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Swarved Mahamandir - world's largest meditation centre

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Life through geometry in Warli.

Archaeological Survey of India (ASI) assures to send note to UNESCO over inclusion of Srimukhalingam temple in Andhra Pradesh in world heritage structures' list.

Where fossils meet faith in a Madhya Pradesh district.

ECONOMY

RBI, Bank of England sign MoU for cooperation in CCIL issue

India"s manufacturing PMI rises to 56.0 in November

4 poachers, 2 timber smugglers arrested in Similipal Tiger Reserve(STR).

Black-necked Grebe sighted at Hokersar wetland for the first time.

Eurasian otter discovered for the first time from Kerala.

Yogi calls for archaeological excavation in Sohagibarwa Wildlife Sanctuary.

Thousands of sardine fish surface near Goa beach, experts call it 'rare' event.

Royal Bengal Tigers spotted at 10,509 feet in Neora Valley National Park, confirming unique habitat.

National Transit Pass System (NTPS)-'One Nation-One Pass' to facilitate the seamless transit of timber, bamboo, and other forest produce across the country.

T.N. Forest Department to investigate private helicopter's unauthorised flyby over Mukurthi National Park.

Geography

Meghalaya"s Lakadong turmeric gets Geographical Indication tag

Indonesia"s Marapi Volcano Erupts, Blankets Nearby Villages With Ash

Paleoseismic investigations through earthquake induced liquefaction features can trace earthquake history & prepare for future

Indonesia"s Ibu volcano erupts

Fight for Ghaggar"s rights: Residents

US F-16 crashes into Yellow Sea off South Korea, says Yonhap report

India's extreme Rainfall Corridor

'Mission Antarctica'

Almora Fault

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Bab al-Mandab Strait

Illegal sand mining: 20 arrested, 40 big boats seized in Bihar police operation on Sone River.

Chandra River in Lahaul and Spiti district

Militants turn Pir Panjal Valley into new battleground.

Miscellaneous

US military aircraft wreckage found, five crew members confirmed deceased

Book Fair opens at the National Archives of India

Indian School Certificate Examinations (CISCE) has cancelled the compartment tests for the Class 12 board exams 2024.

Indira Gandhi Prize for Peace

Dr. Srinivas Naik Dharavath Honored with Visionary Leader Icon Award 2023 by AASRAA

Codex Alimentarius Commission Praises India's Standards on Millets

NCOIS wave rider buoy washes ashore in Gopalpur

Depression, constipation, and urinary tract infections may precede MS diagnosis

CDC probes cluster of ocular syphilis cases

IOA forms 3-member ad hoc committee to run affairs of suspended WFI.

Gwalior, the creative city of music, celebrates a new Guinness record.

Vaishali and Praggnanandhaa, first brother-sister duo to become Grandmasters: What is the chess title?

History

The Prime Minister of India will participate in the Veer Bal Diwas function at Bharat Mandapam.

International Relations

India re-elected to International Maritime Organisation Council with highest tally

At COP28, donors join IFC to lure $11 bln in climate cash

Pentagon claims USS Carney, multiple commercial ships attacked in Red Sea

Kamboj chairs briefing ahead of 62nd UN Commission for Social Development

International Social Security Association's ISSA Vision Zero 2023 Award

[Foreign Secretary Vinay Kwatra, UN Under Secretary General discuss India"s presidency of Conference on Disarmament]

[Donald Tusk elected as Prime Minister of Poland]

[Global Status Report on Road Safety]

[ENACT Partnership]

[European Free Trade Association (EFTA)]

[UNIDROIT]

[Tax Inspectors Without Borders (TIWB)]

[Houthis]

[Unesco recognises Kempegowda T2 as one of "world"s most beautiful airports"]

[India Hands Over $ 2.5 Million to UNRWA For Palestinian Refugees.]

Political Science

[5-J SC Bench To Review Ruling On 'Automatic Vacation Of Stay']

[Rakesh Asthana, 6 others appointed NHRC special monitors]

[S. 34 IPC | Common Intention Doesn"t Mean Prior Agreement, It Can Be Formed Even A Minute Before The Incident: Supreme Court]

[Panchayati Raj ministry launches Gram Manchitra app]

[SC affirms "Group of Companies' doctrine in Indian arbitration jurisprudence]

[Declaration of State emergency under Article 356 and subsequent actions of President should have reasonable nexus: SC]

[Revised versions of Crminal Bills]

[Breached the Lok Sabha chamber]

[Telangana"s Development Revolution: Key Points from Governor Tamilisai Soundararajan"s Strategic Plan]

[SUVAS and SUPACE]

[Suspension of 78 Opposition MPs]

[LS Passes Bills to Replace British-Era Criminal Laws]

[Supreme Court rules that tribunals cannot direct government to frame policy.]

[Parliamentary panel recommends FAME-II scheme's extension by at least 3 more years]

[On the occasion of Good Governance Day, Union Minister Dr Jitendra Singh launches the Extended Version of Mission Karmayogi.]

[Kerala state government urged the Centre to speed up measures for building a new dam at a meeting with the Central Water Commission(CWC).]

[Justice Sanjiv Khanna appointed National Legal Services Authority Executive Chairperson.]

[PM Garib Kalyan Anna Yojana: Cabinet extends free foodgrain scheme for five years]

[Dharmendra urges Naveen to implement PM-USHA in state]

[Odisha invokes ESMA to ban strikes by Health Department staff]

[Youth for Unnati and Vikas with AI (YUVAi) to be featured in GPAI Summit 2023]

[21.15 lakh applications received under PM Vishwakarma Scheme, says Skill Ministry]

[Indian Parliament Approves Sammakka Sarakka Central Tribal University]

[Rail Kaushal Vikas Yojana (RKVY)]

[Viksit Bharat Sankalp Yatra]

[Bharat New Car Assessment Programme (Bharat NCAP)]

[Logistics Ease Across Different States (LEADS) perception survey]

[BISAG-N]

[Sahitya Akademi Awards for 2023]

[Public Accounts Committee (PAC) Report on Agriculture Insurance Schemes]

[Pradhan Mantri Bhartiya Janaushadhi Pariyojana]

[PM-AJAY For Upliftment of SC Community]

[Project PRAYAS: UN program to help Indian youth migrate abroad.]

[Government aims to set up 17,000 creches across the country.]

[Union Minister of Health and Family Welfare launched the MedTech Mitra portal.]

[MEA's Flagship 'Know India Programme' for youth diaspora completes 20 years.]

[Govt raises Sukanya Samridhi Yojana interest rate.]

Science and Technology

[HIV/AIDS]

[Jellyfish with 240 tentacles discovered off Japan`s coast declared a new species]

[Indian Railways launches Gajraj Suraksha, a new AI-based tech to curb elephant-train collisions]

[Sugarcane byproduct pressmud can be a sweet spot for India"s compressed biogas sector]

[Amazon taps SpaceX"s Falcon 9 rocket to help launch Kuiper satellites]

[Study finds complex link between lipids and cholelithiasis]

[Six Alien Planets in Coordinated Cosmic Ballet Discovered]

[Piezoelectricity: Why quartz ticks]

[Anthrobots: Human Cell-Derived Tiny Robots Leave Scientists Surprised]

[Move over VoLTE, it's Vo5G time: How it works and when's India getting it]

[Human behaviour may be determined by fast changes in dopamine levels]

[World"s first portable hospital "Aarogya Maitri Aid Cube" unveiled in Gurugram]

[Golden Mole Presumed Extinct Found Again in South Africa]

[New FjordPhantom Android Malware Targets Banking Apps in Southeast Asia]

[Odia scientist discovers disease resistant wild okra]

[New fluorescent material detects anti-cancer drug overdose in minutes]

[Is White Lung Syndrome caused by a new pathogen]**?**

[How does GPS work?]

[Being Nidhi's parents: A 24-year journey of joy and struggles with India's 'first' Pompe disease patient]

[Solar Orbiter snaps clearest picture of Sun. Zoom in for a surprise]

[New young and highly scattered pulsar discovered with ASKAP]

[Pantoea Tagorei: Visva-Bharati researchers name a bacteria after Rabindranth Tagore that helps plants.]

[Researchers Sequence Genome of Giant Symbiotic Bacterium]

[Milli-second burst detected by AstroSat in new high magnetic field neutron star can help understand such stellar entities.]

[New 'zombie deer disease' alert for humans! Scientists sound alarm as virus spreads in US.]

[Ionospheric secrets traced in the White continent can help satellite-based navigation.]

[How Japan's moon-landing attempt in January will affect Chandrayaan 4.]

[New non-invasive formaldehyde sensor can detect adulterated fish at room temperature.]

[Researchers develop 'electronic soil' to enhance crop growth.]

[New Android 'Chameleon' trojan malware bypasses biometrics and steals PINs.]

[New therapy for Parkinson's Disease proposed.]

Security

[INS Kadmatt conducts underway replenishment with Japan"s JS Towada in North Pacific]

[Navy gets ready for its biggest naval exercise amid ocean engagements]

[CRPF deployed at Nagarjunasagar Dam amid Andhra Pradesh and Telangana fight]

[Defence Acquisition Council approves capital acquisition proposals worth Rs 2.23 lakh crore to enhance the operational capabilities of the Armed Forces]

[INS Sandhayak: GRSE delivers largest survey vessel built in India on Navy Day]

[Army Deploys Double Humped Camels In Eastern Ladakh]

[Pilatus PC-7 Mk II crash: 5 things to know about the trainer aircraft]

[664 crimes against women per million: NCRB data]

[MeitY organises 40th CISO Deep Dive Training Programme]

[National Automated Fingerprint Identification System Established at 1022 Locations, Says Home Ministry]

Anti-collision system Kavach deployed on 1465 Route km, 139 locomotives, work underway in major corridors

Union Raksha Rajya Mantri informed Lok Sabha that 16 defence technologies have been successfully developed/realised under the Technology Development Fund (TDF) scheme.

Missile testing paused in Odisha to save sea turtles

Indian Armed Forces contingent comprising 45 personnel reached Hanoi, Vietnam to take part in the Joint Military Exercise VINBAX-2023.

Karrar combat drones

Autonomous Flying Wing Technology Demonstrator

DRDO Achieves Milestone: Key Points on India"s Successful Flight Test of High-Speed Flying-Wing UAV

BEL Secures Rs.4,522 Crore Order from Indian Army

Vijay Diwas 2023: Commemorating India"s Victory in the 1971 War

India Deploys Counter UAV Systems At Military Installations Fearing Suicide Drone Attack

India receives two "Romeo" helicopters

INDIAN OCEAN NAVAL SYMPOSIUM (IONS) – 2023

Iran threatens to shut Strait of Gibraltar as tensions ramp up.

Navy's IFC-IOR played key role in the backend in tackling vessel hijacking.

2000-year-old Copper Coins Discovered At Ancient Site Of Mohenjo Daro

Archaeologists in Pakistan have discovered a remarkably unusual cache of 2000-year-old coins within the remains of a Buddhist shrine, constructed at the historic site of Mohenjo Daro (Pakistan). The copper coins that were discovered are thought to date back to the Kushan Empire.

Mohenjo Daro:

- Mohenjo Daro, or "**Mound of the Dead**" is an **ancient Indus Valley Civilization city**that **flourished between 2600 and 1900 BCE.**
- It lies **in Pakistan"s** Sindh province, on the **bank of the Indus River.**
- It was **discovered in 1922 by R. D. Banerji**, an **officer of the Archaeological Survey of India.**
- At about 3 mi (5 km) in circuit, it was the **largest city of the Indus civilization**, and it probably served as the **capital of an extensive state**.
- It was built around the **same time as the Great Pyramids of Egypt**.
- The ruins were **designated a UNESCO World Heritage Site** in 1980.
- Laid out in a **rectilinear grid and built out of baked bricks**, the city featured a complex water management system,complete with a **sophisticated drainage** and **covered sewer system**, and **baths in** nearly **every house.**
- The city included a **900-square-foot Great Bath** and about **700 wells.** The **Great Bath is a rectangular public pool**situated **in the citadel**. These were part of a water system that enabled homes to have their own baths and toilets.
- Mohenjo-Daro, like its contemporaries (Kalibangan and Harappa), was also **divided into two parts: the citadel and the lower town**.
- **Citadel**:
  - The **western mound,** or Citadel was **built on a raised platform** of mud brick and consisted of all the **important administrative structures like The Great Bath**, **granaries,** and the **College of Priests**.
  - It was **fortified by a thick mud-brick retaining wall.**
- **Lower Town:**
  - The **eastern** or **low-lying part** of the town was **also fortified** and was meant for the **settlement of commoners**.
  - Numerous **streets and small alleys ran across** this part of the city.
  - Within this section, **many sub-partswere built according to the guild systems**.
  - As people settled here, a **large number of artifacts** and information **regarding the burial practices** were found in this area.
  - **Multi-storey buildings:**
    - **The people** of Mohenjo-Daro **lived in houses that had similar features** throughout the town.
    - They consisted of a **central courtyard surrounded by rooms**.
    - Almost **every household had individual toilets and bathrooms**.
    - The **doors and windows** always **opened in the alleys.**
    - The **concentration of wealth** in the hands of a few **can be seen through the dimensions of their houses**. For instance,

the **commoners lived in single-storey houses** while the **rich lived in double or** sometimes **treble-storey houses.**

Karnataka HC asks authorities to remove encroachments of Bahmani Sultans'' fort in Kalaburagi

The Karnataka High Court directed the Kalaburagi district authorities to remove encroachments from the historical fort of Bahmani Sultans in the city.

- The Bahmani Sultanate, **also known as the Bahmanid Empire, was a significant medieval Muslim state in the Deccan region of South India**.
- It was **established by Ala-ud-Din Hasan Bahman Shah in 1347 and lasted until 1527 when it fragmented into five smaller states.**

Foundation and Expansion

- **Establishment by Hasan Bahman Shah**: The Bahmani Sultanate was founded by Hasan Bahman Shah, a governor appointed by the Delhi Sultanate. He declared independence and established his capital at Gulbarga.
- **Territorial Expansion**: Under subsequent rulers, especially during the reigns of Muhammad Shah I and Firuz Shah, the Bahmani Sultanate expanded its territories across the Deccan region, encompassing areas such as Gulbarga, Bidar, Bijapur, and Golconda (modern-day Hyderabad).

Administration and Governance

- **Feudal System**: The Sultanate was administratively divided into four provinces (Daulatabad, Bidar, Berar, and Gulbarga) with tarafdars or subedars governing each. The sultanate was governed through a decentralized feudal system. Provinces were ruled by governors known as walis or nayaks, who held considerable power in their respective regions.
- **Central Administration**: The sultanate had a centralized administrative structure with key departments handling revenue, justice, and military affairs.

Cultural and Socio-Economic Development

- **Patronage of Arts and Culture**: The Bahmani rulers were patrons of art, literature, and architecture. They encouraged the development of Deccani culture, which was a blend of Persian and Indian influences. Notable structures include Gulbarga''s Jama Masjid, Bidar''s Rangeen Mahal, and Bijapur''s Gol Gumbaz. Urdu, Persian, and Arabic literature flourished during this period.
- **Promotion of Regional Languages**: The Bahmani court supported the use of local languages like Dakhni (early form of Urdu) and Kannada, contributing to their literary growth.
- **Economic Prosperity**: Trade and commerce flourished in the Bahmani Sultanate due to its strategic location. The region was a center for international trade, particularly in horses, textiles, and spices.

Religious Policies

- **Religious Tolerance**: The sultans followed a policy of religious tolerance, allowing diverse religious communities like Hindus, Muslims, Jains, and Christians to coexist peacefully.
- **Promotion of Syncretic Culture**: The sultanate''s cultural milieu was marked by the syncretic blending of different religious traditions and practices.

Decline and Fragmentation

- **Internal Strife and Dynastic Conflicts**: As the Bahmani Sultanate expanded, internal conflicts and power struggles among the nobility weakened its unity.
- **Rise of Five Successor States**: In 1527, the sultanate disintegrated into five smaller states known as the Deccan Sultanates: Ahmadnagar, Bijapur, Golconda, Berar, and Bidar, each ruled by independent rulers.

Rulers

Founding Ruler:

- **Ala-ud-Din Hasan Bahman Shah (1347-1358)**:
- Founder of the Bahmani Sultanate after declaring independence from the Delhi Sultanate.
- Established Gulbarga as the capital and began the Sultanate"s expansion in the Deccan region.

Early Rulers:

- **Muhammad Shah I (1358-1375)**:
- Consolidated power and expanded Bahmani territories.
- Shifted the capital to Bidar.
- Promoted art, literature, and culture.
- **Firuz Shah (1397-1422)**:
- Extended Bahmani rule further into the Deccan and introduced administrative reforms.
- Encouraged trade and commerce, contributing to economic prosperity.

Golden Age Rulers:

- **Ahmad Shah I (1422-1436)**:
- Notable for his patronage of art and culture, fostering a thriving cultural scene.
- Facilitated the development of the Dakhni language (early form of Urdu).
- **Alauddin Ahmad Shah II (1436-1458)**:
- Continued the cultural and literary advancements initiated by his predecessors.
- Faced internal revolts and external threats during his reign.
- **Mahmud Gawan (1466 to 1481):**
- Sultanate witnessed its zenith.
- Gawan"s military campaigns expanded the Sultanate"s territory, including the reconquest of Goa from Vijayanagar.

Later Rulers:

- **Mahmud Shah I (1482-1518)**:

- Ruled during a period of internal turmoil and external invasions.
- Struggled to maintain unity among the nobility, leading to the weakening of the Sultanate.
- **Kalim Allah (1518-1527)**:
- Last ruler of the unified Bahmani Sultanate.
- His reign witnessed escalating conflicts and a fragmented administration.

Fragmentation and Successor States:

- Krishnadeva Raya of the Vijayanagar Empire''s military campaigns fractured the Bahmani Sultanate into five smaller states known as the Deccan Sultanates:
- **Ahmadnagar Sultanate**: Founded by Ahmad Nizam Shah I.
- **Bijapur Sultanate**: Established by Yusuf Adil Shah.
- **Golconda Sultanate**: Founded by Quli Qutb Shah.
- **Berar Sultanate**: Ruled by Fathullah Imad-ul-Mulk.
- **Bidar Sultanate**: Established by Amir Barid.
- Each of these successor states operated independently, contributing to the cultural, artistic, and political landscape of the Deccan region.
- **Battle of Talikota (1565)**: The conflict between the Deccan Sultanates and the Vijayanagar Empire culminated in the catastrophic Battle of Talikota, resulting in Vijayanagar''s downfall.
- **Mughal Annexation**: Subsequently, the Mughal Empire, notably under Akbar and later Aurangzeb, annexed the Deccan Sultanates into their dominion, marking the end of the Bahmani legacy.
- The Bahmani Sultanate, despite its fragmentation, left a lasting legacy in South India, influencing the region''s culture, architecture, and language, and shaping the course of history in the Deccan

The Bahmani Sultanate played a transformative role in South India''s history, establishing Islamic rule, contributing to the region''s cultural richness through architecture and literature, and shaping the political landscape. Its rise, conflicts with Vijayanagar, internal strife, and ultimate fragmentation into the Deccan Sultanates remain pivotal episodes in India''s historical tapestry, illustrating the complex interplay of power, culture, and regional dynamics during medieval times.

Rajasthan International Folk Festival

Rajasthan International Folk Festival, artists performed the Kalbeliya dance.

Kalbeliya Dance

- It is a folk dance from Rajasthan.
- It is well known by other names like **"Sapera Dance" or "Snake Charmer Dance".**

- It is particularly performed by a Rajasthani tribe called "Kalbelia".
- This dance has become so well-known throughout the world that this dance and its songs have been included in UNESCO"s representative list of the Intangible Cultural Heritage of Humanity since 2010.
- In Kalbelia dance, males play various traditional instruments and females perform the dance.
- It is one of the most sensuous dances among all Rajasthani dances.
- In this dance form, the main performers are female dancers who dance and swirl, replicating the movements of a serpent.
- The dancers wear brightly coloured skirts, blouses, and heavy jewellery.
- **Instruments:** The male musicians typically play the dhol (a drum), the pungi (a snake charmer's pipe), and the khanjari (a tambourine).

