at national level.
- Energy consumption at this high level has raised concern in view of India's commitment to reduce the carbon intensity by less than 40 per cent by 2030 (COP-26).
- Recently, the Government has set a target to make the agriculture sector diesel free by 2024.
- RE(renewable energy) also promises to increase income of farmers and save precious natural resources, mainly water.
- The Government has taken a series of steps to empower farmers with RE systems to make them energy self-sufficient, particularly in irrigating their fields. Various sources of renewable energy such as solar, wind, small hydro, biomass and agricultural wastes are being deployed in rural settings for agricultural purposes.

Biogas

- Biogas plants generate the high calorific value (5,000 kcal per cu.m.) gas by decomposition of organic materials such as cattle dung, agricultural wastes, poultry droppings, night soil and municipal wastes.
- Currently, over five million biogas plants of various capacities are operational in the country ..
- It is also used in diesel engines to substitute diesel up to 80 per cent, however, 100 per cent replacement of diesel may be achieved by using Biogas Engines.
- Government of /ndia is promoting installation of biogas plants by providing subsidy through two major schemes:

(a) New National Biogas and Organic Manure Programme (NNBOMP).
(b) Biogas Power Generation (off-grid) and Thermal Energy Application Programme (BPGTP)

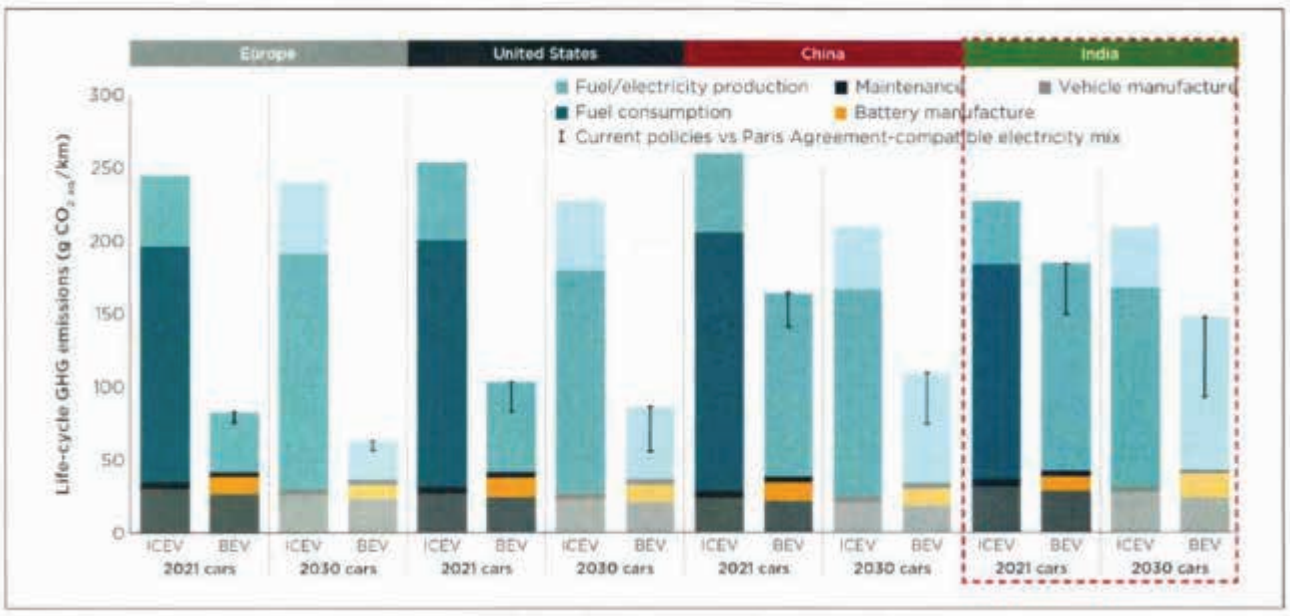
- Government of India has launched a dedicated GOBARdhan (Galvanising Organic Bio-Agro Resources Dhan) scheme (Swachh Bharat Mission Grameen Phase-2) with twin objectives – to make the villages clean and generate clean power from organic wastes.
- CBG is a purified form of biogas (98 per cent purity of methane content) which makes it suitable for use as green and clean fuel for transportation or filling in cylinders at high pressure (250 bar).
- Recently, Asia's largest CBG plant was inaugurated at Sangrur, Punjab with an FD/ investment of Rs. 220 crores.