TN CM to unveil statue of Iyothee Thass Pandithar on December 1
Iyothee Thass Pandithar:

- He was born on 20 May 1845 in Madras presidency.
- He was a prominent **anti-caste activist and a practitioner of Siddha medicine.**
- **Association with tribal people:** In the 1870s, Iyothee Thass organised the Todas and other tribes of the Nilgiri Hills into a formidable force for the freedom movement.
- In 1876, Thass established the **Advaidananda Sabha** and launched a magazine called **Dravida Pandian** in collaboration **with Rev. John Rathina.**
- He established the "**Dravida Mahajana Sabha** "" in 1891 along with **Rettamalai Srinivasan.**
- He established the **Sakya Buddhist Society in Madras,** with branches all over South India.
    - The Sakya Buddhist Society, also known as **the Indian Buddhist Association,** was established in 1898.
    - To manage and coordinate the functioning of society, he began a weekly **magazine, Tamizhan, in 1907**

Gujarat"s 'Garba' dance makes to UNESCO Intangible Cultural Heritage List
Garba Dance

- It is a **ritualistic and devotional dance** performed throughout the **State of Gujarat**.
- It is celebrated for nine days **during the festival of Navratri.**
- The festival is dedicated to the **worship of the feminine energy or Shakti.**
- The cultural, performative, and visual expressions of this feminine energy are expressed through the Garba dance.

- The performative and visual celebration of Garba takes place within homes and temple courtyards, public spaces in villages, urban squares, streets, and large open grounds. Garba thus becomes an all-encompassing participatory community event.
- In addition to being a **religious ritual, Garba fosters social equality** by diluting socio-economic, gender, and rigid sect structures.
- It continues to be inclusive and participative by diverse and marginalised communities, strengthening community bonds.
- This dance form is **the 15th cultural item from India** to make it to the **UNESCO list.**

Intangible Cultural Heritage

- Cultural heritage does not end at monuments and collections of objects.
- But also includes **traditions or living expressions inherited from our ancestors** and passed on to our descendants, such as oral traditions, performing arts, social practices, rituals, festive events, knowledge and practices concerning nature and the universe or the knowledge and skills to produce traditional crafts.

Hatti community announces protest on December 16 to press for implementation of ST status law

Hatti community:

- The Hattis are a close-knit community who take their name from their traditional occupation of selling home-grown crops, vegetables, meat, and wool at small-town markets known as**'haats'.**
- Hatti men traditionally don a distinctive white headgear on ceremonial occasions.
- The Hatti homeland straddles the **Himachal-Uttarakhand border** in the basin of the **Giri and Tons rivers**, both tributaries of the Yamuna.
- The Tons marks the border between the two states, and the Hattis living in the Trans-Giri area in today's Himachal Pradesh and Jaunsar Bawar in Uttarakhand were once part of the royal estate of **Sirmaur**. Jaunsar Bawar was conquered by the British in 1814.
- **The two Hatti clans**, in Trans-Giri and Jaunsar Bawar, have similar traditions, and inter-marriages are common.
- They are governed by a traditional council called **'khumbli'** which decides community matters.
- According to the 2011 census, members of the community numbered 2.5 lakh but at present population of the Hattis are estimated at around 3 lakhs.

Meat, alcohol prohibited around Pashupatinath Temple for a week on occasion of Bala Chaturdashi festival

Pashupatinath Temple

- It is a Hindu temple dedicated to Pashupati, a form of Shiva.
- **Location:** It is located on the bank of the **Bagmati River** on the eastern outskirts of **Kathmandu, Nepal.**
- In 1979, the temple was declared **a UNESCO World Heritage Site.**
- **Features:**
    - The temple complex includes 518 temples, buildings, and structures.
    - The main temple is designed in the **Nepalese pagoda style,** with a tiered roof and plinth.
    - It is a two-tiered structure with **a gold-plated roof.**
    - The temple has two interior rooms where the Pashupatinath idol is placed.
    - It is a cubic structure with four main doors, all covered with silver sheets.
    - One of the most astonishing decorations of the temple is the huge **golden statue of Nandi,** Shiva's bull.

Pagoda

- A Pagoda is a **tower like, multistorey, solid or hollow structure** made of stone, brick, or wood, usually associated with a Buddhist temple complex, common in China, Japan, Korea, Nepal, Vietnam, and other parts of Asia.
- The pagoda structure derives from that of the **stupa,** a hemispherical, domed, commemorative monument first constructed in ancient India.
- Pagodas are constructed around a central staircase and can have many forms.
- A pagoda has three sections: a base, a body, and a top, which often takes the form of a miniature pagoda.

Madhya Pradesh: 10,000-year-old rock painting found in Satpura Tiger Reserve

During the counting of wild animals in the Satpura Tiger Reserve, the forest officials discovered a rock painting dating back 10,000 years.

Satpura Tiger Reserve (STR):

- **Location:**
    - It is located in the **Narmadapuram district** of Madhya Pradesh.
    - It is located in the Satpura ranges of the Central Indian Landscape.
    - It lies south of the river Narmada.
- **Satpura,** basically meaning "**Seven Folds",** forms a watershed between the **Narmada and Tapti Rivers** and is triangular in shape.

- It is part of the Deccan bio-geographic zone of India.
- It is part of the **Pachmarhi Biosphere Reserve.**
- STR is part of one of the largest tiger habitats in the world, extending over 10,000 sq. km along with the forest areas of Betul, Harda, Khandwa, and Melghat forest divisions.
- **Corridor:** It has corridor connectivity with Pench National Park.
- The habitat is also an important testimony to human evolution, as it houses more than **50 rock shelters** that are almost 1500 to 10,000 years old.
- Geological formations include the **Deccan trap series, Gondwanas, and Metamorphic rocks.**
- **Flora:**
  - This reserve is largely made up of mixed forests with a sizable proportion of **Sal and Teak.**
  - These mixed forests consist of tree species like jamun, baheda, palash, mahua, saja, bija, tendu, arjun, semal, salai, kusum, achar, etc.
  - Twenty-six species of the Himalayan region and 42 species of the Nilgiri area are found. Hence, STR is also known as the **northern extremity of the Western Ghats.**
- **Fauna:** Tigers, leopards, spotted deer, sambar, barking deer, chousingha, Indian gaur, blue bull, and jungle cats, along with co-predators, birds, reptiles, and fish, are also found.

Deadline for Submission of Applications for "Adopt a Heritage 2.0" Program

Adopt a Heritage 2.0 Program

- It is a revamped version of the earlier scheme launched in 2017 and clearly defines the amenities sought for different monuments as per **the Ancient Monuments and Archaeological Sites and Remains Act (or AMASR Act), 1958.**
- The programme seeks collaboration with the private/public sector companies / trusts / societies / NGOs etc. through their CSR funding who intend to provide, develop, and maintain 'amenities' at centrally protected monuments and sites.

Adopt a Heritage Scheme

- It is an initiative of the **Ministry of Tourism,** in collaboration with the **Ministry of Culture and the Archaeological Survey of India.**
- It was launched in September 2017 on the World Tourism Day.
- Under it, the government invites entities, including public sector companies, private sector firms, as well as individuals, to develop selected monuments and heritage and tourist sites across India.

- The project aims to encourage these entities to become **'Monument Mitras'** and take up the responsibility of developing and upgrading the basic and advanced tourist amenities at these sites.
- The corporate sector is expected to use **corporate social responsibility (CSR) funds** for the upkeep of the site.
- The Monument Mitras, in turn, will get limited visibility on the site premises and on the Incredible India website.

Koya tribe rides the eco-friendly wave to help conserve the Indian Bison of Eastern Ghats

Koya Tribe

- Koya are one of the few multi-racial and multi-lingual tribal communities in India.
- They live in the forests, plains, and valleys on both sides of the Godavari River, which lies in Andhra Pradesh.
- Many also live in the states of Madhya Pradesh and Orissa.
- They believe their main deity still resides in a cave in the **Bastar region.**
- **Language:**
  - Most Koya speak either Gondi or Telugu, in addition to Koyi.
  - Koyi is closely related to Gondi and has been strongly influenced by Telugu.
- **Occupation:** Traditionally they are pastoralists and shifting cultivators but now-a-days, they have taken to settled cultivation supplemented by animal husbandry and seasonal forest collections.
- They erect **menhirs** in memory of the dead.
- **Culture:**
  - The Koyas adopted Bison horns to discover their two cultural forms: the **Kommu Koya dance,** during which two Bison horns are adorned on the head as part of the attire, and the **Permakore flute**, which is made of a single horn.
  - They have retained their rich and varied heritage of colourful dance and music which form an integral part of their festivals and rituals.
  - Many Koya deities are female, the most important being the "**mother earth.**"

Temple linked to Hercules and Alexander the Great discovered in ancient megacity in Iraq

Girsu:

- Girsu was a city of the **Sumer civilization.**

- It was discovered during the 19th century, with the first excavations being conducted in the 1880s by the French archaeologist, **Ernest de Sarzec.**
- It was significant in that it first revealed to the world the existence of the Sumerian civilization, as well as bringing to light some of the most vital monuments of Mesopotamian art and architecture.
- **Key Facts about the Sumer Civilization:**
  - It is one of the earliest known civilizations that flourished between c. **4100-1750** BCE in the historical region of southern Mesopotamia, in present-day Iraq.
  - Sumer was never a cohesive political entity, however, but a region of **city-states,** each with its own king.
  - The Sumerians were responsible for many technological advancements, including measurements of time as well as writing.
  - They essentially "invented" time by dividing day and night into 12-hour periods, hours into 60 minutes, and minutes into 60 seconds.
  - They built the **first known cities** as well as creating the first known code of law. According to archaeological evidence, they built about a dozen city-states in the fourth millennium BC.
  - They advanced the craft of writing, literature, hymns and prayers. The **epic of Gilgamesh**, considered to be the world's oldest surviving piece of literature, derives from five Sumerian poems.
  - They also perfected several existing forms of technology, including the wheel, the plough, and mathematics.
  - They were also notably one of the first civilizations to brew beer, which was seen by the ancient people as a key to a healthy heart and liver.

Kashi Tamil Sangamam at Namo Ghat, Varanasi

- Prime Minister Narendra Modi inaugurated the Kashi Tamil Sangamam at Namo Ghat, Varanasi.
- First held last year, the Kashi Tamil Sangamam seeks to celebrate North and South India's historical and civilisational connections.
- The historical link between Kashi (Varanasi) and Tamil Nadu, often referred to as Tamilakam, spans centuries and is deeply rooted in cultural, religious, and historical contexts.

Historical and Mythological Ties

- **Parakrama Pandya's Legend**: According to legends, King Parakrama Pandya from the Madurai region in the 15th century traveled to Kashi to acquire a lingam for constructing a grand Shiva temple. However, during his return, the cow carrying the lingam halted at a place known today as Sivakasi.

Considering this divine intervention, Parakrama Pandya installed the lingam there, and the site is now known as Sivakasi.

- **Kasi Viswanathar Temple**: To enable devotees who couldn''t travel to Kashi, the Pandyas built the Kasi Viswanathar Temple in Tenkasi, southwestern Tamil Nadu, replicating the Kashi experience.
- **Adhivir Ram Pandyan**: In the 19th century, another king named Adhivir Ram Pandyan constructed a Shiva temple in Tenkasi after returning from a pilgrimage to Kashi, further solidifying the connection between these regions.

Cultural Exchange through Kashi Tamil Sangamam

- **Purpose**: The Kashi Tamil Sangamam is a platform that facilitates cultural exchanges between North and South India, showcasing art, music, handlooms, handicrafts, cuisines, and products from Tamil Nadu and Varanasi.
- **Participants**: Around 1,400 dignitaries from Tamil Nadu and Puducherry are participating in this year''s event, engaging in various cultural activities, exhibitions, and exchanges over a 15-day period. Different groups comprising students, teachers, professionals, spiritual leaders, artisans, writers, traders, and businessmen are scheduled to visit Varanasi during this event.

Significance in Education and Culture

- **Scholarly Connection**: In ancient times, a scholar''s education in Southern India was considered incomplete without a pilgrimage to Kashi. Kashi and Kanchi, both centers of knowledge, shared similar literary themes, reflecting a deep intellectual connection.
- **Pilgrimage Practices**: Pilgrims from Rameswaram would visit Kashi for darshan (divine viewing) and bring back water from the Ganges for rituals in Rameswaram, signifying the spiritual connection between the two sacred sites.
- **Shared Architectural Styles**: The presence of around 18 Shiva temples bearing the name "Kashi" in Chennai''s vicinity indicates architectural influences and the spread of cultural practices.

Contemporary Engagement and Discoveries

- **Reconnecting Traditions**: The Kashi Tamil Sangamam aims to revive and deepen cultural ties, fostering connections between traders dealing in silk saris from Banaras and Kanchipuram, while also exploring architectural, culinary, and various other cultural associations.
- **Exploration and Reconnection**: Educationist Chamu Krishna Shastry emphasizes the ongoing process of rediscovery and reconnection between Kashi and Tamil Nadu, highlighting the shared heritage and the significance of the name "Kashi" in Tamil culture.

The Kashi Tamil Sangamam serves as a vibrant platform to celebrate the shared heritage and historical connections between Kashi and Tamil Nadu, fostering a deeper understanding and appreciation of the rich cultural tapestry between North and South India.

Yogmaya Temple in Mehrauli

From a Mughal-sponsored structure to a concrete building, **the Yogmaya Temple in Mehrauli** is a historically important monument believed to be standing at the site of an

ancient temple that is said to have come up during the period of the Mahabharata but of which no trace exists anymore.

- The Yogmaya Temple**, also known as Jogmaya Temple or Jogmaya Mandir**, holds significant historical and religious importance in India.
- **Dedicated to the goddess Yogmaya**, believed to be the sister of Lord Krishna and an incarnation of Durga, the temple''s history is intertwined with ancient mythology and has witnessed phases of destruction and reconstruction by various rulers.

Historical Significance

- **Ancient Roots:** The temple''s origins are traced back to the Mahabharata era, believed to have been built by the Pandavas after the end of the epic war.
- **Historical Destruction:** The temple was among the 27 temples reportedly destroyed by Mamluk rulers. However, it stands as the sole surviving temple from the pre-sultanate period and is still actively used for worship.
- **Reconstruction:** Hindu king Samrat Vikramaditya Hemu is credited with restoring the temple after its destruction by Islamic rulers.

Architectural Description

- **Structural Evolution:** The present temple, reconstructed in the 19th century, is a contemporary structure comprising an entrance hall, a sanctum sanctorum housing the main idol of Yogmaya, and a dome and truncated shikara (tower).
- **Idol and Worship:** The main idol, made of black stone and adorned with sequins and cloth, represents Yogmaya. Devotees offer flowers and sweetmeats without the tolling of bells during worship.

Folklore and Cultural Events

- **Folk Legends:** The temple is associated with folklore related to Yogmaya''s incarnation as Krishna''s sister and her pivotal role in predicting Kansa''s demise.
- **Phool Walon Ki Sair Festival:** An integral part of an inter-faith festival in Delhi, the temple is central to this annual event where floral punkahs are offered to the deity.

Historical References and Affiliations

- **Mughal Connection:** Records suggest Emperor Akbar II''s association with the temple, with legends of his wife praying for her son''s safe return, invoking Yogmaya''s blessings.
- **Geographical Association:** The temple lies within the Lal Kot walls, part of the historic fortress citadel of Delhi, and holds a significant place near the Qutb Complex.

Continuing Tradition and Care

- **Community''s Role:** The local community, consisting of over 200 people tracing their ancestry to a common forefather, actively participate in temple maintenance and rituals, following age-old customs.
- **Cultural Expansion:** Similar temples dedicated to Yogmaya exist across India in places like Rajasthan, Vrindavan, Dehradun, among others.
- Jogmaya Temple, Barmer Rajasthan
- Jogmaya Temple, Multan
- Jogmaya Temple, Jodhpur, Rajasthan

- Yogmaya Temple, Vrindavan
- Yogmaya Temple, Naya Bans Khari Baoli, Old Delhi
- Yogmaya Temple, Dehradun, Uttarakhand
- Jogmaya Tripura Sundari Temple

The Yogmaya Temple in Mehrauli stands not only as a place of worship but also as a testament to Delhi''s syncretic heritage, reflecting architectural, religious, and cultural influences from different periods in history. Despite undergoing various reconstructions and facing periods of destruction, its resilience and continued significance in contemporary religious practices highlight its enduring legacy.

Swarved Mahamandir - world's largest meditation centre

Prime Minister Narendra Modi inaugurated the **Swarved Mahamandir, a magnificent seven-floor temple located in Varanasi''s Umaraha area which is the world's largest meditation centre.**

- The visit marked the centenary celebration of Vihangam Yoga and the establishment of Vihangam Yog Sansthan by Sadguru Sadafal Deoji Maharaj, a renowned 19th-century spiritual leader.

Architectural Marvels

- **Design:** The temple features an impressive design, including 125-petal lotus domes and can accommodate 20,000 individuals for meditation.
- **Location:** Situated in the Umaraha area, it covers an expansive area of 3,00,000 square feet, approximately 12 km from Varanasi''s city center.
- **Foundation and Construction:** Laid in 2004, the temple''s construction involved collaborative efforts from 600 workers and 15 engineers.

Distinctive Features

- **Intricate Details:** The temple boasts teakwood ceilings and doors adorned with intricate carvings, along with 101 fountains enhancing its aesthetic appeal.
- **Spiritual Emphasis:** Verses from the Swarveda, a spiritual text by Sadguru Shri Sadafal Deoji Maharaj, adorn the walls of the seven-floor superstructure.
- **Materials and Garden:** Pink sandstone embellishes the walls, and a medicinal herb garden adds to the temple''s beauty.

Spiritual Significance

- **Swarved Mahamandir:** Named after the Swarveda, the temple aims to promote the teachings of this spiritual text.
- **Purpose:** It aims to radiate a spiritual aura, spreading a state of peaceful awareness worldwide.
- **Teachings:** The temple advocates Brahm Vidya from the Swarveda, promoting spiritual wisdom and unwavering peace.
- **Teachings'' Focus:** Swarved Mahamandir focuses on propagating Brahm Vidya from the Swarveda, aiming to enlighten seekers spiritually.
- **Worldwide Influence:** The temple''s vision is to illuminate humanity and inspire a state of serene consciousness globally.

Meditation in India

Historical Significance:

- **Ancient Origins:** The practice of meditation finds its origins in ancient Indian scriptures like the Vedas, Upanishads, and the Bhagavad Gita, dating back thousands of years.
- **Vedic Period:** Early references to meditative practices were primarily linked to Vedic rituals, focused on mental concentration and spiritual contemplation.
- **Spiritual Heritage:** Meditation flourished within the teachings of great spiritual leaders like Buddha, Mahavira, Adi Shankaracharya, and others.

Meditation Traditions:

- **Yoga and Meditation:** Yoga, a comprehensive system that includes physical postures (asanas), breath control (pranayama), and meditation, originated in India. Patanjali''s Yoga Sutras, dating back to around 200 BCE, outline meditation practices as part of the eight-fold path to enlightenment.
- **Vipassana and Mindfulness:** The practice of Vipassana, popularized by Gautama Buddha, focuses on mindfulness and insight, observing sensations and thoughts to achieve self-awareness and liberation from suffering.
- **Jain Meditation:** Jainism emphasizes deep contemplation, focusing on self-realization, shedding karmic bondage, and achieving spiritual purity through meditation.
- **Transcendental Meditation (TM):** TM, introduced by Maharishi Mahesh Yogi in the mid-20th century, is a technique involving silent repetition of a mantra, aiming for inner peace and transcendence.