Solar Energy

- The PM-KUSUM scheme is one of the largest initiatives of the world to provide clean energy to more than 35 lakh farmers and also enhance their income.
- PM-KUSUM will help reduce subsidies required from states for electricity supply to agriculture.
- It will also help boost domestic solar manufacturing mainly to make solar cells and solar modules for which we still depend on imports.
- The scheme will lead to an annual reduction of 1.38 billion litres in diesel consumption per year, thus, reducing the import bill on account of petroleum products.
- The scheme will also lead to reducing carbon emissions by as much as 32 million tonnes per annum.
- MNRE has recently released a framework (2022) to promote RE based applications that are used for earning livelihoods.
- RE based decentralised and distributed applications have benefitted millions of farmers in villages by meeting their energy needs in an environment friendly manner.

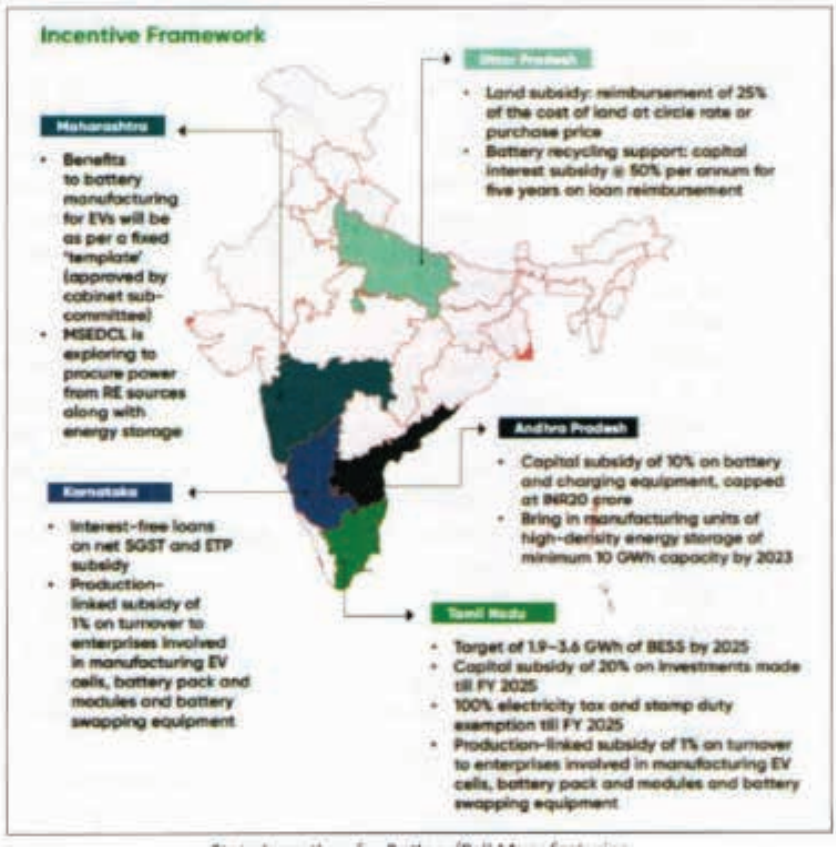
3: Decarbonisation of Transport Sector

- The average carbon footprint of a person in India is 0.56 tonnes per year, compared to the global average of four tonnes.
- India is focussing on catalysing, growing, and fuelling the entrepreneurs in the country to create businesses with clean technologies such as hydrogen, electric mobility, batteries, etc.
- Green technologies are driving sustainable development in India. Such technologies maximise energy efficiency and preserve the environment while saving money'out of many sectors, including steel, railways, shipping, aviation, energy, road transport, etc.



Green technologies in Transport Sector

- India's transport demand is expected to increase by 2.7 times in over 30 years.
- Electric vehicles (EVs) are as green as the electricity powering them and the sustainable supply chain of batteries.
- Lifetime emissions from EVs today are 19-34 per cent lower than ICE cars.
- FAME India Scheme Phase II was focused on public transport, two-wheelers, and three-wheelers.
- Bus transport in India accounts for 38 per cent of passenger km, though its share in overall registered vehicles in India is just around 3.5 per cent.
- Two-wheelers account for 76-80 per cent of the total registered automotive in India.
- Last-mile connectivity mainly depends on three-wheelers and sub-seven-metre buses.
- India is already the biggest manufacturer and most significant market for 2 wheelers globally.



- Electric two-wheelers will also see Mobility on Demand (MoD) and Mobility as a Service (MaaS) models to develop.
- India has a chance also to become the global hub of manufacturing for the entire EV Value chain (except raw material mining).
- Several states have also rolled out the incentives for battery manufacturing.
- Government-led companies such as BHEL / BEL can join hands to develop the local supply chain for chargers manufacturing.
- Research institutions such as IISc and labs CPRI/ CSIR/ARCI can provide further technical support.
- The battery swap stations in rural areas will change the EV adoption and Battery storage landscape.
- These swap stations can serve as micro power grids, which can power the villages/houses in the vicinity and supply the excess power to the grid.

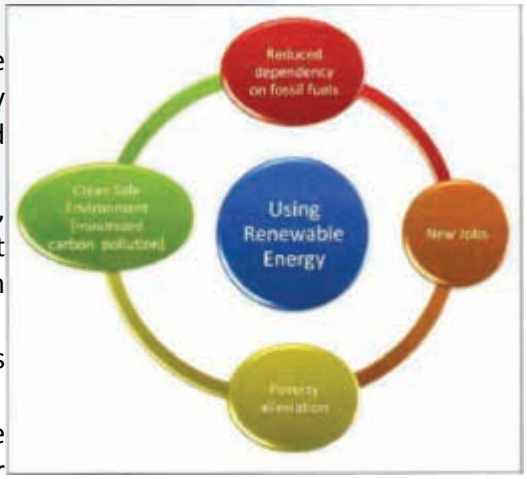
- India also needs a comprehensive mission plan to deal with advanced chemistry cells (ACC) recycling as >95 per cent of the original critical minerals can be recovered from these ACC batteries and reused in cell manufacturing.
- Government should focus on capacity building at all levels, along with upskilling and reskilling with respect to EVs.
- NITI Aayog is working with IITs to nudge them to start EV-specific courses.
- "Shoonya – Zero pollution Mobility" is a consumer and corporate-facing campaign hosted by NITI Aayog.

4: Mitigating Environmental Issues

- Energy consumption accounts for 60 per cent of the total greenhouse gas emissions.
- As per World Energy Outlook 2021 of International Energy Agency (IEA), the current share of India in global primary energy consumption is 6.1 percent.
- Over 80 percent of India's energy needs are met by three fuels: coal, oil and solid biomass..
- Renewable energy technologies could be deployed more rapidly if energy policies addressed both the subsidies and impacts of fossil fuels while facilitating more finance for renewable energy projects.

India's efforts towards mitigating the effects of climate change:

- Long-Term Low-Carbon Development Strategy submitted by India under United Nations Framework Convention on Climate Change (UNFCCC) focuses on the rational utilisation of national resources with due regard to energy security.
- The Ministry of Environment, Forest and Climate Change has two central sector schemes that address climate change.



- The Climate Change Action Plan (CCAP) launched during the 12thFive Year Plan with an outlay of Rs. 290 Cr. to build capacity and support implementation of relevant climate change related actions at the national and State level.
- The National Adaptation Fund for Climate Change (NAFCC), established in August 2015, with the aim of meeting the cost of climate change adaptation for states and union territories in India which are vulnerable to the impacts of climate change.
- India at the COP 26-UNFCCC presented 'Panchamrit' of India's climate action.
- The Union Cabinet has also given its approval to introduce the Production-Linked Incentive (PLI) Scheme in High Efficiency Solar PV Modules for Enhancing India's Manufacturing Capabilities and Enhancing Exports, It aims to reduce import dependence in the area of energy sector.
- Green Energy Corridors is another programme implemented by MNRE in the country to promote renewable energy sources, to create an intra-state transmission system for renewable energy projects.
- Recently, Modhera, a village in Gujarat was declared as India's first solar-powered village. Conversion to a clean.
- The Energy Conservation (Amendment) Bill, 2022 has been passed which focus on the use of non-fossil energy (biomass, ethanol, green hydrogen) to decarbonise IIndian economy.