Influence on Culture and Society:

- **Religious Practices:** Meditation is integral to various religious practices in India, including Hinduism, Buddhism, Jainism, and Sikhism, forming a core aspect of spiritual rituals and daily routines.
- **Ashrams and Spiritual Centers:** Across India, numerous ashrams, monasteries, and spiritual centers serve as hubs for meditation retreats, teachings, and spiritual guidance.
- **Cultural Integration:** Meditation has transcended religious boundaries, becoming an integral part of India''s cultural fabric, influencing art, literature, music, and traditional healing practices.

The Swarved Mahamandir, inspired by the Swarveda, stands as a testament to spiritual enlightenment and peacefulness. With its architectural brilliance and focus on propagating profound spiritual teachings, it strives to illuminate humankind with a divine spiritual aura, emphasizing inner peace and spiritual wisdom.

Kolattam Dance

- In Vijayawada, Andhra Pradesh Girls performed Kolattam dance during Balotsav, a children's festival.
- The Kolattam dance is predominantly a dance **performed by women,**in Southern India.
    - Men mostly take up the role as drummers or play the background music.

- In **Tamil Nadu and Kerala**the dance is known as **Kummi** and in **Andhra Pradesh** it is known as
- The dance form resembles the **Dandiya and garba**folk dances of

Performance of Dance

- The group comprises dancers in the range of 8 to 40. It is **performed by using sticks**to represent the rhythm of the dance.
    - The sticks are stroked against each other in a calibrated form for creating harmony.
- The dancers are led by a leader and move about in **two circles.**The inner circle receive the strikes on their sticks from the artists in the outer circle that deliver them.

Archaeological Survey of India (ASI) assures to send note to UNESCO over inclusion of Srimukhalingam temple in Andhra Pradesh in world heritage structures' list.

- Srimukhalingam temple is located in the state of Andhra Pradesh.
- This temple is built in the Kalinga architectural style.
- It is located on the banks of Vamsadhara River and is dedicated to lord Srimukha Lingeswara (a form of Shiva).
- The Shivalinga here has a mukha or facial representation of Lord Shiva.
- It was constructed in the 9th century CE by kings of the Eastern Ganga Dynasty.
- It contains exquisite sculptures from that period.
- It is believed that visiting this temple and taking a dip in the river relieves one from the cycle of rebirth.
- It is housing 3 ancient temples at one Location.
- The Trinity of Madhukeshwara, Someswara and Bheemeswara Temples are a testimony to the magnificent architectural skills of Kalinga Kings.
- It was built by Kamarnava II, ruler from the family line of Eastern Ganga.

Key points about UNESCO World Heritage Sites

- A World Heritage Site (WHS) is a landmark or area with legal protection by an international convention administered by the UNESCO under the UNESCO World Heritage Convention, established in 1972.
- These sites are designated by UNESCO for having cultural, historical, scientificor other forms of significance.

- The sites, classified as cultural, natural and mixed(meeting both cultural and natural criteria) heritage around the world, are considered to be of outstanding value to humanity.
- To be selected, a WHS must be a somehow unique landmark which is geographically and historically identifiable and has special cultural or physical significance.
- For example, WHS might be ancient ruins or historical structures, buildings, cities, deserts, forests, islands, lakes, monuments, mountains or wilderness areas.
- These sites are demarcated by UNESCO as protected zones and the list is maintained by the international World Heritage Program administered by the UNESCO World Heritage Committee.

RBI, Bank of England sign MoU for cooperation in CCIL issue

Clearing Corporation of India Limited (CCIL)

- It was set up in April 2001 to **provide guaranteed clearing and settlement functions for transactions in money, G-Secs, foreign exchange, and derivativemarkets**.
- CCIL also provides **non-guaranteed settlement for Rupee interest rate derivatives and cross-currency transactions through** the **CLS Bank**.
- **Promoters**: **State Bank of India**, **IDBI Bank** Ltd, **ICICI** Bank Ltd, Life Insurance Corporation of India (**LIC**), **Bank of Baroda** and **HDFC** Bank Ltd.
- The company was incorporated with an authorised equity share capital of Rs. 50 crores.
- CCIL's adherence to the stringent principles governing its operations as a Financial Market Infrastructure (FMI) has resulted in its **recognition as a Qualified Central Counterparty (QCCP) by the Reserve Bank of India** in 2014.
- It has also **set up a Trade Repository** to enable financial institutions **to report**their **transactions in Over-the-Counter (OTC) derivatives.**
- Through **its fully owned subsidiary, Clearcorp Dealing Systems Limited (CDSL)**, CCIL has **introduced various platforms for the electronic execution of deals** in various market segments.
- Further, CDSL has **developed, implemented, and manages the NDS-OM**, the **RBI-owned anonymous electronic trading system for dealing in G-Secs** and **also for reporting OTC deals,** as well as the **NDS-CALL platform,** which **facilitates electronic dealing in the Call, Notice & Term Money market.**
- CCIL is **also the trade repository for all OTC transactions in** the **Forex**, I**nterest Rate and Credit derivative transactions.**

CLS

- **Continuous Linked Settlement** (CLS) is an **initiative by** a consortium of the **world's largest foreign exchange clearing banks to eliminate** the **settlement risk in foreign exchange transactions.**

- The CLS system is **run by CLS Bank International**, which is solely dedicated to settling foreign exchange trades.
- The CLS Bank was established in 2002 and is **owned by the world's largest banks**. It is **based in New York,** with its **main operations in London**.
- **Working**:
  - Standard foreign exchange transactions involve a settlement risk. As the **exchange of the two currencies involved is not simultaneous**, the **party that sells a currency** before receiving the currency purchased from the counterparty **is exposed to a certain risk.**
  - **CLS** removes settlement risk by **using a payment-versus-payment mechanism** ("PVP"). This means that **you get paid only if you pay**.
  - On settlement day, **each counterparty** to the trade **pays to CLS the currency it is selling.**
  - **CLS pays out the bought currency only if the sold currency is received**.
  - In effect, CLS **acts as a trusted third party** in the settlement process.
  - It's important to note that CLS is **not a central counterparty**; the **trade remains between the two counterparties.**

India''s manufacturing PMI rises to 56.0 in November

Purchasing Managers' Index

- It is an **indicator of business activity** – both in the **manufacturing and services sectors.**
- It is a survey-based measure that asks the respondents about changes in their perception of some key business variables from the month before.
- It is calculated separately for the manufacturing and services sectors and then a composite index is constructed.
- The index helps in determining whether the market conditions, as seen by purchasing managers, is expanding, contracting or staying the same.
- There are **two types** of PMI **— Manufacturing PMI and Services PMI.**

How is the manufacturing PMI derived?

- It is derived by sending fact-based questions to a large number of companies in the concerned sector.
- The questions are related to 5 key variables. The variables with their weights in the index are — **new orders** (30%), output (25%), **employment** (20%), **suppliers' delivery times** (15%) and **stock of items purchased** (10%).
- The surveys are **conducted on a monthly basis.**
- A PMI number greater than 50 indicates expansion in business activity.
- A number less than 50 shows contraction. The rate of expansion is also judged by the difference from the mid-point (50) and also by previous month's data.

- PMI data **for India is released by S&P Global** - a global major in financial information and analytics.
- Earlier PMI data in India was released by IHS Markit before its merger with S&P.
- The Manufacturing PMI measures the performance of India's manufacturing sector and is derived after a survey of approx. 500 manufacturing companies.

Panchayat Development Index will help in comparing Panchayats in their progress of development goals across nine themes as well as in composite PDI score

Panchayat Development Index

- It is a **multi-domain and multi-sectoral index** that is intended to be used to **assess** the overall holistic development, **performance & progress of panchayats**.
- It takes into account **various socio-economic indicators** and parameters to gauge the well-being and development status of the local communities within the jurisdiction of a panchayat.
- It would play a significant role for performance evaluation and progress assessment in achieving the **localization of Sustainable Development Goals in rural area.**
- Under this the Local Indicators Framework on **nine themes of Localization of Sustainable Development Goals** was prepared.
- The **nine themes** taken into account are **poverty free and enhanced livelihood in village**, **healthy village**, child friendly village, water sufficient village, clean and green village, village with self-sufficient infrastructure, socially just and socially secured villages, village with good governance, and women friendly village.
- **Ranks:** This Index ranks panchayats on the basis of scores, and categorises them into **four grades.**
    - Those with scores under **40 per cent fall in grade D**, 40-60 per cent in grade **C,** 60-75 per cent in grade **B,** 75 to 90 per cent in category **A,** while those scoring **above 90 per cent** will be categorised as **A+.**
- **Significance:**
    - It shall provide valuable insights into the areas that require attention for improvement within the rural areas under the jurisdiction of the panchayats.
    - It helps in identifying disparities, achievement of development goals, and formulating targeted policies and interventions to enhance the overall well-being and quality of life of rural communities.

Union Cabinet approves allocation of Rs 2,500 crore for Interest Equalisation Scheme

Interest Equalisation Scheme (IES):

- It was first implemented on 1st April, 2015, to provide pre- and post-shipment export credit to exporters in rupees.
- It was initially valid for 5 years, up to 31.3.2020. The scheme has been continued thereafter, including a one-year extension during COVID and further extensions and fund allocations.
- The scheme shall be implemented by the RBI through various Public and non-Public Sector banks who provide pre- and post-shipment credit to the exporters.
- The Scheme is jointly monitored by the **Directorate General of Foreign Trade (DGFT)** and the RBI through a consultative mechanism.
- The scheme **helps the identified export sectors** to be internationally competitive and to achieve a high level of export performance.
- The scheme is primarily meant for the labour-intensive sectors.
- **Features:**
    - An eligible exporter has to submit a certification from the external auditor to the concerned bank to claim this benefit.
    - Banks provide IES benefits to the eligible exporters and claim a reimbursement from the RBI based on the external auditor certification furnished by the exporter.
    - Currently, the Scheme provides an **interest equalisation benefit at the rate of 2%** on pre- and post-shipment rupee export credit to merchant and manufacturer exporters of 410 identified tariff lines at 4-digit level and 3% to all MSME manufacturer exporters.
    - The Scheme has now been made fund-limited, and the benefit to individual exporters has been capped at Rs 10 Crore per annum per IEC (Import Export Code).
    - In addition, the banks that lend to exporters at an average rate of more than Repo + 4% would be debarred under the Scheme.

Inflation damper on Goldilocks Effect, RBI projects growth to hit 7 per cent this fiscal

Goldilocks Effect

- The Goldilocks Effect, or the Goldilocks Principle, is **the premise that people are inclined to seek 'just the right' amount of something.**
- **People prefer something** that is **neither too extreme nor too moderate but** falls **within an optimal or desirable range**, fitting their specific needs or preferences.

- The concept is derived from the children''s story of Goldilocks and the Three Bears, where Goldilocks preferred the porridge, chair and bed that were neither too hot nor too cold, too big nor too small, but just right.
- It has a place in several fields and disciplines. It **applies to elements of psychology, hard sciences, economics, marketing and engineering**, and each one has its own twist on how the principle is applied.
- **Goldilocks Pricing:**
- It is one of the effect''s more prominent applications. It's a psychological pricing strategy that rests **on the concepts of**
- **Product differentiation**
- **Comparative pricing**
- **Bracketing**
- **Product differentiation** is the practice of **distinguishing certain products from others.**
- Businesses can only leverage the Goldilocks Effect if they can differentiate their own products from one another.
- This then needs to be **combined with** something known as **comparative pricing where businesses offer multiple versions of a product simultaneously** of varying quality, **attached to corresponding price points.**
- It ultimately informs a comparative pricing strategy involving three options. **One that''s too high** for most, **one that''s too low** for most, and **one that''s just right.**
- When done right, the strategy all**ows a business to appeal to various parts of the market**registering with premium buyers, standard consumers and discount seekers.

SEBI proposes slashing NCD face value from Rs one lakh to Rs 10,000

Preference Shares

- Preference shares, more commonly referred to as preferred stock, are **shares of a company's stock with dividends that are paid** out to shareholders **before common stock dividends are issued.**
- **If the company enters bankruptcy**, **preferred stockholders are entitled to be paid** from company assets **before common stockholders.**
- **Non-Convertible v/s Convertible Preference Shares:**
  - Preference shares that can be **easily converted into equity shares** are **known as convertible preference shares.**
  - Non-Convertible preference shares are those shares that cannot be converted into equity shares.
- **Redeemable v/s Non-Redeemable Preference Shares:**
  - **Redeemable preference shares** are those shares that **can be repurchased or redeemed by the issuing company** at a fixed rate and date. These types of shares help the company by providing a cushion during times of inflation.

- Non-redeemable preference shares are those shares that cannot be redeemed or repurchased by the issuing company at a fixed date. Non-redeemable preference shares help companies by acting as a lifesaver during times of inflation.

- **Other Types:**
  - **Cumulative preference shares**: Some preference shares also **receive arrears of dividends,** which are called cumulative preference shares.
  - **Participating preference shares:** These **help shareholders demand a part in the company's surplus profit at** the time of the **company's liquidation** after the dividends have been paid to other shareholders. However, these shareholders receive fixed dividends and get part of the surplus profit of the company along with equity shareholders.
  - **Non-Participating preference shares**: These do not benefit the shareholders the additional option of earning dividends from the surplus profits earned by the company, **but they receive fixed dividends** offered by the company.
  - **Adjustable Preference Shares**: In the case of adjustable preference shares, the **dividend rate is not fixed and is influenced by current market rates.**

Debentures

- A debenture is a type of bond or other **debt instrument that is unsecured by collateral.**
- Since debentures have no collateral backing, they must **rely on the creditworthiness and reputation of the issuer** for support.
- **Both corporations and governments** frequently **issue debentures to raise capital** or funds.
- Similar to most bonds, debentures may **pay periodic interest payments** called **coupon payments.**
- **Convertible vs. Nonconvertible:**
  - **Convertible debentures** are bonds that **can be converted into equity shares** of the issuing corporation **after a specific period**.
  - They are attractive to investors that want to convert to equity if they believe the company''s stock will rise in the long term.
  - However, the ability to convert to equity comes at a price since **convertible debentures pay a lower interest rate** compared to other fixed-rate investments.
  - **Nonconvertible debentures** are traditional debentures that c**annot be converted into equity** of the issuing corporation. To compensate for the lack of convertibility investors are **rewarded with a higher interest rate when compared to convertible debentures.**

Investment by EPFO in ETFs crosses Rs 2.5 trillion

Exchange-Traded Funds (ETFs)

- An ETF is a **collection of marketable securities that tracks an index**, **a commodity**, bonds, **or a basket of assets.**
- In simple terms, ETFs **are funds that track indexes** such as CNX Nifty, or BSE Sensex, etc.
- An ETF **can be structured to track anything from the price of an individual commodity to** a large and **diverse collection of securities**. ETFs can even be structured to track specific investment strategies.
- ETF funds are somewhat **similar to mutual funds in terms of** their **structure, regulation, and management**. Additionally, just like mutual funds, they are a pooled investment vehicle that offers diversified investment into various asset classes like stocks, commodities, bonds, currencies, options, or a blend of these.
- **Unlike mutual funds**, **ETFs can be purchased or sold on a stock exchange** in the same way that regular stocks can.
- The **traded price of an ETF changes throughout the day** like any other stock, as it is bought and sold on the stock exchange.
- The trading value of an ETF is **based on the net asset value of the underlying stocks** that it represents.
- ETFs **typically have higher daily liquidity and lower fees than mutual fund** schemes, making them an attractive alternative for individual investors.

Employees Provident Fund Organisation (EPFO)

- It is a **statutory body** under the **Employees" Provident Funds and Miscellaneous Act**, 1952.
- It is under the administrative control of the **Union Ministry of Labor and Employment**.
- **Structure of EPFO:**
  - The Act and all its schemes are **administered by** a **tripartite board** called the **Central Board of Trustees.**
  - The board **comprises representatives of** the **Government** (**both Central and State**), **employers, and employees**.
  - The board is c**haired by the Union Minister of Labour and Employment**, Government of India.
- The Central Board of Trustees **operates three schemes:**
  - The **Employees' Provident Funds Scheme**, 1952 (EPF)
  - The **Employees' Pension Scheme**, 1995 (EPS)
  - The **Employees' Deposit Linked Insurance Scheme**, 1976 (EDLI)
- EPFO is also the **nodal agency for implementing Bilateral Social Security Agreements** with other countries on a reciprocal basis.
- **Coverage**: The schemes offered by EPFO cover **Indian workers and international workers** (from countries with whom the EPFO has signed bilateral agreements).

Zero Coupon Zero Principal (ZCZP) instruments

Unnati Foundation, a not-for-profit organization (NPO) dedicated to empowering underprivileged youth through skill training and employment placement, has made

history as the first entity to list on the National Stock Exchange''s Social Stock Exchange (SSE) in India.

Impact on Unnati Foundation (SUF)

Fundraising for Social Impact

- **Through the issuance of Zero Coupon Zero Principal (ZCZP) instruments,** SUF raised ₹1.8 crore. This funding will be directed toward training 10,000 underprivileged youths across states, aiming to facilitate their employment.
- This method of fundraising bypasses traditional grants and donations, presenting a sustainable and scalable approach to financing social initiatives.

Enhanced Credibility and Transparency

- Listing on the SSE provides SUF with a platform to showcase financial and social accountability.
- Transparency in fund utilization and reporting builds trust among potential donors and investors, potentially attracting more substantial and longer-term funding.

Impact Measurement and Reporting

- SSE''s requirement for annual impact reports, audited by social audit firms, ensures that SUF''s social impact is measured and documented.
- This data-driven approach allows stakeholders to track the effectiveness of their contributions, holding SUF accountable for its social mission.

Social Stock Exchange (SSE)

- The Social Stock Exchange (SSE) is a specialized platform within a larger stock exchange that **allows social enterprises and non-profit organizations (NPOs) to raise capital through the issuance of Zero Coupon Zero Principal (ZCZP) instruments.**
- Unlike traditional stock exchanges where companies issue shares or debt to raise capital, ZCZPs are non-tradable instruments with a face value of ₹1 each.
- Donors receive these ZCZPs in their demat accounts as a symbolic representation of their contribution to the NPO''s social cause.
- **NPOs that meet the SSE''s eligibility criteria can list their ZCZP offerings on the platform**. Investors can then purchase these ZCZPs through their demat accounts.
- The funds raised are used by the NPO to implement its social projects. At the end of the project period, the ZCZPs expire and hold no monetary value. However, donors have the satisfaction of knowing that their contribution has helped make a positive social impact.

Benefits of the SSE for NPOs

- **Access to capital:** The SSE provides NPOs with a new and innovative way to raise capital, which can be difficult for them through traditional means.
- **Enhanced credibility and transparency:** Listing on the SSE requires NPOs to meet certain disclosure and reporting standards, which can help to build trust with investors and the public.
- **Increased visibility and reach:** The SSE platform helps to raise awareness of NPOs and their work, which can lead to increased donations and support.
- **Improved impact measurement and reporting:** The SSE framework encourages NPOs to track and measure their social impact, which can help them improve their programs and demonstrate their effectiveness to donors.

Benefits of the SSE for investors

- **Invest in social impact:** The SSE allows investors to invest in causes they care about and make a positive social impact.
- **Diversification:** ZCZPs can be a good way to diversify an investment portfolio.
- **Tax benefits:** In some cases, donations made through the SSE may be eligible for tax deductions.

Challenges of the SSE

- **Limited awareness:** The SSE is still a relatively new concept, and many investors and NPOs are not yet aware of it.
- **Liquidity:** ZCZPs are not tradable, which means that investors cannot easily sell them before they expire.
- **Standardization**: There is a need for more standardized reporting and impact measurement frameworks for NPOs listed on the SSE.