5: Public Awareness about Renewable Energy Sources

- Energy services are essential in all societies to provide for basic human needs (such as lighting, cooking, space comfort, mobility, and communication) and support productive processes that promote economic development.
- In order to effectively optimise energy structures, balance supply, and demand discrepancies, and safeguard the environment, renewable energy is a crucial part of the energy supply.
- Nearly 80 per cent of the world's population resides in nations that are net importers of fossil fuels, making them susceptible to geopolitical shocks.
- The "Agenda 2030" calls for a path to end extreme poverty, fight inequality and injustice, and protect the planet.
- The target 7.2 of the Sustainable Development Goal calls for a substantial increase in the share of renewable energy in the global energy mix by the year 2030 to ensure access to affordable, reliable, sustainable and modern energy for all.

Renewable Energy-Prospects

- The IEA reports that in 2021, renewable energy sources contributed 28 per cent of the total energy generation worldwide, while coal was used to generate 36.3 per cent.
- Renewable energy sources are expected to account for over 90 per cent of global electricity expansion over the next five years, surpassing coal to become the largest source of global electricity by early 2025.
- China, the European Union, the United States, and India are primarily responsible for the surge in the share of renewable energy sources in the next five years due to their policy responses and market reforms pertaining to green energy.
- The Economic Survey 2021-22 reports that renewable energy contributes to approximately 10.7 per cent of India's power generation, followed by coal.

The Indian Context

- The Department of Non-Conventional Energy Sources (DNES), was created in the Ministry of Energy in 1982.
- In 1992, the Department was upgraded into a separate Ministry of Non-Conventional Energy Sources (MNES) in 1992 and was re-named as Ministry of New and Renewable Energy (MNRE) in October 2006.
- The Ministry is being supported by five institutes, namely, (i) National Institute of Solar Energy (ii) National Institute of Wind Energy (iii) Sardar Swarn Singh National Institute of Bio Energy (iv) Indian Renewable Energy Development Agency (IREDA); and (v) Solar Energy Corporation of India (SECI).
- To enhance efficiency and responsiveness to people and to make people aware, the Ministry has brought out a Citizens'/Clients' Charter (CCC), incorporating its mission, main services/transactions and commitment to its clients and the people of India in general.
- It also aims at addressing problems of the interface between the Ministry and its Clients/ Citizens and also continuously improving the quality of public services for the people at large to make them responsive to their needs and wishes.

Policy and Guidelines:

- As per the Annual Report of 2021-22, a comprehensive policy framework on Renewable Energy Research and Technology Development Programme is in place to support Research and Development in the new and renewable energy sector, including associating and supporting Research and Development earned out by the industry for market development.
- The Ministry provides up to 100 per cent financial support to Government/NGOs and up to 50 to 70 per cent to industry.
- The Budget allotted for Renewable Energy Research and Technology Development (RE¬RTD) Programme is Rs. 228 crores for FY 2021-22 to 2025-26.
- The Pradhan Mantri Kishan Urja Suraksha evam Utthan Mahabhiyaan (PM-KUSUM) is another important scheme in this regard.
- The National Mission on Strategic Knowledge for Climate Change is another initiative to make people aware.

6. Transition to Clean Energy

- Since, emissions of greenhouse gases are one of the primary causes of climate change, nations all over the globe are making concerted efforts to transition to cleaner forms of energy by altering the processes by which energy is generated.
- The term "energy transition" refers to the change that is taking place in the global energy sector away from fossil-based systems of energy production and consumption, such as oil, natural gas, and coal, and toward renewable energy sources such as wind and solar, as well as lithium-ion batteries.
- Renewable energy technologies are called "clean" or "green" since they generate very few pollutants, if any.

Energy Scenario

- India is the world's third-largest consumer of energy.
- Since 2000, energy consumption has doubled, with coal, oil, and solid biomass still supplying 80 per cent of the demand.
- Coal's dominance as an energy source is supported by its strong position in power production and as a commercial fuel (especially heavy industries such as iron and steel).
- In the year 2000, coal met 33 per cent of India's primary energy needs; in the present day, it fulfils 44 per cent of that requirement.
- Traditional biomass was India's second-most important energy source in 2000, accounting for a quarter of the major energy mix.
- Transport energy consumption climbed 3.5 times since 2000 while building demand grew 40 per cent due to increasing appliance ownership and the availability of contemporary cooking fuels.
- Urbanisation and rising affluence have also led to an increased usage of residential appliances, driving up electricity consumption and outpacing total energy demand.
- India has made great progress in electricity access in recent years through the Saubhagya scheme, and government data indicate that more than 99 per cent of households were connected to electricity in 2019.

Future of the Energy Sector

- Currently, solar energy is responsible for less than 4 per cent of India's total electricity output, whereas coal is responsible for close to 70 per cent.
- Solar power, along with other forms of generation technology and energy storage, is encouraged to be combined in order to provide a "round-the-clock" supply, which is one of the driving forces behind the growth of renewable energy projects on a utility scale.
- Between 2014 and 2019, there was approximately a 55 per cent increase in the amount of money invested in renewable energy.
- Wind and solar photovoltaic electricity currently account for 7 per cent of total output, which is twice as much as their proportion in 2014.

India to lead the Global Energy Sector

- Between 2019 and 2040, India will have the highest rise in energy demand of any country, accounting for about one-quarter of the total global increase.
- India, which is currently a major player in solar photovoltaics (PV), will take on a similar role in battery storage, attracting more than a third of global investment between 2019 and 2040.
- India's power system will grow larger than the European Union's by 2040, and it will be the world's third-largest in terms of electrical generation.
- By the year 2040, the solar PV module, wind turbine, lithium-ion battery, and water electrolyzer businesses in India are expected to generate a combined annual revenue of over $ 40 billion.
- With a total yearly trade volume of over $ 3 billion, India is now a net importer of goods such as solar photovoltaics (PV) and batteries.
- The solar photovoltaic (PV) cell and module production facilities in India have had difficulty operating with high capacity factors and competing with imports, notably those coming from China.
- The first plant in India to produce anodes for lithium-ion batteries was recently commissioned in the state of Karnataka.

7. Renewable Energy Transforming Rural Women

- Renewable energy is transforming the lives of rural women in India and has the potential to do much more.
- Several initiatives have been taken by MNRE, to bring out policies that leverage RE as a change-maker in rural women's lives.

Renewable Energy and Employment

- A Council on Energy, Environment and Water (CEEW) analysis estimates that India's targets of 1,00,000 MW of solar and 60,000 MW of wind power capacity will generate about 1.3 million direct jobs.
- Realising this massive opportunity, the National Institute of Solar Energy (NISE), an autonomous institute of MNRE, has organised the 'Surya Mitra' skill development programme in collaboration with State Nodal Agencies.
- Reliable energy access also affords women extra time that they can utilise in skill training sessions to get a job or start their own business.
- A women-led initiative, Hariyali Green, was implemented by the Association of Renewable Energy Agencies of States (AREAS) under MNRE (AREAS-MNRE) along with the Natural Resources Defense Council (NRDC) and the Self-Employed Women's Association (SEWA).
- It aimed to enhance access to clean energy technologies and improve livelihood opportunities at the household level in rural India. Their goal is to create 100 Green Villages by 2025.