Conclusion

- Unnati''s listing on the NSE SSE signals a promising trajectory for a more robust social impact investing ecosystem in India. By addressing challenges and leveraging opportunities, this model has the potential to drive significant social change and empower NPOs to fulfil their missions effectively. Continued support, education, and regulatory refinement will be crucial in nurturing and expanding this burgeoning landscape of impact investing.

World Bank's latest Migration and Development Brief

Recently, the **World Bank's latest Migration and Development Brief** was released.

Findings of the Brief

- Remittances to low- and middle-income countries (LMICs) **grew an estimated 3.8% in 2023, a moderation from the high gains of the previous two years.**
- In 2023, remittance flows to LMICs are estimated to have reached $669 billion as resilient labor markets in advanced economies and Gulf Cooperation Council (GCC) countries continue supporting migrants' ability to send money home.
- By region, remittance inflows grew for Latin America and the Caribbean (8%), South Asia (7.2%), East Asia and the Pacific (3%), and Sub-Saharan Africa (1.9%).
- Flows to the Middle East and North Africa fell for the second year, declining by 5.3% mainly due to a sharp drop in flows to Egypt. Remittances to Europe and Central Asia also fell by 1.4% after gaining more than 18% in 2022.

- The United States continued to be the largest source of remittances. The top five remittance recipient countries in 2023 are India ($125 billion), Mexico ($67 billion), China ($50 billion), the Philippines ($40 billion), and Egypt ($24 billion).
- Economies where remittance inflows represent substantial shares of gross domestic product (GDP) – highlighting the importance of remittances for funding current account and fiscal shortfalls – are Tajikistan (48%), Tonga (41%), Samoa (32%), Lebanon (28%), and Nicaragua (27%).
- Based on the trajectory of weaker global economic activity, growth of remittances to LMICs is expected to soften further to 3.1% in 2024. Driving the moderated forecast are a slowing economic growth and the prospect of weaker job markets in several high-income countries.
- Additional downside risks include volatile oil prices and currency exchange rates, and a deeper-than-expected economic downturn in high-income countries.
- During crises, migrants have weathered risks and shown resilience to support families back home. But high inflation and subdued global growth is affecting how much money they can send.
- Labor markets and social protection policies in host countries should be inclusive of migrants, whose remittances serve as a vital lifeline for developing countries."
- According to the Bank's Remittances Prices Worldwide Database, remittance costs remain persistently high, costing 6.2% on average to send $200 as of the second quarter of 2023. Compared to a year ago, sending money to all regions was more expensive, with the Middle East and North Africa being the exception.
- Banks continue to be the costliest channel for sending remittances (with an average cost of 12.1%), followed by post offices (7%), money transfer operators (5.3%), and mobile operators (4.1%).
- "Remittances are one of the few sources of private external finance that are expected to continue to grow in the coming decade. They must be leveraged for private capital mobilization to support development finance, especially via diaspora bonds.
- Remittance flows to developing countries have surpassed the sum of foreign direct investment and official development assistance in recent years, and the gap is increasing.
- A special section of the Brief describes how diaspora finances can be mobilized for development and strengthening a country's debt position. Diaspora bonds can be structured to directly tap diaspora savings held in foreign destinations.
- Many countries provide for non-resident deposits to attract diaspora savings. However, unlike diaspora bonds, such savings tend to be short-term and volatile.
- Future inflows of remittances can be used as collateral to lower the costs of international borrowings by developing countries.
- Due to their large size relative to other sources of foreign exchange, counter-cyclical nature and indirect contribution to public finances, remittances can also help improve a country's sovereign ratings and its ability to repay debt.

Regional Remittance Trends

- **Remittances to East Asia and the Pacific** increased by an estimated 3% to reach $133 billion in 2023. Excluding China, remittances to the region grew an estimated 7% to $83 billion in 2023, supported by the sustained growth in remittance flows to the Philippines, which has migrants in a well-diversified set of host destinations across the world. The average cost of sending $200 to the region was 5.9% in the second quarter of 2023. In 2024, remittance growth to the region is estimated to be 2.4%.
- **Remittance flows to Europe and Central Asia** are estimated to have declined by 1.4% to $78 billion in 2023. The subdued growth in 2023 is due mainly to an unusually high base level posted in 2022, driven by huge amounts of money transfers from Russia, and a lingering weakness in flows to Russia and Ukraine. Depreciation of the Russian ruble against the U.S. dollar has also decreased the value of money transfers from Russia. The average cost of sending $200 to the region was 6.9% in the second quarter of 2023 (excluding Russia). In 2024, remittances are projected to post a decline of 1.2%.
- **Remittance flows to Latin America and the Caribbean** are expected to increase by 8% to reach $156 billion in 2023. The strong labor market in the United States positively impacted remittance flows. Remittances to Mexico, the region's biggest recipient, are projected to increase by 9.7%. The growth of remittances is expected to be 45% in Nicaragua, 9% in Guatemala, and 7.5% in Colombia. The average cost of sending $200 to the region was 6.1% in the second quarter of 2023. Growth in remittances to the region is expected to slow to 4.4% in 2024.
- **Remittances to the Middle East and North Africa** are expected to decline again in 2023, falling by about 5.3% to $61 billion in 2023, driven mainly by a sharp drop in flows to Egypt. For Egypt, a significant gap between the official exchange rate and the parallel market likely caused a large part of remittances to be unrecorded. Meanwhile, remittance flows to the Maghreb countries experienced a gain, offsetting some of the decline. Sending $200 to the region cost 5.9% on average in the second quarter of 2023. In 2024, remittance flows are projected to recover to a 2.1% gain based on an expected turnaround in flows to Egypt.
- **Remittance flows to South Asia** are estimated to have grown 7.2% in 2023 to reach $189 billion, tapering off from the over 12% increase in 2022. The increase is attributable entirely to remittance flows to India, which are expected to beat previous forecasts by $14 billion and reach $125 billion in 2023. The key drivers of remittance growth in 2023 are a historically tight labor market in the United States, high employment growth in Europe reflecting extensive leveraging of worker retention programs, and a dampening of inflation in high-income countries. Sending $200 to the region cost 4.3% on average in the second quarter of 2023. In 2024, growth in remittance flows is expected to fall to 5% due to projected weaker economic growth in the United States, the Euro Area, and GCC countries, major hosts of migrant workers from the region.
- **Remittance flows to Sub-Saharan Africa** are expected to have increased by about 1.9% in 2023 to $54 billion, driven by strong remittance growth in Mozambique (48.5%), Rwanda (16.8%), and Ethiopia (16%). Remittances to

Nigeria, accounting for 38% of remittance flows to the region, grew by about 2%, while two other major recipients, Ghana and Kenya, posted estimated gains of 5.6% and 3.8%, respectively. Fixed exchange rates and capital controls are diverting remittances to the region from official to unofficial channels. In 2024, remittance flows to the region are projected to increase by 2.5%. Sending $200 to the region cost 7.9% on average in the second quarter of 2023.

World Bank Sets up Task Force on MDB Reforms

- The World Bank Group has established a **task force**to examine the recommendations of the **Independent Expert Group (IEG)** regarding the reform of multilateral development banks (MDBs).
- The group has suggested adopting a **triple mandate** of eliminating extreme poverty, boosting shared prosperity, and contributing to global public goods, tripling sustainable lending levels by 2030.
- It also recommended creating a **third funding mechanism,**which would permit flexible and innovative arrangements for purposefully engaging with investors willing to support elements of the MDB agenda.

What are Multilateral Development Banks (MDB)?

- Multilateral Development Banks are institutions whose members include **multiple developed and developing countries,**which have to fulfil certain lending obligations to facilitate developmental objectives.
- They provide **financial and technical assistance to developing countries.**
- Usually, **developed countries**in MDBs contribute to the lending pool while **developing countries primarily borrow** from these institutions to fund development projects.
- While commercial banks seek to make profits on loans and other financial services, the goal of MDBs is to issue grants and low-cost loans to improve the economic conditions of developing nations.
- **Some Multilateral Development Banks include:**World Bank Group, International Monetary Fund (IMF), Asian Development Bank (ADB), African Development Bank (AfDB).

Need for the Reforms

- **Efficacy in Dealing Challenges:**A reformed MDB ecosystem can equip stakeholders to better deal with global challenges in effective ways.
  - MDBs should operate more in sync with the **developmental priorities of individual nations.**
- **Involvement of Private Sector:**The expert group called for bringing private sector engagement to the centre of MDB operations by breaking away from the culture of limited operational interaction between their private and sovereign financing arms.
  - Given that MDBs need to ramp up financing to $390 billion by 2030, the private sector can play a pivotal role in making that happen by reversing the current trend of disappointingly low private financial flows.

- **Greater Involvement of Governments:**To mitigate coordination failures, the expert group has called for greater involvement of national governments to develop a home-grown unified vision of goals, policies, investments and financing.

Role of MDBs in India

- MDBs have played a crucial role in India's development journey by financing key infrastructure projects with longer gestation periods.
- **The World Bank,**established in 1944, has committed to lending worth $97.6 billion in India, including all active and closed projects.
    - Of the total commitments, 19 percent have been committed to projects in the public administration sector, 15 percent to the agriculture, fishing and forestry sector, and 11 percent to the transport sector.
- **The Asian Development Bank,**formed in 1969, has cumulatively committed to assistance worth $59.7 billion in India for project and technical assistance.
- The Beijing-headquartered **Asian Infrastructure Investment Bank (AIIB),** which was formed in 2016, has approved financing worth $9.9 billion in India.
- **The European Investment Bank,**established in 1958, has signed off on 22 projects in India with a cumulative value of Euro 4.5 billion.

All-India Consumer Price Index Numbers for Agricultural and Rural Labourers – November, 2023

The All-India **Consumer Price Index** Number for Agricultural Labourers and Rural Labourers for the month of November 2023 was increased recently.

Highlights

- CPI increased by 12 points and 11 points respectively to stand at 1253 and 1262 points respectively.
- There has been an upward trend in the index across all the states except West Bengal (both CPI-AL and CPI-RL indices decreased) and Himachal Pradesh (the CPI-AL index decreased).
- In the case of Agricultural Labourers, it recorded an increase of 1 to 10 points in 11 States, 11 to 20 points in 4 states and an increase of more than 20 points in 3 states.
- In the case of Rural Labourers, it recorded an increase of 1 to 10 points in 11 states, 11 to 20 points in 5 states and an increase of more than 20 points in 3 states.
- Andhra Pradesh and Tamil Nadu with 1439 points each topped the index table whereas Himachal Pradesh with 1015 points stood at the bottom.

- Among states, the maximum increase for CPI-AL was experienced by Maharashtra of 27 points which was mainly driven by the increased prices of jowar, rice, wheat atta, tapioca, arhar dal, onion and sugar etc.
- Point to point rate of inflation based on the CPI-AL and CPI-RL stood at 7.37% and 7.13% in November, 2023 compared to 7.08% and 6.92% respectively in October, 2023 and 6.87% and 6.99% respectively during the corresponding month of previous year.

Consumer Price Index:-

- The Consumer Price Index (CPI) **examines the weighted average of prices of a basket of consumer goods and services**, such as transportation, food and medical care.
- The CPI calculates the difference in the price of commodities and services such as food, medical care, education, electronics etc, which Indian consumers buy for use.

Type of CPI:-

- There are 4 different types of CPI measured:-

CPI for Industrial Workers (CPI-IW)

- It attempts to **quantify changes in the pricing of a fixed basket** of products and services used by Industrial Workers over time.
- **Released by: Labour Bureau**, Ministry of Labour and Employment.
- **Base Year: 2016.**

CPI for Agricultural Laborers (CPI-AL)

- It helps to revise minimum wages for agricultural labor in different States.
- **Released by: Labour Bureau**, Ministry of Labour and Employment.
- **Base Year:1986-87.**

CPI for Rural Labourer (CPI-RL)

- **Released by: Labour Bureau**, Ministry of Labour and Employment.
- **Base Year:1986-87.**

CPI (Rural/Urban/Combined)

- **Released by:** National Statistical Office (NSO), Ministry of Statistics and Program Implementation
- **Base Year: 2012.**

Calculation:–

- It is calculated by taking **price changes for each item in the predetermined basket of goods and averaging them.**
- The formula to calculate the Consumer Price Index (CPI) is as follows:
- **CPI = (Total cost of basket of goods and services in the current period / Total cost of the basket of goods and services in the base period) x 100.**

Uses:-

- To **calculate the inflation levels** CPI's annual percentage change is also used to assess inflation.
- To compute the **cost of living.**
- Determine the **purchasing power of a country's currency.**
- Understanding the real **value of wages, salaries, pensions, etc.**
- **Price regulation.**
- Provides insights into **consumer spending**

Significance:-

- Changes in the CPI are used to assess price changes associated with the **cost of living**.

House nod to raise age limit for GST appellate tribunal

- The Rajya Sabha has **returned a bill** to raise the **age limit of the President and members of the Goods and Services Tax (GST) Appellate Tribunals from 67 to 70 years** and 65 to 67 years, respectively, **aligning them with the age limits of other tribunals.**
- The **Central GST (Second Amendment) Bill, 2023**, was **introduced by Union Finance Minister Nirmala Sitharaman.**
- The amendment aims to **address issues arising from the Madras High Court's 2019 decision to strike down the formation of GST Appellate Tribunals**, necessitating amendments to the GST Act in July 2023.
- The Bill **also allows members of the Bar with 10 years of experience to serve as judicial members of the tribunals**.
- The Rajya Sabha **also returned the Provisional Collection of Taxes Bill, 2023,** which **replaced the Provisional Collection of Taxes Act, 1931**. Both bills were passed by the Lok Sabha on the preceding day.

Goods and Services Tax (GST)

- GST is an indirect tax that **came into effect from 1 July 2017** through the implementation of the **101st Amendment to the Constitution of India** by the Indian government.
- It has actually replaced **various indirect taxes** such as – **service taxes, VAT, excise** and others in the country.
- GST rates are divided into f**ive different tax slab**s for collection of tax – **0%, 5%, 12%, 18% and 28%.**
- There are three types of GST i.e**State Goods and Services Tax (SGST), Central Goods and Services Tax (CGST) and the Integrated Goods and Services Tax(IGST)**

GST Council

- GST Council is a **constitutional body** for making recommendations to the Union and State Government on issues related to **Goods and Service Tax.**
- It makes **recommendations to the Union and State Government** on issues related to Goods and Service Tax and was introduced by the Constitution (**One Hundred and First Amendment) Act, 2016.**
- As per **Article 279A** of the amended Constitution, the **GST Council which will be a joint forum of the Centre and the States**, shall consist of the following members: –

- **Union Finance Minister – Chairperson**
- **The Union Minister of State, in-charge of Revenue of finance – Member**
- **The Minister In-charge of finance or taxation or any other Minister nominated by each State Government – Members**

- As per **Article 279A (4)**, the Council will make **recommendations to the Union and the States on important issues** related to GST, like the goods and services that may be subjected or exempted from GST, model GST Laws, principles that govern place of Supply, threshold limits, GST rates including the floor rates with bands, special rates for raising additional resources during natural calamities/disasters, special provisions for certain States, etc.
- **Every decision of the Goods and Services Tax Council** shall be taken at a meeting by a **majority of not less than three-fourths** of the weighted votes of the members present and voting, in accordance with the following principles, namely:
  - The **vote of the Central Government** shall have a weightage of **one third of the total votes cast, and**
  - The **votes of all the State Governments** taken together shall have a **weightage of two-thirds of the total votes cast,** in that meeting.

GST Appellate Tribunal

- The Central Goods and Service Tax Act, 2017 in **Section 109 mandates for the constitution of a GSTAT and its Benches.**
- The GSTAT is the **specialized appellate authority for resolving disputes under the GST laws.**
- **Composition:**
  - The GST Tribunal will have **one principal bench in New Delhi** and as many **benches or boards in states as decided by each state**, subject to approval of the council.
  - **North-eastern states could opt for one bench for 2-3 states** and an additional bench for very far-flung areas.
  - The **principal bench and state boards would have two technical and two judicial members** each, with equal representation from the Centre and states.
  - **All four members would not sit for hearing each case**. It depends on the **threshold or value of dues involved.**

Show norms being complied with for event planned at sanctuary

Asola Bhatti Wildlife Sanctuary

- **Location**:
  - The sanctuary covers an area of 32.71 sq. km on the **Southern Delhi Ridge of** the **Aravalli hill range** on the **Delhi-Haryana border**.
  - It lies in **Southern Delhiand** the northern **parts of** Faridabad and Gurugram districts of **Haryana state**.
- It is also **part of the Sariska-Delhi Wildlife Corridor**, which runs from the Sariska Tiger Reserve in Rajasthan to Delhi Ridge.
- **Vegetation**:

- As per Champion & Seth (1968), the vegetation falls under the **Northern Tropical Thorn Forests type.**
- The native **plants exhibit xerophytic adaptations** such as thorny appendages, wax-coated, succulent, and tomentose leaves.

- **Climate**: It is mainly **influenced by its remote inland position** and prevalence of air of continental character, which is characterized by **extreme summer heat alternating with great winter cold.**
- **Flora**: Consists of **Prosopis juliflora as the dominant exotic species** and **Diospyros montana as the dominant native species** in the sanctuary.
- **Fauna**: **Golden Jackals, Striped-Hyenas, Indian crested-Porcupines**, Civets, Jungle Cats, Snakes, Monitor Lizards, Mongoose etc.

COP28 talks open in Dubai with breakthrough deal on loss and damage fund

Loss and Damage Fund

- It was first announced during **COP27 in Sharm el-Sheikh, Egypt.**
- It is a **global financial package** to **ensure the rescue and rehabilitation** of countries facing the cascading effects of climate change.
- The term refers to **the compensation** that rich nations, whose industrial growth has resulted in global warming and driven the planet into a climate crisis, must pay to poor nations, whose carbon footprint is low but are facing the brunt of rising sea levels, floods, crippling droughts, and intense cyclones, among others.
- The changing climate has impacted lives, livelihoods, biodiversity, cultural traditions, and identities.
- Loss and damage is often categorised as **either economic or non-economic.**
  - **Economic loss** and damage are negative impacts that one can assign a monetary value to. These are things such as the costs of **rebuilding infrastructure that has been damaged due to floods** or the loss of revenue from crops that were destroyed due to drought.
  - **Non-economic loss** and damage are **negative impacts** where it is difficult or infeasible to assign a monetary value. These are things such as **trauma from experiencing a tropical cyclone**, loss of community due to displacement of people, or loss of biodiversity.
- The **World Bank will oversee the loss and damage fund** in the beginning, with the source of funds being rich nations such as the US, the UK, and the EU, as well as some developing countries.

India-Sweden Industry Transition Partnership, LeadIT 2.0 Launched at COP28 Dubai

Leadership Group for Industry Transition (LeadIT) 2.0:

- Since its inception **in 2019,** LeadIT has grown into a collaborative effort **involving 18 countries and 20 industry-leading companies.**

- The LeadIT initiative, initially **centered around** pivotal sectors such **as iron, steel, cement, and aluminum**, focused on industry transition and knowledge sharing.
- LeadIT has played a pivotal role in accelerating the **adoption** of **low-carbon technologies**, aligning with global environmental goals.
- **Three core areas of LeadIT 2.0:**
  - **Inclusive and Just Industry Transition**: Ensuring that industry transitions are not only efficient but also equitable, promoting fairness and inclusivity in the process.
  - **Low Carbon Technology Development and Transfer**: Placing renewed emphasis on the development and seamless transfer of low-carbon technologies, crucial for achieving sustainable practices across industries.
  - **Emerging Economy Technology Transfer:** Facilitating the expedited transfer of innovative solutions to emerging economies, assisting in their transition to more sustainable practices.
- It serves as a platform for public-private collaboration, fostering sector-specific and cross-sectoral learning, especially concerning innovation opportunities and new technologies.

National Green Tribunal seeks action on elephant deaths on Dooars rail track in Alipurduar

Buxa Tiger Reserve (BTR)

- **Location**: It lies in the Alipurduar sub-division of the Jalpaiguri district of **West Bengal.**
- Its **northern boundary runs along** the international **border with Bhutan**.
- The **Sinchula hill range lies** all along the **northern side** of BTR, and the **eastern boundary touches** that of **Assam State.**
- It got its **name from Buxa Fort,** which is located on the Sinchula Range at an altitude of 867 metres.
- The fragile "**Terai Ecosystem**" constitutes a **part of this reserve**.
- It serves as an **international corridor for elephant migration** between India and Bhutan.
- Two rivers, namely the **River Raidak** and the **River Jayanti,** flow through the forest of Buxa.
- **Vegetation**: The forests of the reserve can be broadly classified as the '**Moist Tropical Forest'** of Champion and Seth's (1968) recent classification.
- **Flora**: Some of the important species are **Sal, Champa, Gamar, Simul,** and Chikrasi.
- **Fauna**: The main species include the **Tiger, elephant, leopard cat, gaur, wild boar**, sambar, hog deer, Chinese pangolin, etc.

COP28: Germany unveils Climate Club to tackle industrial emissions

Climate Club

- It is **led by Germany and Chile,** the Club has garnered support **from 36 member countries** including Kenya, the European Union, Switzerland and others.
- It aims to make **decarbonisation of industries** successful for climate and businesses, through ambitious policies, alignment of methodologies and standards and improving finance and assistance for emerging and developed economies.
- The activities of the club are divided into **three key pillars: -**
  - **Pillar 1:** Advancing ambitious and transparent climate change mitigation policies.
  - **Pillar 2:** Transforming industries
  - **Pillar 3:** Boosting international cooperation and partnership
- Two co-chairs will be elected for **two-year terms** for the Club. Currently, Germany and Chile serve as the co-chairs.
- A body of members will determine the scope and approve the work programme, budget and amendments.
- Furthermore, **a steering group will be formed** to support the body of members when **the Club reaches 40 members.**
- A s**ecretariat** will be formed to implement the work program.
- Currently, **Organisation for Economic Co-operation and Development** and **International Energy Agency** are the joint interim heads of secretariat.

UNCCD launches 'Global Drought Snapshot' report at COP28 in collaboration with International Drought Resilience Alliance (IDRA)

Report

- **Agriculture and forests**
  - 70% cereal crops were damaged by drought in the Mediterranean, 2016–2018.
  - 33% loss of grazing land in South Africa due to drought
  - Five consecutive rainfall season failures in the Horn of Africa, caused the region's worst drought in 40 years, contributing to reduced agricultural productivity, food insecurity and high food prices.
  - Africa's drought-related economic losses in the past 50 years at $70 billion.
- **Water conditions**
  - 75% reduction of cargo capacity of some vessels on the Rhine due to low river levels in 2022, leading to severe delays in shipping arrivals and departures
  - 5 million people in southern China affected by record-low water levels in the Yangtze River due to drought and prolonged heat

- **Social dimensions**
  - 85% of people affected by droughts live in **low-or middle-income countries.**
  - 2 million people in the Central American Dry Corridor needing food aid after **five years of drought, heatwaves and unpredictable rainfall.**

UN Convention to Combat Desertification (UNCCD)

- It is one of three Conventions **originated at the 1992 Earth Summit** in Rio de Janeiro. (The other two address climate change (UNFCCC) and biodiversity (UN CBD).
- It is the **only legally binding framework** set up to address desertification and the effects of drought.
- There are **197 Parties to the Convention**, including 196 country Parties and the European Union.
- The Convention – based on the principles of **participation, partnership and decentralisation** – is a multilateral commitment to mitigate the impact of land degradation, and protect our land so we can provide food, water, shelter and economic opportunity to all people.
- Parties to the Convention meet **in Conferences of the Parties** (COPs) **every two years**, as well as in technical meetings throughout the year, to advance the aims and ambitions of the Convention and achieve progress in its implementation.

COP28 UAE: Methane Alert and Response System alerted governments of 127 plumes spanning four continents

Methane Alert and Response System

- It is a **data-to-action initiative** with the mission to put open, reliable, and actionable data into the hands of individuals who can **reduce methane emissions.**
- It was announced at the **Conference of Parties (COP 27)** in November 2022 and began its initial pilot phase in January 2023.
- The pilot phase presented an opportunity for UNEP's **International Methane Emissions Observatory (IMEO)**to engage with partners, countries, and operators to refine MARS processes and procedures before making data public.
- It uses satellites to scan the globe for major emission sources and alerts countries and companies so that they can take methane action and **accelerate progress supporting the Paris Agreement and Global Methane Pledge.**
- This initiative works in partnership **with the Climate and Clean Air Coalition** (CCAC) and the **International Energy Agency (IEA).**
- MARS brings together **four critical components** to drive transparency and enable emission reductions:
  - **Detection of large sources** of human-caused methane emissions.
  - Notification of relevant countries and companies about these detected emissions.
  - **Response** from notified stakeholders to address the emissions.

- **Tracking progress of actions** taken to reduce emissions and collaboration to prevent future methane.

International Methane Emissions Observatory (IMEO)

- It was **presented at the G20 Leaders'** Summit in 2021.
- It focused initially on emissions of Methane from the fossil industry.
- It reconciles methane data from scientific measurement studies, satellites through the Methane Alert and Response System (MARS), rigorous industry reporting through the Oil and Gas Methane Partnership 2.0 (OGMP 2.0), and national inventories.
- The Oil & Gas Methane Partnership 2.0 (OGMP 2.0) is **UNEP's flagship programme** that includes a partnership of companies to improve the accuracy and transparency of methane emissions data from the oil and gas sector through a committed framework.

Old video of giant ancient salamanders discovered in southwest China cave sparks conservation concerns

Salamanders

- A salamander is an **amphibian** with a **slender body** and a **long tail.**
- They encompass approximately 500 species of amphibians.
- Most salamanders **look like a cross between a lizard and a frog**. They have **moist, smooth skin, like frogs,** and **long tails, like lizards.**
- **Distribution:**
  - Salamanders range in **North America, Europe**, **Asia**, the northern parts of **South America,** and **North Africa**.
  - The **highest population** of this genus concentrates **in the Appalachian Mountains** in North America. Almost **one-third** of their global population **lives in North America.**
- **Habitat**: They live **in or near water** or find shelter on moist ground and are typically found in **brooks, creeks, ponds,** and other moist locations, such as under rocks.
- **Features:**
  - **Body**: Their bodies are usually **cylindrical** in shape with almost **flattened undersides.** The **body starts right after the head** and is **not separated by the neck**.
  - They have **triangular-shaped heads** with a **wide mouth** and two eyes on the sides of their heads.
  - **Size**: Their size **varies with different species**, ranging from 2.5 cm to 20 cm. The **largest salamander** in the world **is the Chinese Giant Salamander,** which can grow up to a length of 5 feet.
  - They are **cold-blooded** and their temperature changes with their habitat.

- **Regeneration**: They are **capable of regenerating lost limbs** within a few weeks, including tails and toes, allowing them to survive attacks from predators.
- They are **nocturnal**.
- Some salamander species **can be poisonous,** and some even have teeth.

Protest staged against proposed dam on Painganga river

Painganga River

- The Painganga River (also known as the Penganga River) is the **chief river of** the **Yavatmal district in Maharashtra** and flows along the south-east boundaries of the district in a **winding, meandering course**.
- **Origin**: It originates in the **Ajantha ranges** in Aurangabad district **in Maharashtra.**
- It is a major **tributary of the Wardha River**, the other major river in the district. The **Wardha River flows into** the **Wain Ganga Riverto form** the **Pranhita River,** which finally **joins the Godavari River**.
- It is acutely **deep-rooted** and **difficult to navigate.**
- The total length of the river is **676 km.**
- **Major Tributaries**: Include the **Adan, Kas,** Arunavati,Kayadhu, and **Pus Rivers**.
- The Penganga River gets flooded in the rainy and winter seasons and partially flooded in the summer.
- It provides irrigation to the Washim and Yavatmal districts in Maharashtra.
- There are **two dams being constructed** on the river, namely **Upper Painganga and Lower Painganga.** This dam is also known as **Isapur Dam.**

A pregnant megamouth shark found on a Philippines beach was the first ever seen — and it solved a long-standing mystery

Megamouth Shark:

- It is an **extremely rare** and unusual **species of deep-water shark**.
- **Scientific Name: Megachasma pelagios.**
- **Distribution**:
  - Their range is believed to span the region between **latitudes 40°N and 40°S.**
  - These sharks inhabit the **Atlantic, Indian, and Pacific oceans**.
- **Habitat**: They are found in **deep, warm oceanic water.**
- This species has **only been observed** in the wild a **few times, and less than 60 individuals are known** by scientists **to have ever been captured or observed**.
- **Features**:
  - It is a **large species**, reaching weights of 2700 pounds (1215 kg).
  - They are typically 425-515 cm long. Females are larger than males.

- They are easily **recognised by their huge, soft head** and **large mouth,**which is positioned at the anterior margin of the head.
- The colour varies from **grey to blueish-black above** and is **pale grey below**.
- They have a **series of small, hooked teeth** along their top and bottom jaws.
- They are **filter feeders,** and they swim with their mouths constantly wide open in order to filter out their preferred planktonic prey.
- The inside of their **mouths is covered with light-producing organs** that may be used to **attract pelagic crustaceans** and other potential prey.

- **Conservation Status:**
  - **IUCN Red List: Least Concern**

Global Initiative launched to accelerate Climate Action in Oil and Gas Sector
Oil and Gas Decarbonization Charter:

- It is a dedicated initiative for the oil and gas sector.
- It aims to induce substantial impact in addressing climate challenges.
- **Currently, 50 companies,** collectively responsible for over 40 percent of global oil production, have committed to the OGDC.
- National Oil Companies have shown historic participation, constituting over 60 percent of the total signatories, marking a noteworthy shift towards decarbonization within this sector.
- It is integral to the **Global Decarbonization Accelerator (GDA).**

Global Decarbonization Accelerator:

- It was introduced at the World Climate Action Summit.
- The GDA focuses on three primary pillars:
  - Scaling the energy system of the future.
  - Decarbonizing the present energy system.
  - addressing methane and other non-CO2 greenhouse gases.
- This strategic plan aims for a comprehensive and simultaneous transformation of both energy demand and supply.

Clean Ganga mission signs pact with Mississippi river initiative
River Cities Alliance:

- It was launched in 2021.

- It is a first-of-its-kind Alliance in the world, symbolising the successful partnership of the two Ministries i.e., **the Ministry of Jal Shakti and the Ministry of Housing and Urban Affairs.**
- **Objective:** To provide the member cities with a platform to discuss and exchange information on aspects that are vital for **sustainable management of urban rivers,** sharing best practices and supporting innovation.
- The Alliance is open to all river cities of India. Any river city can join the Alliance at any time.
- The alliance has been launched **initially with 30 cities** namely Dehradun, Rishikesh, Haridwar, Srinagar, Varanasi, Kanpur, Prayagraj, Farrukhabad, Mirzapur, Mathura, Bijnor, Ayodhya, Patna, Bhagalpur, Begusarai, Munger, Sahibganj, Rajmahal, Howrah, Jangipur, Hugli-Chinsurah, Berhampore, Maheshtala, Aurangabad, Chennai, Bhubaneshwar, Hyderabad, Pune, Udaipur and Vijayawada.
- It focuses on three broad themes- **Networking, Capacity Building and Technical Support.**
- The Secretariat of the Alliance is set up at the **National Institute for Urban Affairs (NIUA).**

India Takes the Lead in Green Shipping

Green Voyage2050 Project

- The overall goal of the Project is to support effective implementation of the **Initial IMO GHG Strategy.**
- It provides **support to developing countries** in their efforts to reduce **Greenhouse Gas** emissions from ships.
- The Initial IMO Strategy sets out a clear vision and levels of ambition, one of which is to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008.
- It is envisaged that the project will strengthen **MARPOL Annex VI compliance,** facilitate sharing of operational best practices, catalyse the uptake of energy efficient technologies and explore opportunities for low- and zero-carbon fuels.
- **Components of the project**
  - **Component 1 –** Developing global tools to support implementation of the Initial IMO GHG Strategy
  - **Component 2 –** Capacity building, policy and NAP development
  - **Component 3 –** Strategic partnership development
  - **Component 4 –** Technology cooperation, innovation and pilot demonstrations
- **Partnering Countries:**
  - The countries participating in the GreenVoyage2050 Project are: Azerbaijan, Belize, China, Cook Islands, Ecuador, Georgia, India, Kenya, Malaysia, Solomon Islands, South Africa, Sri Lanka.

- These countries are participating as either a New Pilot Country (NPC) or a Pioneer Pilot Country (PPC).

- The GreenVoyage2050 Project, currently in its first phase, is funded by the **Norwegian Ministry of Climate and Environment** for an initial period up to December 2023 (NOK 64.5 million).

New Species of Forest Hedgehog Discovered in China

Mesechinus orientalis:

- It is a new species of Hedgehog.
- It is currently known from southern Anhui and northwestern Zhejiang, both in eastern China.
- It is currently the southeasternmost species of Mesechinus (Mesechinus is a small genus of mammals in the hedgehog family).
- **Habitat:** It can be found in scrubland and subtropical broad-leaf evergreen forests at elevations from 30 to 700 m.
- **Features:**
  - It is a small-bodied hedgehog.
  - It has the shortest spines in the genus (1.8-2 cm).
  - There are four colour rings on the spine, from the base to the tip.
  - The nose is brown, with black whiskers on the snout; these whiskers shorten towards the nose.
  - The ears are small and nearly the same length as the surrounding spines.
  - It appears to be sexually dimorphic. The pelage of males is generally gray, while that of most of the females is reddish brown.

Hedgehog

- Hedgehogs are a distinctive group of spiney insectivorous mammals comprising the subfamily Erinaceinae of the Erinaceidae family.
- They are found across Eurasia and Africa but absent from Australia and the Americas.
- Their most notable features are their spines, which are enlarged hollow hairs, and ability to roll into a ball when frightened, presenting only these spines to the outside world.

Green turtles nesting range expands under warming climate

Green Turtle

- The Green turtle (Chelonia mydas)is one of the **largest sea turtles** and the only **herbivore** among the different species.
- They are in fact named for the greenish color of their cartilage and fat, not their shells.
- In the Eastern Pacific, a group of green turtles that have darker shells are called black turtles by the local community.
- They graze on seagrasses and algae, which maintains the seagrass beds and makes them more productive.
- These species migrate long distances between feeding grounds and the beaches from where they hatched.
- They are potentially particularly susceptible, as the sex of their offspring is dependent on incubation temperature.
- **Distribution:** Green turtles are found mainly in **tropical and subtropical waters.**
- **Conservation status**
- **IUCN: Endangered**
- **CITES:** Appendix 1
- **Threats:** Habitat loss, fisheries by catch and illegal trade etc.

Mediterranean Sea

- It is an **intercontinental sea** that is bordered by the continent of **Europe** in the north, by **Asia** in the east, and by **Africa** in the south.
- In the west, the Mediterranean Sea is connected to the **Atlantic Ocean** via the narrow **Strait of Gibraltar**.
- In the extreme northeast, it is connected to the **Black Sea**via the **Dardanelles Strait**, the Sea of Marmara, and the Bosporus Strait.
- The Mediterranean Sea is also connected to the Red Sea via the Suez Canal in the southeast.
- **Climate:** The region is characterized by the prevailing subtropical climate known as the **Mediterranean climate**, with usually mild, wet winters and hot, dry summers.
- Mediterranean Sea waters are **more saline compared** to the waters of the Atlantic. There is a continuous movement of water from the Atlantic into the Mediterranean and vice versa through the Strait of Gibraltar.

Government Approves Cheetah Breeding Centre in Gujarat

Banni Grassland

- It is located along the northern border of **Kachchh district in** the State of
- It is **one of the larget grasslands in** the **Indian subcontinent** with an area of over 2500 sq. km.
- **Many factors** have **served to shape Banni** over time, including the **damming of rivers,** the **introduction and spread of** the **invasive Prosopis**

juliflora tree, and the continually varying composition and density of **livestock that have grazed these grasslands** for many centuries.

- The Banni is also home to **22 ethnic groups**, the **majority of whom are pastoralists**, spread across 48 settlements in 19 Panchayats, with a population of close to 40,000 people.
- It is home to **great biological diversity**, having 37 grass species, 275 bird species, and domesticated animals like Buffalo, Sheep, Goat, Horses and Camel, as well as wildlife.
- The **Kutch Desert Wildlife Sanctuary** which spans over an area of 380 sq. km and the recently notified 227 Sq. km **Chhari Dhand Conservation** Reserve are **part of the Banni Grasslands.**
- **Flora**: The vegetation here **mainly comprises Prosopis Juliflora, Cressa critica, Cyperus** spp, Sporobolus, Dichanthium, and Aristida.
- Fauna:
- It is home to mammals such as the **Nilgai, Chinkara, Blackbuck, Wild boar, Golden** Jackal, Indian Hare, Indian Wolf, Caracal, Asiatic Wildcat and Desert Fox etc.
- The region also serves as a **breeding ground for the Banni buffalo and the Kankrej cow.**

UNICEF in collaboration with India to launch "Green Rising" initiative at COP28 Summit in Dubai today to mobilize youth to drive climate action

Green Rising Initiative

- This initiative focuses on **engaging youth** for **impactful environmental actions** at the grassroots level, aligning with the global effort to address the severe impacts of climate change.
- The global "Green Rising" initiative and the "Green Rising India Alliance" marks a collaborative effort involving UNICEF, Generation Unlimited, and a diverse network of public, private, and youth partners.
- The main goal is to mobilize millions of young people worldwide, encouraging their active participation in green initiatives addressing and adapting to the severe impacts of climate change on their communities.
- Through the **YuWaah campaign** in India, the focus is on engaging youth to drive impactful environmental actions at the grassroots level.

UNICEF

- The United Nations Children''s Fund was originally founded as the United Nations International Children''s Emergency Fund (UNICEF).
- It was founded by the UN General Assembly on 11 December 1946, to provide emergency food and healthcare to children and mothers in countries that had been devastated by World War II.

- It is a leading source of **information on the situation of children** around the world.
- It relies entirely on contributions from governments and private donors.
- The **Executive Board** is made up of **36 Member States**, elected to **three-year terms** by the Economic and Social Council, with the following regional allocation: Africa (8 seats), Asia (7), Eastern Europe (4), Latin America and Caribbean (5) and Western Europe and Others (12).
- **Headquarters:** New York City.

407-million year-old disease-causing fungus unveiled at Natural History Museum

Potteromyces asteroxylicola

- It was found infecting the **ancient plant Asteroxylon mackiei**, showcasing a predator-prey interaction that occurred while the plant was alive.
- The unique reproductive structures of Potteromyces, known as **conidiophores,** stood out with their unusual shape and formation, leading to its designation as a new species.
- Its reproductive structures, known as conidiophores, had an unusual shape and formation.
- Rhynie Chert site in Scotland is known for its well-preserved Early Devonian communities of plants and animals, including fungi and bacteria.

Devonian Period

- It is spanning between about **2 million and 358.9 million years ago.**
- It is sometimes **called the "Age of Fishes"** because of the diverse, abundant and in some cases, bizarre types of these creatures that swam Devonian seas.
- Forests and the coiled shell-bearing marine organisms known as ammonites first appeared early in the Devonian.
- Late in the period **the first four-legged amphibians** appeared, indicating the colonization of land by vertebrates.
- During the Devonian, there were **three major continental masses**: North America and Europe sat together near the equator, with much of their current area covered by shallow seas. To the north lay a portion of modern Siberia. A composite continent of South America, Africa, Antarctica, India, and Australia dominated the southern hemisphere.