Distributed Renewable Energy (DRE) Spurring Rural Women's Micro-Entrepreneurship

- In India alone, CEEW estimates a market upwards of USD 53 billion for using clean energy for productive enterprises in rural areas such as cold storage, looms, rice mills, and sewing machines.
- Each solar cold storage could augment the incomes for 50-100 farmers.
- Each agro-processing unit could help a group of farmers, or as in India, farmer producer organisations (FPOs).
- In February 2022, MNRE released a draft policy framework for promoting DRE livelihood applications with an explicit gender emphasis.
- The policy supports the adoption of DRE livelihood technologies among women by providing access to finance for entrepreneurs and end users. This will support the women SHG members in creating new jobs and scaling their existing businesses using DRE technologies.

Resilient Rural Health Systems for Women

- According to CEEW's 2017 analysis, 4.6 per cent of functional Primary Health Centres (PHCs) in India are unelectrified.
- A 2021 study states that lack of reliable electricity in healthcare centres is associated with a decrease of 64 per cent in child deliveries affecting women's access to safe healthcare.

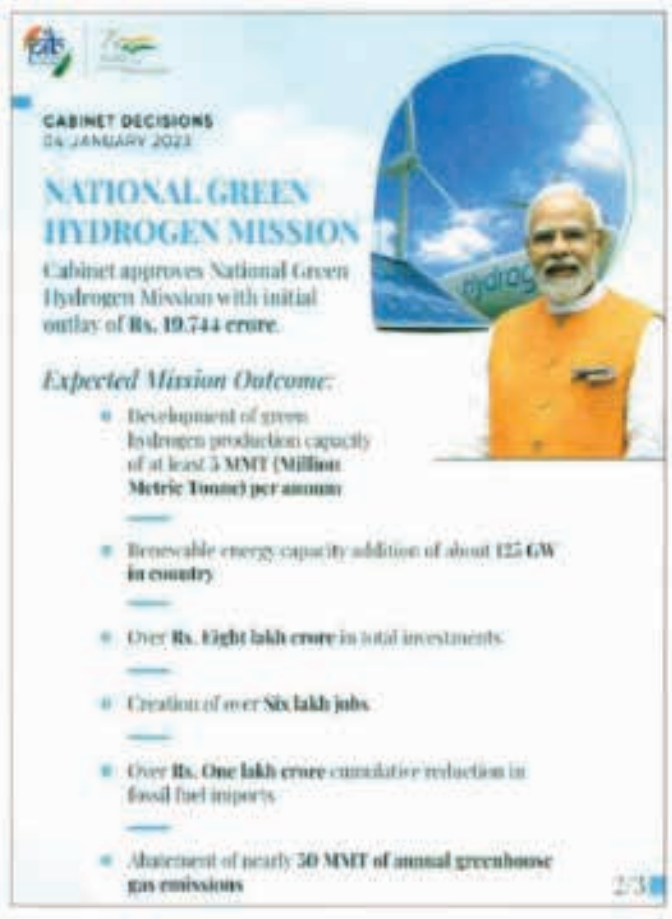
Access to Clean Energy Equals Access to Better Education and Health