2 tigresses captured for translocation to Nagzira

Navegaon Nagzira Tiger Reserve

- **Location**: It is situated in the Gondia and Shandara Districts of **Maharashtra**.
- It was declared a Wildlife Sanctuary in 1970. In 2012, the state government announced to merging this sanctuary with another national park to include in Tiger Project, now called as Nagzira Navegoan Tiger Reserve.

- It comprises **Nawegaon National Park**, N**awegaon Wildlife Sanctuary**, **Nagzira Wildlife Sanctuary, New Nagzira Wildlife Sanctuary,** and **Koka Wildlife Sanctuary.**
- It is **connected with** many surrounding **tiger reserves like Pench, Kanha, Tadoba Andhari** Tiger Reserve, Indravati Tiger Reserve etc.
- **Topography**: The topography is **undulating**, and the **highest point, viz. 'Zenda Pahad'**is around 702 m above mean sea level.
- **Vegetation**: **Southern Tropical Dry Deciduous Forest,**which includes dry mixed forests to moist forest type.
- **Flora**: There are 364 species of plants, and the major trees are: **Terminalia tomentosa, Lagerstroemia parviflora, Anogeisus lotifolia,** Pterocarpus marsupium, Diospyrus melanoxylon, Ougeinia oogenesis etc.
- **Fauna**: The major wild animals are: Tiger, Panther, Small Indian Civet, Palm Civet, Wolf, Jackal, Wild Dog, Sloth Bear, Ratel, Common Giant Flying Squirrel, Gaur, Sambar, Chital, Four Horned Antelope, Mouse Deer and Pangolin.

Royal Bengal tiger spotted in Sikkim

- The Royal Bengal Tiger was captured by trap cameras of a team **of Bombay Natural History Society (BNHS)** which is conducting a study in the sanctuary in collaboration with the Sikkim Forest department.
- It was under a larger project called "Conservation and Use of Five Wetlands in three Himalayan States to secure Habitats of Birds Migrating within the Central Asian Flyway (CAF)."
- This project was sanctioned under the **National Mission on Himalayan Studies** (NMHS), aims to protect and conserve wetland sites in **Ladakh, Himachal Pradesh, and Sikkim**.

Pangalokha Wildlife Sanctuary

- It is located in **East Sikkim district** and connected to the forests of **Bhutan and Neora Valley National Park in West Bengal.**
- The Pangolakha Range, extending below the Chola Range, separates Sikkim from Bhutan.
- **Vegetation:** The Sanctuary has typical **alpine-temperate-subtropical vegetation** with high altitude lakes around Jelep La.
- **Flora:** Rhododendron, Silver Fir, Juniper forest and associated ground flora, moss-filled oak forests with dense bamboo thickets etc.
- **Fauna:** It is home to a diverse range of charismatic species, including **red pandas**, snow leopards, Himalayan musk deer, Himalayan goral, and Himalayan black bears.

Clam makes comeback from extinction off shores of Croatia.

Pinna nobilis

- It is a large **species of Mediterranean clam**, a marine **bivalve mollusc** in the family Pinnidae.

- The clams, whose shells can grow as much as 1.2 m across, play an important ecological role by **filtering sea water** and allowing other **organisms to flourish**.
- It attaches itself to rocks using a strong byssus composed of many silk-like threads which used to be made into cloth.
- The animal **secretes these fibres** from its byssus gland; they consist of keratin and other proteins and may be as long as 6 cm (2.4 in). The inside of the shell is lined with brilliant mother-of-pearl.
- As with other members of its genus, **Pinna nobilis hosts symbiotic shrimp** which live inside its shell.
- It is believed that when it sees a threat, the shrimp warns the host, perhaps by retracting its claws or even by pinching. The clam then closes shut.
- It has been demonstrated that the shrimp has a similar filter-feeding diet to its host and the relationship is likely mutualistic.
- **Distribution:** This species is endemic to the Mediterranean Sea.
- **Threats:** It is relatively **fragile to pollution** and shell damage.
- The clam, known as the **noble pen shell** or pinna nobilis, started dying out as a deadly pathogen spread in parts of the Mediterranean around 2016.
- **Conservation status**
  - **IUCN: Critically endangered**

India Climbs to 7th Place in Global Climate Performance Index, Emphasizing Renewable Energy Gains

Climate Change Performance Index

- It is an instrument to enable transparency in national and international **climate politics.**
- It is published by **Germanwatch,** the New Climate Institute and the Climate Action Network **annually.**
- It was **first time** published in **2005.**
- The CCPI uses a standardized framework to compare the climate performance of 63 countries and the EU, which together account for over 90% of global greenhouse gas emissions.
- The climate protection performance is assessed in four categories: **GHG Emissions, Renewable Energy, Energy Use and Climate Policy.**

Key highlights

- Denmark retained the top spot with a score of 75.59 per cent. Estonia and the Philippines occupied the second and third ranks respectively, with 72.07 and 70.70.
- Saudi Arabia was at the bottom — 67th — in the performance list, while the host country United Arab Emirates occupied the 65th position.

- India receives a **high ranking in the GHG Emissions** and Energy Use categories, but a medium in Climate Policy and Renewable Energy, as in the previous year.
- India is **trying to meet** its **National Determined Contribution** (NDC), with clear long-term policies in place that focus on promoting renewable energy and providing financial support for domestic manufacturing of renewable energy components.
- India has relatively **high taxes on petrol and diesel**, which are intended to act as carbon taxes.

What stones inside fish ears are telling us about climate change

Otolith rings

- The otolith is a **stony lump** in **the fish ear**.
- These are much like tree rings which reveal fish''s age.
- Different forms or isotopes of oxygen in the otolith indicate the temperature the fish experienced when it was alive. Carbon isotopes reveal how quickly food was converted into energy.
- Fish carry their fitness trackers in their ears. They are commonly known as **"earstones," are hard, calcium carbonate** structures located directly behind the brain of bony fishes.
- There are three types of otoliths, all of which aid fish in balance and hearing:
    - **Sagitta:** The largest of the 3 pairs of otoliths, sagitta is involved in the detection of sound and the process of hearing, or converting sound waves into electrical signals.
    - **Asteriscus:** This type of otolith is involved in the detection of sound and the process of hearing.
    - **Lapillus:** This type of otolith is involved in the detection of gravitational force and sound.
- Different species have otoliths of different shapes and sizes; and cartilaginous fishes, such as sharks, skates, and rays, have none.
- **Significance:**
    - Features of otoliths can be used to identify the species, size, age, growth rate, and season of death of an individual fish.
    - Analysis of the **oxygen isotope** values of fish otoliths can provide information on the **temperature of the water** in which the fish lived.
    - While studying concentrations of trace elements such as barium can indicate the **salinity levels of the water.**

Earliest "true" saddle in east Asia discovered

Archaeologists have used radiocarbon dating to analyze the oldest true wooden frame saddle in East Asia, revealing how the rise of Mongolian steppe cultures was likely aided by advances in equestrian technology.

Radiocarbon Dating:

- Radiocarbon dating, or **carbon-14 dating**, is a scientific method that **can accurately determine the age of organic materials as old as** approximately **60,000 years.**
- First developed in the late 1940s at the University of Chicago by Willard Libby, the technique is **based on the decay of the carbon-14 isotope** (Carbon-14 is a **radioactive isotope** of carbon).
- It has been used for historical studies and atmospheric science.
- It can be **used on any object that used to be alive**. That includes pieces of **animals, people**, and **plants**, but **also paper** that was made from reeds, **leather** made from **animal hides**, **logs** that were used to build houses, and so forth.
- **How does it work?**
  - **Carbon 14** is continually **being formed in the upper atmosphere** by the effect of cosmic ray neutrons on nitrogen 14 atoms. It is rapidly oxidized in air to form carbon dioxide **and enters the global carbon cycle.**
  - **Plants and animals assimilate carbon 14**from carbon dioxide **throughout their lifetimes** into their tissues.
  - **When they die**, the **carbon-14 starts to change into other atoms** over time.
  - Scientists **can estimate how long the organism has been dead by counting the remaining carbon-14 atoms.**
  - Carbon-14 has a **half-life of about 5,730 years.** That means half the atoms in a sample will change into other atoms, a process known as "decay," in that amount of time.

A first-of-its-kind Eastern Ghats Nature Interpretation Centre in Visakhapatnam

Kambalakonda Wildlife Sanctuary

- It is located in the state of **Andhra Pradesh.**
- It is named after the local **hillock "Kambalakonda**" acting as a green lung for citizens of Vizianagaram, is this large and sprawling sanctuary.
- **Topography:** It is considerably hilly with steep slopes.
- **Vegetation:** It hosts **dry evergreen forests**, a highly-threatened and unique forest type seen only in Tamil Nadu and Andhra Pradesh in India.
- **Flora:**
  - It has wonderful plants like Tectona grandis, Randia dumetorum, Grewaia tiliaefolia, Abrus precatorius, etc.
  - One of the most stunning flowers found in the region includes the **Indian screw tree**. Other flowers and fruits like flowers of the Bush plum tree, Jungle berry bunches can be found all across the landscape.

- **Fauna:** Mammals like Leopard, Barking Deer, Jackal and Avifauna include Paradise flycatcher, Tree pie, Quails, Partridges, etc.

Visakhapatnam zoo gets new species from Warangal zoo as part of animal exchange programme

Indian Mouse Deer

- The Indian Mouse Deer or **Spotted Chevrotain** is the **smallest deer in India** and is highly **nocturnal**.
- **Scientific Name: Moschiola indica**
- **Distribution**:
  - It is **endemic to the Indian Subcontinent.**
  - It is mainly found in **peninsular India,** with **some old records from Nepal.**
  - **Sri Lanka has a separate species** called the spotted chevrotain (Moschiola meminna).
  - **Within India**, it is commonly encountered in a number of **forest areas along the Western Ghats**, in the **Eastern Ghats up to Orissa,** and in the **forests of central India.**
- **Features**:
  - It is small, 25-30 cm at shoulder height, and weighs from two to four kg.
  - The **fur colour** of the Indian spotted chevrotain **is dark brown with white underparts.**
  - There are four or five light **rows of white spots on the back**. **Males** of this species **have tusk-like upper canines**.
  - A unique feature of this group is that instead of a four-chambered stomach like in other ruminants, they have a three-chambered stomach.
  - It forages on the forest floor for **fruits, roots, leaves, and herbs.**
  - It has **occasionally been observed eating insects**, **crustaceans,** and even small mammals.
- **Conservation Status:**
  - **IUCN: Least Concern**

Chousingha:

- The four-horned antelope, or chousingha, is a **small antelope found in India and Nepal.**
- **Scientific Name: Tetracerus quadricornis**
- **Distribution**:
  - It is **endemic to the Indian subcontinent.**
  - They are found **in woodland areas throughout India.**
- **Features:**
  - They are the **smallest antelopes found in Asia.**
  - As the name suggests, Chousingha can be **identified by the four horns,** as against other bovids, which have two horns.
  - They are **usually diurnal and solitary** by nature; however, they can be spotted in loose groups of three to four.

- Animals are **sedentary**, **inhabiting more-or-less the same region** throughout their lives.
- They have a **yellowish-brown to reddish coat and are slender**, with small legs and a **short tail.**

- **Conservation Status:**
  - **IUCN Red List: Vulnerable**

Otoliths

Climate change has become a pressing concern affecting ecosystems worldwide, including marine habitats. Understanding how animals adapt to changing environmental conditions is crucial for assessing the impacts of climate change on marine biodiversity and ecosystem stability.

Otoliths as Environmental Indicators

- **Otolith Composition and Significance**:
- Otoliths, small calcified structures in fish ears, function akin to tree rings, preserving information about the fish''s age and environmental exposure.
- They serve as archives of a fish''s life, containing valuable chemical information related to environmental conditions during its lifespan.
- **Decoding Otolith Chemistry**:
- Recent advancements in scientific techniques enable the decoding of otolith chemical composition, revealing insights into metabolic activity, energy expenditure, and environmental influences experienced by fish.

Impact of Temperature on Metabolism

- **Temperature as a Vital Factor**:
- Temperature variations play a pivotal role in affecting metabolic rates and physiological functions in marine organisms.
- Rising temperatures due to climate change trigger alterations in metabolic processes, influencing energy allocation for vital functions.
- **Differential Responses in Animal Species**:
- Animals exhibit varied responses to temperature shifts based on their habitat and adaptation levels.
- Understanding these responses aids in predicting species vulnerability to changing climatic conditions.

Study on Atlantic Bluefin Tuna

- **Research Insights**:
- Recent research focusing on Atlantic bluefin tuna has utilized otolith analysis to decipher metabolic responses to temperature changes.
- Findings reveal that rising temperatures impact the metabolic rates of young bluefin tuna, particularly affecting their energy utilization.
- **Population Recovery and Vulnerability**:
- Differential recovery rates between Gulf of Mexico and Mediterranean tuna populations are observed.
- Increased temperatures in the Gulf of Mexico hinder the growth and recovery of young tuna due to surpassing optimal temperature thresholds.

Otoliths

- Also known as **ear stones or ear bones,** they are calcareous structures found in the inner ears of fish, reptiles, birds, and some mammals, including humans.
- These structures serve as sensory organs involved in balance, equilibrium, and hearing.
- Otolith rings refer to the growth rings present in these structures, which hold valuable information about the age, growth, and environmental history of the organism.

Structure and Function of Otoliths:

- **Composition:** Otoliths are composed mainly of calcium carbonate and a small amount of protein. They come in various shapes and sizes, depending on the species.
- **Sensory Function:** Otoliths play a crucial role in detecting movements and orientation. Tiny hair cells within the inner ear detect the movement of the otoliths, allowing organisms to perceive changes in position, acceleration, and gravitational forces.
- **Growth Rings:** Otoliths possess concentric rings, similar to tree rings, which form as a result of daily or seasonal growth patterns. These rings contain valuable information about the age and life history of the organism.

Importance of Otolith Rings:

- **Age Determination:** Counting the rings within otoliths is a common method used by scientists to estimate the age of fish and other species. Each ring typically represents a specific time period, allowing researchers to track the age of the organism.
- **Environmental Records:** Otolith rings can provide insights into the environmental conditions experienced by the organism. Factors such as temperature changes, water quality variations, and stress events can leave distinct marks or abnormalities in the rings, aiding in the study of past environments and climate changes.
- **Fisheries Management:** Understanding the age and growth patterns of fish species through otolith analysis is crucial for fisheries management. It helps in determining sustainable fishing practices, setting fishing quotas, and understanding population dynamics.

Techniques Used in Otolith Analysis:

- **Otolith Extraction:** Otoliths are typically removed from the inner ear of the organism, cleaned, and prepared for analysis.
- **Microscopy:** High-resolution microscopy techniques are used to examine the otolith rings and count the growth increments.
- **Isotopic and Elemental Analysis:** Scientists use various chemical analyses, including stable isotopes and elemental composition, to gather information about the environmental conditions during the otolith''s formation.
- **Computer Imaging and Modeling:** Advanced imaging techniques and computer modeling are employed to analyze and interpret otolith data accurately.

Applications of Otolith Research:

- **Fisheries Biology:** Otolith analysis helps in assessing fish stocks, understanding fish growth rates, and studying migration patterns, essential for sustainable fisheries management.

- **Ecological Studies:** Otoliths provide valuable data for studying the life history, movement patterns, and responses of organisms to environmental changes.
- **Paleoecological Research:** Otoliths retrieved from archaeological sites or sediment cores provide information about past ecosystems and environmental conditions.

The study of fish otoliths provides valuable insights into the impacts of climate change on marine life. Understanding metabolic responses and vulnerabilities of species like Atlantic bluefin tuna highlights the urgent need for adaptive conservation measures to safeguard marine biodiversity in a changing climate.

"Unabated" coal power

- According to a new deal struck at COP28 countries need to phase down "unabated" coal power.

'Unabated' fossil fuels

- When it comes to fossil fuels, "unabated" means **doing nothing to reduce the carbon dioxide (CO2) and other greenhouse gases that are released from the burning of coal, oil, and natural gas.**
- Conversely, "abated" refers to the **attempts to decrease the release of polluting substances to an acceptable level.**
- However, there isn't any clarity on what this level is and how to get there. Moreover, there is **no international or agreed-upon definition of the two phrases.**

IPCC on Abated Fossil Fuels

- The UN Intergovernmental Panel on Climate Change (IPCC) says unabated fossil fuels are ***those "without interventions that substantially reduce" greenhouse gas emissions.*** That would mean **capturing at least 90% of CO2 from power plants, or up to 80% of the methane** that leaks during energy production and transport, the report suggests.

CCS technologies

- Discussions around fossil fuel abatement largely revolve around CCS technologies — they capture emissions from power stations or industrial facilities and store them underground. But those discussions remain deeply polarised.
- While Oil and gas-producing companies and countries see carbon capture as a key component in plans to cut greenhouse gas emissions, climate activists and experts suggest that its role is limited.
- Recently, the European Union and 17 nations including Germany, France, Chile, New Zealand and climate-vulnerable island states, in a statement, said carbon capture technologies are no substitute for a drastic cut in fossil fuels and they shouldn't be overused.

How beneficial are carbon capture and storage technologies?

- In its report, Carbon Capture, Utilisation and Storage, the International Energy Agency (IEA) said **power and industrial plants that are equipped with modern CCS technologies capture around 90% of the CO2.**

- However, a 2022 study by the Institute for Energy Economics and Financial Analysis (IEEFA) found that most of the 13 flagship CCS projects worldwide that it analyzed **have either underperformed or failed entirely.**
- Another analysis by Climate Analytics, a Germany-based climate science and policy institute, revealed that **reliance on CCS could release an extra 86 billion tonnes of greenhouse gases into the atmosphere between 2020 and 2050.**
- If carbon capture rates only reach 50% rather than 95%, and upstream methane emissions are not reduced to low levels, this would pump 86 billion tonnes of GHG (greenhouse gases) into the atmosphere – equivalent to more than double the global CO2 emissions in 2023.
- Discussions around fossil fuels abatement are creating the false impression that **CCS would help limit average global temperature below 1.5 degree Celsius even when there is an expansion of fossil fuel projects.**
- However, scenarios that achieve the Paris Agreement's 1.5°C limit sustainably show a near complete phase-out of fossil fuels by around 2050 with only a tiny amount of fossil CCS," the analysis noted.
- CCS technologies are also **very expensive.** It's cheaper to shut down a coal plant and replace it with some combination of wind, solar and batteries in comparison to attaching a carbon capture device to the plant.

Moving Ahead

- According to the deal struck at COP28, countries need to phase down unabated coal power.
- Many climate-vulnerable nations and experts are concerned that this would allow countries and fossil fuel companies to continue to burn coal as long as they capture the emissions and store it underground.
- The false promises of 'abated' fossil fuels **risks** climate finance being funnelled to fossil projects, particularly oil and gas, and will greenwash the 'unabatable' emissions from their final use, which account for 90% of fossil oil and gas emissions.

Global Stocktake Adopted

The fifth (and probably final) iteration of the Global Stocktake (GST) text was released on December 13, 2023 and adopted with no objection at the closing plenary.

- The global stocktake is considered the central outcome of COP28 – as it contains every element that was under negotiation and can now be used by countries to develop stronger climate action plans due by 2025.

Highlights of the Global Stocktake

Fossil fuels

- Following concerns over the last draft which presented a list of actions on fossil fuels countries "could" take, the new iteration seems to have stronger language. It now calls on Parties to follow eight steps taking into account different pathways.
- The phase down of coal no longer includes a stop to new coal generation. An earlier point on **"reducing both consumption and production" of fossil fuels has been replaced with "transitioning away".**

- It must not come as a surprise that the language calling out production of fossil fuels is now missing. That is the trade off for taking away the ability for country Parties to approach actions as an optional menu.
- Right after the paragraph on fossil fuels, there is a mention of the role of transitional fuels to achieve the above. This references natural gas and was heavily stressed by Russia and Iran during the negotiations.
- One highlight was the addition of recognising the role of carbon capture storage solutions **"particularly in hard to abate sectors". Emphasised by the European Union, this specification is expected to prevent abatement technology from being used as an excuse to expand fossil fuel production.**
- Elsewhere in mitigation, the text has removed the time period of 1850-2019 when talking about the depletion of the carbon budget by historical emissions. It does still, however, explicitly mention the pre-2020 gaps of developed countries in achieving the recommended emissions reduction. This was specifically pushed for by developing countries including India, African Group of Negotiators (AGN) and Group of 77 and China and actively opposed by the United States, EU, Australia and Canada.
- There is a new mention recognising that emissions are projected to peak during 2020-2025 to limit warming to 1.5C. The paragraph also recognises that this peaking will take place in different timelines for countries depending on their national circumstances, thus accepting the different pathways language that many developing groups asked for.

NDCs

- The first line to notice is that the paragraph speaking to countries to come with their next Nationally Determined Contributions (NDC) first reaffirms the nationally determined nature of them. The text also recalls the mandate of the Paris Agreement to provide new NDCs every five years informed by the GST outcomes.
- Developing countries demanded that GST outcomes preserve the national sovereignty in enhancing NDCs. Whether a reaffirmation of the nationally determined nature of NDC will be enough remains to be seen.

There is acknowledgement that the successful achievement of NDCs in developing countries is subject to receiving adequate finance and other support. However, while earlier versions specifically highlighted that this must come from developed countries, there is no such accountability now.

Adaptation

- The adaptation section acknowledges the efforts of countries in developing climate adaptation plans, communications and actions. This recognition was an ask of many countries, particularly the developing. The text also acknowledges the existing gaps in resources for adequate planning in adaptation.
- A paragraph emphasises that adaptation action is critical in this decade and is subject to accelerated financial support.
- However, a stark change shows up in other mentions of adaptation finance. They have all been moved to the means of implementation section from the earlier adaptation section. This ask was specifically from developed countries like the

US and Australia. The developing countries had asked for adaptation finance to be part of the adaptation section.

Finance

- The finance section of means of implementation has language specifically acknowledging the obligation of developed countries in leading climate finance. In this new version, there is also wording that climate finance must represent "a progression beyond previous efforts", a point repeatedly emphasised by Global South groups like the AGN.
- There is a paragraph detailing the role of the private sector in bridging finance gaps. Another one highlights the need to scale up additional, grant-based, highly concessional finance to support the just transition in developing countries. However, there is no specification on who must provide this grant-based finance.
- There were requests by developed countries for the text to acknowledge their efforts in meeting the $100 billion a year goal and very likely having met it this year. The new text instead puts the figure at $89.6 billion in 2021 and a "likelihood" of meeting the goal in 2022.
- Subsequently, it notes the failure in meeting the $100 billion a year goal and encourages developed countries to strive to meet it through 2025 and beyond.
- On adaptation finance, the text calls for a report from developed countries on the doubling of adaptation finance from 2019-2025 next year, along with a call for a high-level ministerial dialogue to address the adaptation finance gap.
- The loss and damage fund has been acknowledged along with a call for developed countries to continue taking the lead to fund it, although only in the finance section and not in the loss and damage section.
- Article 2.1c has been recognised in its complementarity with Article 9 of the Paris Agreement. The former speaks to aligning international finance flows with low carbon development, while the latter recognises that developed countries must provide finance to developing countries to assist both mitigation and adaptation. This complementarity was demanded by many developing countries who feared just a focus on Article 2.1c could be misinterpreted.

Summing up

- The stocktake recognizes the science that indicates global greenhouse gas emissions need to be cut 43% by 2030, compared to 2019 levels, to limit global warming to 1.5°C. But it notes Parties are off track when it comes to meeting their Paris Agreement goals.
- The stocktake calls on Parties **to take actions towards achieving, at a global scale, a tripling of renewable energy capacity and doubling energy efficiency improvements by 2030.** The list also includes accelerating efforts towards the phase-down of unabated coal power, phasing out inefficient fossil fuel subsidies, and other measures that drive the transition away from fossil fuels in energy systems, in a just, orderly and equitable manner, with developed countries continuing to take the lead.
- In the short-term, Parties are encouraged to come forward with ambitious, economy-wide emission reduction targets, covering all greenhouse gases, sectors and categories and aligned with the 1.5°C limit in their next round of climate action plans (known as nationally determined contributions) by 2025.

Helping countries strengthen resilience to the effects of climate change

- The two-week-long conference got underway with the World Climate Action Summit, which brought together 154 Heads of States and Government. Parties reached a historic agreement on the operationalization of the loss and damage fund and funding arrangements – the first time a substantive decision was adopted on the first day of the conference. Commitments to the fund started coming in moments after the decision was gaveled, totaling more than USD 700 million to date.
- There was more progress on the loss and damage agenda with an agreement also reached that the UN Office for Disaster Risk Reduction and the UN Office for Project Services will host the secretariat of the Santiago Network for Loss and Damage. This platform will catalyze technical assistance to developing countries that are particularly vulnerable to the adverse effects of climate change.
- Parties agreed on targets for the Global Goal on Adaptation (GGA) and its framework, which identify where the world needs to get to in order to be resilient to the impacts of a changing climate and to assess countries' efforts. The GGA framework reflects a global consensus on adaptation targets and the need for finance, technology and capacity-building support to achieve them.

Increasing climate finance

- Climate finance took center stage at the conference, with Stiell repeatedly calling it the "great enabler of climate action."
- The Green Climate Fund (GCF) received a boost to its second replenishment with six countries pledging new funding at COP28 with total pledges now standing at a record USD 12.8 billion from 31 countries, with further contributions expected.
- Eight donor governments announced new commitments to the Least Developed Countries Fund and Special Climate Change Fund totaling more than USD 174 million to date, while new pledges, totaling nearly USD 188 million so far, were made to the Adaptation Fund at COP28.
- However as highlighted in the global stocktake, these financial pledges are far short of the trillions eventually needed to support developing countries with clean energy transitions, implementing their national climate plans and adaptation efforts.
- In order to deliver such funding, the global stocktake underscores the importance of reforming the multilateral financial architecture, and accelerating the ongoing establishment of new and innovative sources of finance.
- At COP28, discussions continued on setting a 'new collective quantified goal on climate finance' in 2024, taking into account the needs and priorities of developing countries. The new goal, which will start from a baseline of USD 100 billion per year, will be a building block for the design and subsequent implementation of national climate plans that need to be delivered by 2025.
- Looking ahead to the transitions to decarbonized economies and societies that lie ahead, there was agreement that the mitigation work programme, which was launched at COP27 last year, will continue until 2030, with at least two global dialogues held each year.

Event participation and inclusivity

- World leaders at COP28 were joined by civil society, business, Indigenous Peoples, youth, philanthropy, and international organizations in a spirit of shared determinationto close the gaps to 2030. Some 85,000 participants attended COP28 to share ideas, solutions, and build partnerships and coalitions.
- The decisions taken here today also reemphasize the critical importance of empowering all stakeholders to engage in climate action; in particular through the action plan on Action for Climate Empowerment and the Gender Action Plan.

Strengthening collaboration between governments and key stakeholders

- In parallel with the formal negotiations, the Global Climate Action space at COP28 provided a platform for governments, businesses and civil society to collaborate and showcase their real-world climate solutions.
- The High-Level Champions, under the Marrakech Partnership for Global Climate Action, launched their implementation roadmap of 2030 Climate Solutions. These are a set of solutions, with insights from a wide range of non-Party stakeholders on effective measures that need to be scaled up and replicated to halve global emissions, address adaptation gaps and increase resilience by 2030.
- The conference also saw several announcements to boost the resilience of food and public health systems, and to reduce emissions related to agriculture and methane.

Significance

- The negotiations on the 'enhanced transparency framework' at COP28 laid the ground for a new era of implementing the Paris Agreement.

Global Expert Review on Debt, Nature and Climate

At the 28th Conference of Parties to the United Nations Framework Convention on Climate Change (COP 28), leaders from Kenya, Colombia and France launched the **Global Expert Review on Debt, Nature and Climate.**

- Kenya, Colombia and France have teamed up and launched a team of international experts to review financial architecture.
- The experts will review debt, climate and nature.
- The review is a follow-through of part of the Paris Pact for People and Planet agreed at the Summit for a New Global Financing Pact in Paris.
- An international independent expert group will carry out the review, fitted with its own secretariat.

Rationale

- Over the past decade and a half, the debt crisis for the world's poorest nations has spiralled, often forcing them to step up extraction of their natural resources, which again accelerates nature and biodiversity loss and reduces their ability to sequester carbon.
- There is a need for financial institutions to be responsive to challenges facing the world and that everybody requires access to capital and financing to address the realities of climate change.

Mandate

- The three countries will aim to identify potential reforms to improve poor countries' ability to finance efforts to protect and restore nature as to mitigate, as well as adapt, to climate change.

- The expert review will examine necessary reforms, at the national and international levels, to ensure the debt sustainability of developing countries as they seek to increase investment to achieve a climate-resilient, low-carbon, and nature-positive structural economic transformation that also allows for greater economic and social development.

Methodology

- The global expert review will conduct a comprehensive assessment of how sovereign debt impacts the ability of developing countries to conserve nature, to adapt to climate change, to decarbonise their economies, and how it can become more sustainable, both fiscally and environmentally.

Analysis on Climate Funding

Closing the climate funding gap

- According to the Organisation for Economic Cooperation and Development (OECD), developing economies will need an annual **$2.4 trillion**(£1.9tn) of investment in climate action in the coming years. But wealthier nations have so far been **slow to deliver on financial pledges** to help poorer nations adapt to a hotter world. The new **"loss and damage" fund** announced at this year''s COP28 launched with $400m (£318m) from rich nations. But developing nations stand to lose 1,000 times that much each year to climate change, **by one estimate**.
- This money could fund projects that bolster natural defences, such as restoring mangroves to help protect against floods, or reforming agriculture to **improve food system resilience**.
- Yet many nations are also not in a position **to finance the above shifts**. Loans can help – and in 2020 **71% of public climate finance**was provided this way – but last year more than **50** developing countries were already in severe debt. Some nations are currently paying their creditors more than **12 times** what they spend on climate measures.
- Much of today''s economic vulnerability is also being caused by exogeneous shocks, not by poor macro management, explains Vera Swonge**,** co-chair of UN''s independent high level group on climate finance. From Covid-19 to the war in Ukraine, to climate disasters, recent global events have slowed economic growth and pushed up interest rates. The result is that many poorer nations'' debt burdens are skyrocketing, through no fault of their own. "We can''t fix the climate issue unless we fix the debt issue," as the **president of Kenya**recently summed it up.
- One way for indebted nations to respond to debt crises is by boosting exports of primary resources like **fuel**, forests or fish – but keeping these assets intact is now key to **capturing carbon**and **saving biodiversity**. Equally, debt can''t be fixed without climate action either, for when climate-linked disasters strike, economies are further strained. Twenty-eight of the most severely indebted nations are already **among the most climate-vulnerable**.
- Urgent debt relief is thus needed "to avert a deepening development crisis," the **UN Development Programme**(UNDP) has warned.

Indian Forest & Wood Certification Scheme

The Ministry of Environment, Forests and Climate Change has launched the Indian Forest & Wood Certification Scheme.

Voluntary Third-Party Certification

- This national forest certification scheme offers **voluntary third-party certification designed to promote sustainable forest management and agroforestry in the country**.
- The scheme includes **forest management certification, tree outside forest management certification, and chain of custody certification.**

Market Incentives

- The Indian Forest and Wood Certification **Scheme can provide market incentives to various entities that adhere to responsible forest management and agroforestry practices in their operations.**
- This includes state forest departments, individual farmers, or Farmer Producer Organizations engaged in agroforestry and farm forestry, as well as other wood-based industries in the value chain.

Basis of Certification

- The Forest Management certification is **based on the Indian Forest Management Standard**, consisting of 8 criteria, 69 indicators and 254 verifiers, which is an integral part of the National Working Plan Code 2023, launched earlier this year.
- A separate **Trees Outside Forests Standard**, is now introduced as a part of the newly launched Indian Forest & Wood Certification Scheme.

Advisory Body

- The **Indian Forest and Wood Certification Scheme**, will be overseen by the **Indian Forest and Wood Certification Council**, which will act as a multistakeholder advisory body.
- The Council is represented by members from eminent institutions such as Indian Council of Forestry Research and Education, Forest Survey of India, Quality Council of India, Indian Institute of Forest Management including representatives from the Ministries of Agriculture and Farmers' Welfare and Ministry of Commerce and Industry, State Forest Departments, Forest Development Corporations, and representatives from wood-based industries.

Scheme Operating Agency

- **Indian Institute of Forest Management, Bhopal** will act as the scheme operating agency and will be responsible for overall management of the Indian Forest and Wood Certification Scheme.

Accreditation

- The **National Accreditation Board for Certification Bodies under the Quality Council of India** will accredit the certification bodies which will carry out independent audits and assess adherence of various entities on the standards prescribed under the scheme.

Cinereous Vulture

- The ***cinereous vulture (Aegypius monachus)*** has been sighted at the Asola Bhatti Wildlife Sanctuary.

ASOLA BHATTI WILDLIFE SANCTUARY:

Cinereous Vulture

- The ***cinereous vulture (Aegypius monachus)*** belongs to the family Accipitridae.
- These cinereous vulture species are **distributed in Europe, Asia and Indian Subcontinent.**

Description

- The cinereous vulture is a large bird, measuring 100 to 110 cm in length and weighing 7,000 to 12,500 grams.
- The wingspan is 250 to 300 cm. The whole body is dark brown, except the head covered with brown down.
- The bare skin in the head and neck is bluish grey. The adult has brown eyes and a purplish cere.
- The bill is massive and is blue-gray in color. The legs are pale blue-gray.
- Their sounds and calls include grunts, croaks and hisses when feeding at carcasses.

Habitat

- The cinereous vultures inhabit hilly, mountainous areas, dry semi-open habitats such as meadows at high altitudes, steppe, grasslands and open woodlands.

Feeding habits

- These cinereous vulture species feed on carcasses of medium sized and large mammals.
- They may occasionally takes live prey. They soar high on the thermals to locate dead animals.

Breeding

- These cinereous vulture species breed during February and March. They breed in loose colonies in trees and cliff ledges.
- The nest is built with sticks and twigs. The egg clutch typically only a single egg.
- Both the parents take part in the rearing of the chick.

Distribution

- The cinereous vulture is distributed in France, Spain, Bulgaria, Greece, Turkey, Armenia, Azerbaijan, Georgia, Ukraine, Russia, Uzbekistan, Kazakhstan, Tajikistan, Turkmenistan, Kyrgyzstan, Saudi Arabia, Middle East, Iran, Afghanistan, north India, northern Pakistan, Nepal, Bhutan, Myanmar, Laos, Mongolia, China, North Korea and South Korea.

Movement Patterns

- The adult cinereous vulture populations in the Europe are mostly sedentary.
- The populations in temperate Asia migrate southwards for wintering.

Threats

- Shooting, poisoning, use of veterinary diclofenac (anti-inflammatory drug), decrease in food availability and habitat loss are the main threats in the conservation of these species.

Status and conservation

- The cinereous vulture global population is estimated to number 21,000 to 30,000 individual birds.
- There is slight increase in European population.
- There is decline in the Asian population.

- The **IUCN (International Union for Conservation of Nature) has categorized and evaluated these vulture species and has listed them as "Near Threatened".**

Shaukiyathal forest

- In an astonishing first, a tiger was spotted in the Shaukiyathal forest near Jageshwar Dham, Almora, in the Terai region of Uttarakhand.
- While tigers are occasionally spotted in the Mohan area of Almora, near Corbett Park, this is the first time they have been observed at an elevation of over 6,000 feet at Shaukiyathal, an area surrounded by dense forests of bamboo and rhododendrons near Jageshwar Dham.

Terai

- **Terai**, also known as **Tarai**, is a lowland belt of flat, **alluvial soil** that runs along the **Nepal-India** border and parallel to the lower Himalayan peaks.
- It runs from the **Yamuna River in the west** to the **Brahmaputra River in the east** and is characterized by undulating former wetlands.
- It is the northern continuation of India''s Gangetic Plain, beginning around 300 meters above sea level and rising to around 1,000 meters at the foot of **the Siwalik Range.**
- The Terai region of India includes the states of **Haryana, Uttarakhand, Uttar Pradesh, Bihar, and West Bengal.**
- It stretches roughly 800 km east to west and 30-40 kilometers north to south.
- The average elevation is less than 750 meters.
- **Gangetic alluvium**, consisting of strata of silt, clay, sand, pebbles, and gravel, formed the Terai flatland.
- Numerous springs generate multiple streams along its northern side, notably the major Ghaghara River (left-bank tributary of the Ganges River), which intersects the Tarai and contributes to its swampy aspect.
- **Corbett Tiger Reserve**, **Rajaji National Park**, **Dudhwa Tiger Reserve**, and **Valmiki Tiger Reserve** are among India''s most well-known tiger reserves and protected locations.
- There are 13 protected areas in all, nine in India and four in Nepal.
- Interspersed with the Tarai is the Bhabar, a region of coarse gravel and shingle deposits that support sal (Shorea robusta) woods.

News

- The sighting of a tiger has generated excitement among residents and wildlife experts.

- Wildlife officials are hailing this as a positive development in wildlife conservation.
- **Uttarakhand** currently has over **570 tigers** making it the **third-largest tiger population** in the country. **Corbett Park alone** has a population of about **270 tigers.**
- In the past few years, the number of tigers in the state has increased significantly.
- It is believed that **due to the high tiger density in the Terai area**, the **big cats are now turning to the mountains looking for new corridors.**
- The tiger is versatile in nature and can cope with almost every climatic condition, they can also live in places with exceptionally high temperatures such as the Ranthambore region of Rajasthan.
- The movement of tigers in the mountains is the result of climate change, the availability of food, and an increasing population of the big cats in Terai forests.
- in the last few years, the number of tigers in the state has increased.

COP28: What were the most important decisions?

- The COP28 climate meeting delivered some important outcomes — a first-time acknowledgment of the need to move away from fossil fuels, a first promise to reduce methane emissions, operationalization and capitalization of the loss and damage fund, and an agreement on a framework for the global goal of adaptation.
- However, like all previous COPs, it **remained an underachiever,** unable to measure up to the expectations, particularly in galvanizing more ambitious climate action in the immediate term.

The outcomes

Fossil fuel Phase-Out:

- This was the most hotly contested issue at COP28, and the reason for a prolonged deadlock.
- The role of fossil fuels in causing global warming had never been even acknowledged in any earlier COP decision, but this was getting increasingly untenable.
- After much deliberations, the final agreement called upon countries **to contribute towards "transitioning away" from fossil fuels, "so as to achieve net zero by 2050".**
- There were no time schedules and no targets. Some countries were extremely disappointed that the term "fossil fuel phase-out" had not been used.

- But even if it was, it would have a similar effect in the absence of any timeline.
- Production and consumption of fossil fuels are unlikely to be curbed significantly in the near term, but it is an important, rather unavoidable, measure in the 2050 timeframe.

Tripling of Renewable Energy:

- This was an expected outcome, and the only one that contributes to additional emission reductions between now and 2030.
- The COP28 agreement calls upon countries to contribute to tripling of global installed capacity of renewable energy, and doubling of annual improvements in energy efficiency.
- Together, these two measures have the potential to avoid emissions of about 7 billion tonnes of carbon dioxide equivalent between now and 2030, more than all the net result of all the other climate actions being currently taken.
- Tripling is a global target, and it is not incumbent on every country to individually triple its current installed capacity. It is thus not clear how this tripling would be ensured.