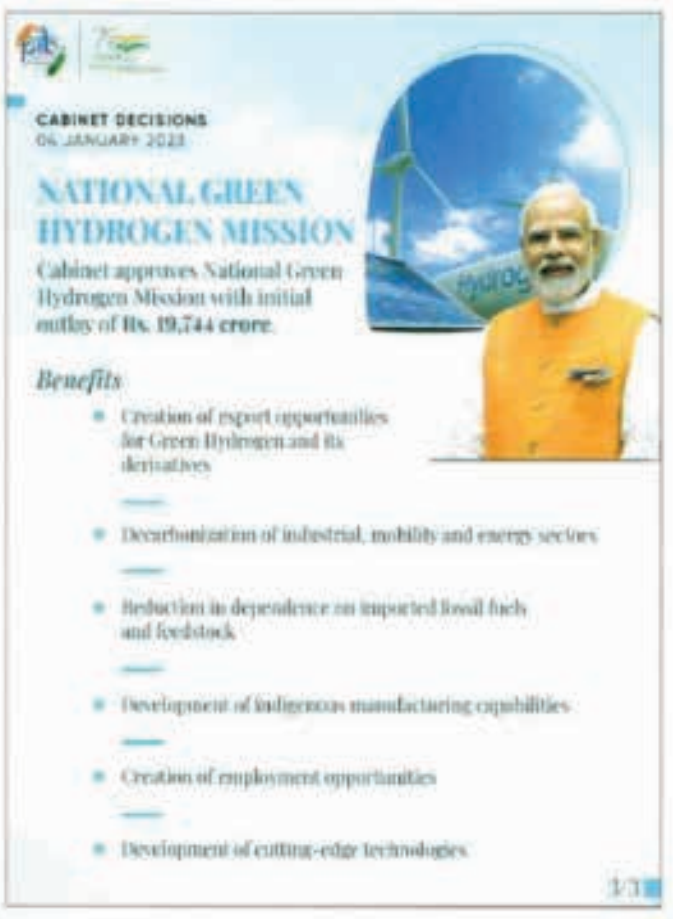
- The World Health Organisation (WHO) reports that 500,000 deaths occur yearly due to unclean cooking fuels in India.
- The International Energy Agency (IEA) estimated that the average firewood load carried by women for several miles daily varies from 25-50 kg.
- Providing clean energy access can reduce the drudgery among rural women, giving them time for education or skill upgradation and improving their health.

8. India: A Green Hydrogen Global Hub

- The Union Cabinet on 4th January 2023 approved the National Green Hydrogen Mission with an initial outlay for the mission is Rs.19,744 crore.
- The mission seeks to promote development of green hydrogen production capacity of at least 5 MMT (Million Metric Tonnes) per annum with an associated renewable energy capacity addition of about 125 GW in the country by 2030.
- Indian Oil Corporation aims to replace at least a tenth of its current fossil-fuel-based hydrogen at its refineries with carbon-free green hydrogen.
- In the long run, it envisages an investment of over Rs. 8 lakh crore and creation of over 6 lakh jobs by 2030.
- The Ministry of New and Renewable Energy (MNRE) will formulate the scheme guidelines for implementation.

- The Mission will also help India export high-value green products making it one of the first major economies to industrialise without the need to 'carbonise'.
- In 2020, India's hydrogen demand stood at 6 million tonnes (MT) per year and it is estimated that by 2030, the hydrogen costs will be down by 50 per cent. The demand for hydrogen is expected to see a five-fold jump to 28 MT by 2050 where 80 per cent of the demand is expected to be green in nature.
- Top industry leaders such as Reliance Industries Limited (RIL), Gas Authority of India Limited (GAIL), National Thermal Power Corporation (NTPC), Indian Oil Corporation (IOC) and Larsen and Toubro (L&T) plan to foray into the green hydrogen space.
- RIL plans to become a net-carbon zero firm by 2035 and invest nearly INR 750 billion over the next three years in RE.
- Indian Oil is at the forefront of the green hydrogen revolution. It is planning to set up India's first green hydrogen unit for the Mathura refinery, which will be used to process crude oil.
- Indian Oil Corporation aims to replace at least a tenth of its current fossil-fuel-based hydrogen at its refineries with carbon-free green hydrogen.
- India has declared its ambition to become an exporter of hydrogen to Japan, South Korea, and Europe.
- Various hydrogen powered vehicles have been developed and demonstrated under projects supported by the Government of India.
- Government policy in India is also extremely supportive of new investments in the hydrogen ecosystem and recently Indian enterprises can satisfy their renewable purchase obligations (RPOs) by purchasing green hydrogen.
- In India, the production cost of green hydrogen is around Rs. 500 per kg. The government expects to reduce the cost of manufacturing green hydrogen by 40-50 per cent through its policy initiatives.
- The Asia-Pacific region is the fastest growing area in the green hydrogen market. India has set a target of an annual production capacity of 25 million tonnes by 2047. The number could well be revised upwards as the technology evolves and the demand outlook improves.
- India today is in the process of finalising a roadmap for becoming a green hydrogen economy which would require Rs. 15 trillion and another Rs. 15 trillion to meet the middle-term goal by 2030. So, in all, these initiatives would require an investment of Rs. 30 trillion by 2030.





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