Phase-down of coal:

- Despite being a fossil fuel, just like oil or natural gas, coal has received a separate mention in the agreement. This is because coal was already singled out for phase-down in the Glasgow conference in 2021.
- There was a move to stipulate that no new coal fired power plants could be opened without an in-built carbon capture and storage facility, but this was strongly resisted by India, China, South Africa and other countries.
- It was dropped, and finally the Glasgow language was reiterated. There is nothing about how this phase-down is to be measured, or from what baseline.

Methane Emission Cuts:

- The agreement talks about "accelerating and substantially reducing non-cabon-dioxide emissions globally, including in particular methane emissions by 2030".
- Methane is the most widespread greenhouse gas apart from CO2, accounting for nearly 25 per cent of all emissions. It is also about 80 times more potent than CO2 in causing global warming.
- Methane emission reductions can therefore bring substantial benefits. But several countries, including India, are extremely opposed to any mandate to cut methane emissions, mainly because one of the major sources happens to be agriculture and livestock.

- Cutting methane emissions could involve tweaking agricultural patterns which could be extremely sensitive in a country like India.
- Possibly in deference to the concerns of such countries, the agreement does not mention any targets for methane emission cuts for the year 2030, although a group of about 100 countries had made a voluntary commitment, in Glasgow in 2021, to reduce their methane emissions by 30% by 2030.

Loss and Damage Fund:

- For the poor and vulnerable countries, this was the most important outcome.
- A decision to set up a Loss and Damage Fund had been taken last year in Sharm el-Shaikh but it had not been created, and no money had been promised.
- COP28 operationalised this fund on the opening day of the conference, and several countries, including hosts UAE, made funding commitments.
- By the end of the conference, commitments worth about US$ 800 million had been made. The money is meant to provide financial help to countries trying to recover from climate-induced disasters.

Global Goal on Adaptation:

- This was another important step developing countries had been waiting for. Historically, adaptation hasn't received enough attention, or resources, as compared with mitigation activities, mainly because adaptation is largely a local endeavor.
- Its benefits also are mostly local.
- But developing countries had been arguing that a global framework for adaptation was necessary to bring more attention to it.
- Accordingly, the Glasgow conference had decided to set up a two-year work programme to define the contours of this framework.
- The work program resulted in the identification of some common adaptation goals, important for the entire world.
- These included reduction in climate-induced water scarcity, attaining climate-resilience in food and agricultural production, supplies and distribution, and resilience against climate-induced health impacts.
- COP28 adopted the framework, but much more needs to be done on this front, particularly in identifying the indicators to measure progress on each of the global goals.
- The adaptation agreement currently lacks financial provisions, and countries would need to continue working on it to strengthen it in the coming years.

Aenigmachanna gollum

- ***Aenigmachanna gollum***, the Gollum snakehead, is a species of aquifer-dwelling dragon snakehead fish that is endemic to the Indian state of Kerala.
- ***Aenigmachanna gollum (Gollum snakehead)*** has an elongated, eel-like body colored mostly brown and beige.
- Its fins are long and transparent, with the dorsal fin stretching for about three-quarters of its body length, and the anal fin stretching for more than half its body length. Its pectoral fin is large, while the pelvic fin is absent.

Its tailfin is ovoid. Several large scales cover the top of the head. It has a Kazhuveli Wetlands

With the onset of the winter season, hundreds of migratory birds have started arriving at Kazhuveli Bird Sanctuary.

Kazhuveli Bird Sanctuary

- Kazhuveli Bird Sanctuary is **a protected area and bird sanctuary located in Villupuram district of Tamil Nadu.**
- After Pulicat lake, Kazhuveli, at 5,151.6 hectares, attracts many long-distance migrant birds from Central Asia and Siberia and is believed to be the second-largest brackish lake in southern India.
- Kazhuveli wetland is one of the 94 identified wetlands under the National Wetland Conservation and Management Programme launched by the Union government. The state has three other wetlands Point Calimere, Pallikaranai marsh, and Ousteri lake, under the same programme.
- There are approximately 226 species in Kazhuveli lake, and there are also winter migratory birds.
- An integral aspect of local and world ecology, wetlands retain rainwater, help with flood control, and serve as a drinking water source for humans.

- **reduced swim bladder.**
- Unlike many stygofauna – which usually have reduced coloring and have poor or no vision – ***gollum*** has well-developed pigmentation and normally-sized eyes.
- Due to its reduced swim bladder, ***gollum*** cannot remain buoyant in water.
- Like other snakehead fishes, it breathes air. It **moves by undulating its fins, like an eel.**

Distribution and habitat

- ***gollum*** is known only from its type locality, a paddy field in Oorakam, Kerala, in the biodiverse Western Ghats; one other occurrence was reported in a well 250 km south of the type locality.
- Its habitat in subterranean aquifers is threatened by about six million groundwater wells in the region, which lower the water table.

India is pushing for more renewable energy

India is pushing for more renewable energy like solar and wind, but it''s facing challenges with intermittency (generation only when it''s sunny or windy) and a lack of viable energy storage options.

- The final climate deal that was reached at COP 28 did not include a provision that would have required new coal-fired power plants to have carbon capture and storage technology.
- This was the result of strong opposition from India and some other countries, such as China and South Africa, who argued that such a requirement would limit their energy options and impose an unfair burden on developing nations.
- **The stance taken by India and other nations against the inclusion of mandatory Carbon capture and storage (CCS) for new coal plants** at COP28 reflects a multifaceted perspective on addressing climate change.

Reasons for Pushback

- **Cost and Viability:** Affordability remains a significant concern, especially for developing countries where resources might be constrained. The additional expenses related to implementing CCS could make coal plants economically unviable.
- **Technical Challenges:** The developmental stage of CCS technology, coupled with its inefficiencies and scalability issues, poses practical challenges in its widespread application.
- **Resource Allocation:** Prioritizing CCS might divert resources from developing more mature and economically feasible renewable energy technologies, potentially slowing down the transition to cleaner energy sources.
- **Developmental Needs:** Nations like India stress the requirement for reliable energy to support their economic growth. They perceive coal, with or without CCS, as a necessary bridge while investing in renewable alternatives.

Implications of Omission

- **Emissions Reduction Missed Opportunity:** The exclusion of CCS from the final deal limits the potential for capturing and storing substantial CO2 emissions from coal plants, affecting the overall ambition for emission reduction.
- **Continued Fossil Fuel Reliance:** The absence of immediate restrictions allows countries to proceed with new coal plant constructions, which might impede the global shift towards clean energy.
- **Pressure on Existing Plants:** The focus could shift to retrofitting existing coal plants with CCS, a complex and costly endeavour.

Possible Future Scenarios

- **Technological Progress:** Advancements in CCS technology might render it more economically viable and efficient, altering future considerations for international agreements.
- **Market Influences:** Increased pressure from stakeholders and rising fossil fuel costs might accelerate the transition towards renewable energy sources.
- **International Collaboration:** Collaborative efforts between developed and developing nations could drive the development and deployment of more affordable CCS technology, facilitating a more equitable global transition.

India's New Coal Thrust

- India''s recent decision to increase its coal-powered generation capacity, **aiming to add 80 gigawatts (GW) of coal power by 2031-32**, marks a substantial departure from India''s previous emphasis on renewable energy sources.
- The government argues that coal is essential for India's economic growth and energy security and that it will use advanced technologies to minimize the impact of coal burning.
- However, critics say that coal is a dirty and outdated source of energy and that India should invest more in renewable energy and energy efficiency. They also warn that coal mining will displace millions of people, destroy forests and wildlife habitats, and pollute water and air.

Key Policy change

- **Increased Coal Capacity:** The planned addition of 80 GW of coal power represents a substantial boost from current levels, suggesting a move away from the prior emphasis on renewable energy as the primary source of new capacity.
- **Policy Reversal:** This decision signifies a significant policy shift, steering away from the earlier focus on promoting renewables. It aligns with the government''s perceived need for reliable baseload power, an area where coal plants historically excel compared to solar or wind.
- **Baseload Power:** Coal plants are known for providing consistent baseload power, a factor crucial for a country experiencing rapid industrial and economic growth. This reliability is a primary driver behind India''s shift towards coal.
- **Additional Capacity:** On top of the 80 GW target, India aims to add another 60 GW of fresh coal capacity to the existing 27 GW under construction, further amplifying its coal-powered energy generation.

Reasons for the Shift

- **Energy Security Concerns:** Global energy price hikes and potential supply chain disruptions have heightened concerns about energy security. Coal, available domestically, offers a measure of stability in this volatile landscape.
- **Challenges with Renewables:** Integrating large-scale renewable energy into the grid necessitates substantial investments in storage and transmission infrastructure, which are still in the developmental stage. Coal power offers a quicker and more seamless integration into the existing grid.
- **Cost and Affordability:** Coal remains a cost-effective and easily accessible fuel source, especially for developing nations like India. This affordability makes it an attractive option for meeting immediate energy needs.
- **Industrial and Economic Growth:** India''s rapid economic growth fuels an increasing power demand. Coal''s capacity to quickly provide substantial baseload power supports this growth.

Potential Concerns

- **Environmental Impact:** Coal combustion is a significant contributor to greenhouse gas emissions and air pollution, exacerbating climate change and posing health risks for communities near coal plants.

- **Sustainability Concerns:** Reliance on coal could impede the progress and adoption of cleaner and more sustainable energy sources in the long term.
- **Public Health:** Air pollution stemming from coal plants can have severe health consequences for nearby communities, posing significant health risks.

Balancing the Needs

- **Investing in Clean Coal Technologies:** Adoption of technologies like carbon capture and storage can help mitigate the environmental impact of coal-powered plants.
- **Promoting Renewable Energy:** Continued investment in renewable sources like solar and wind remains crucial for achieving long-term sustainability goals.
- **Improving Energy Efficiency:** Reducing energy consumption across sectors can significantly decrease overall power demand, irrespective of the source

Problem with renewable

- India has made significant strides in renewable energy, becoming the **world"s third-largest producer with over 40% of its installed capacity coming from non-fossil fuels.** However, this green push has come with a challenge: intermittency.
- The intermittency challenge poses a significant obstacle to India"s ambitious renewable energy agenda. While the country has made commendable progress in becoming a global renewable energy leader, the reliance on weather-dependent sources like solar and wind has introduced a critical hurdle: unpredictability in power generation.

Understanding Intermittency

- **Renewable sources, such as solar and wind, generate electricity based on varying weather conditions**. This leads to fluctuating power outputs—high during optimal conditions and low during adverse weather. The resulting challenges include:
- **Mismatched Generation and Demand:** The irregular nature of renewable power can cause surges or drops in generation that don"t always align with the times of peak demand. This mismatch can strain grid stability.
- **Grid Instability:** The sudden shifts in power output can destabilize the grid, potentially causing disruptions in the electricity supply, and leading to outages or blackouts.

Impact on India"s Energy Landscape

- **Increased Costs:** To ensure grid stability despite renewable intermittency, utilities maintain standby thermal plants, incurring high fixed costs. This additional expense often makes renewable power seem more expensive than anticipated.
- **Discom Hesitancy:** State-owned distribution companies are hesitant to solely rely on renewables due to their unpredictability. This reluctance impedes a smooth transition to clean energy.
- **Necessity for Grid Modernization:** The current grid infrastructure isn"t optimized to efficiently handle the variability of renewable energy. Upgrading the grid becomes imperative to effectively integrate renewable sources.

Potential Solutions

- **Energy Storage:** Investments in large-scale energy storage systems, like battery storage, can capture surplus renewable energy during peak generation periods and release it when demand is high or generation is low, thereby stabilizing supply.
- **Demand-Side Management:** Encouraging consumers to adjust their energy consumption patterns, especially during peak and off-peak hours, can help align energy supply with demand more effectively.
- **Grid Modernization:** Upgrading the grid infrastructure with smart technologies and advanced forecasting systems can enhance grid flexibility and better manage the variability of renewable energy sources.

Storage Problem

- The recent decision to increase coal generation capacity reveals a stark reality: India''s ambitious renewable energy push is facing a critical roadblock – energy storage. While the rapid growth of solar and wind power is commendable, their dependence on weather makes them inherently variable, creating challenges for grid stability.

Storage Challenge

- **Renewable Variability:** Solar and wind power output fluctuates due to weather conditions. This unpredictability poses challenges, potentially disrupting grid stability, and causing blackouts as renewables occupy a larger share of the energy mix.
- **Storage Challenges:** Existing storage technologies, notably Lithium-ion batteries, are expensive and unsuitable for large-scale grid applications. Alternatives like hydrogen and hybrid models are promising but are still in developmental stages, lacking commercial viability.
- **Discom Constraints:** State-owned distribution companies encounter hurdles integrating variable renewables due to inflexible power purchase agreements (PPAs). This lack of adaptability stifles innovation in grid management.
- **Coal Dependency:** Policymakers foresee a temporary reliance on coal-fired plants for base load demand due to the absence of effective storage solutions. Constraints in expanding nuclear capacity further contribute to this reliance.
- **Cost Concerns:** The significant investment required for storage infrastructure is a major apprehension. Estimates suggest a substantial financial commitment, ranging from Rs 5-8 lakh crore solely for battery storage over the next decade, covering a fraction of daily usage.

Possible Solutions and Challenges

- **Developing Efficient Storage:** Investing in research and government support to explore cost-effective storage solutions like hydrogen and pumped storage is critical. Bringing down costs and enhancing efficiency is essential for scalability.
- **PPA Modernization:** Revisiting existing power purchase agreements with renewable developers to allow more flexibility is crucial. This adaptability would empower discoms to integrate variable energy sources effectively.
- **Grid Modernization:** Upgrading the grid with smart technologies and advanced forecasting systems improves resilience to renewable generation fluctuations, bolstering grid stability.

- **Balancing Short-term and Long-term Goals:** While short-term reliance on coal for base load may be necessary, the focus must remain on long-term decarbonization and transitioning to a renewable energy future.
- India''s shift towards increased coal capacity represents a multifaceted challenge with no easy solutions. While it may address immediate energy security concerns, it raises significant environmental and health issues. To secure a sustainable energy future, the government must balance immediate needs with long-term commitments to clean energy and environmental health through careful planning and implementation strategies.

Arctic Report Card

- Recently, the National Oceanic and Atmospheric Administration's (NOAA) annual Arctic Report Card was released.

Findings of the Report

- Rising temperatures in the Arctic have led to unprecedented wildfires that forced communities to evacuate, a decline in sea ice extent, devastating floods, food insecurity, and a rise in sea level.
- The 2023 summer was the warmest on record in the Arctic, which, due to climate change, has warmed nearly four times faster than the globe since 1979.
- Overall, **the past year was the sixth-warmest year the Arctic had experienced since reliable record-keeping began in 1900.**
- The rising temperatures in the northern polar region contributed to unprecedented wildfires that forced communities to evacuate, a decline in sea ice extent, devastating floods, food insecurity, and a rise in sea level, according to the study.

Consequences of the soaring temperatures in the Arctic

- Here is a look at the most severe consequences of the soaring temperatures in the Arctic.

THAWING OF SUBSEA PERMAFROST

- Subsea permafrost is essentially frozen soil beneath the seabed that contains organic matter. While it has been gradually thawing for thousands of years, (now) warmer ocean temperatures are accelerating this process, making it a cause of concern for scientists.
- "Just as with permafrost on land, when subsea permafrost thaws, the organic matter it contains decays and releases methane and carbon dioxide – greenhouse gases that contribute to global warming and worsen ocean acidification.

- To make matters worse, there isn't enough research to estimate how much greenhouse gases will subsea permafrost release in the following years and what will be its effect on global warming.

FOOD INSECURITY

- Due to the impact of climate change on freshwater bodies and marine ecosystems, Western Alaska recorded another year of extremely low numbers of Chinook and chum salmon — 81% and 92% below the 30-year mean, respectively. The size of adult salmon has also decreased, according to the report.
- It led to "fishery closures, worsened user conflicts, and had profound cultural and food security impacts in Indigenous communities that have been tied to salmon for millennia," it added.
- Interestingly, while the population of Chinook and chum salmon declined, sockeye salmon increased in number — 98% above the 30-year mean — in Western Alaska.
- The diverging impacts are affecting Indigenous communities that depend on the salmon for food, and challenging fishery managers as the different species respond in unique ways to the warming climate."

RAGING WILDFIRES

- Canada — 40% of its land mass is considered Arctic and Northern — was among the worst affected regions when it comes to wildfires.
- The country witnessed its worst wildfire season on record with fires burning more than 10 million acres in the Northwest Territories.
- This happened as high temperatures dried up vegetation and soil, coupled with below-average rainfall, creating perfect conditions for wildfires to burn more easily.
- "More than two-thirds of the territories' population of 46,000 people had to be evacuated at various points and smoke from the fires reached millions more people, reducing air quality as far as the southern United States," the news outlet added.
- Some areas were 7.2 degrees Fahrenheit or more above average (darkest red). (graph) Summer temperatures (July-September) each year from 1940-2023, showing rapid warming in recent decades.

SEVERE FLOODING

- Rising temperatures have led to dramatic thinning of the Mendenhall Glacier, located in Alaska, over the past 20 years, the NOAA report said. As a result, over the years, the meltaway water has annually caused floods in the region.

- One such disaster took place in August 2023, when "a glacial lake on a tributary of the Mendenhall Glacier burst through its ice dam and caused unprecedented flooding and severe property damage" in Alaska's Juneau, the study added.

GREENLAND ICE SHEET MELTING

- The NOAA report noted that the highest point on Greenland's ice sheet experienced melting for only the fifth time in the 34-year record.
- Not only this, the ice sheet continued to lose mass despite above-average winter snow accumulation — between August 2022 and September 2023, it lost roughly 350 trillion pounds of mass.
- Notably, Greenland's ice sheet melting is the second-largest contributor to sea-level rise.

Indian Tent Turtle

- Directorate of Revenue Intelligence (DRI), Zonal Unit, Lucknow, seized 436 baby Indian Tent turtles from a person illegally transporting them interstate.

Indian Tent Turtle

- The Indian tent turtle ***(Pangshura tentoria)*** is a species of turtle **in the family Geoemydidae.**
- The species is found in India, Nepal, and Bangladesh.
- tentoria is **found in Peninsular India, Nepal, and Bangladesh at elevations below 80 m.**

Habitat

- tentoria is primarily a riverine turtle that occurs in both small and large rivers.
- They bask on rocks and tree snags.
- Females are largely herbivores while males and juveniles are more carnivorous.

Conservation

- The Indian Tent Turtle is **a protected species under Schedule 1 of Wild Life (Protection) Act, 1972.**
- **IUCN:** Lower Risk/ least concern
- **IWPA:** Schedule I
- **CITES:** Appendix II

Blue "Dragon"

Japan has unearthed 72 million years old Blue "Dragon" that terrorized ancient seas.

- In a recent discovery, the extinct and apex predator mosasaur, a huge marine reptile from the Late Cretaceous period, fossil specimen was discovered in Japan.

- Around 72 million years ago, **this massive creature terrorized the Pacific waters.**
- In 2006, the remains were unearthed beside the Aridagawa River in Wakayama Prefecture.
- According to a study published in the Journal of Systematic Palaeontology, experts named the reptile after Japan''s Wakayama Prefecture, meaning ''Blue Dragon.''

Features of Blue Dragon

- This underwater predator possessed distinct features that made easy categorization challenging.
- According to experts, the animal featured a crocodile-like head and large paddle-shaped flippers.
- Its back flippers were larger than its front flippers.
- This predator possessed nearly binocular vision, making it a deadly hunter.
- More than five feet long, this aquatic creature also featured a dorsal fin similar to the great white shark.
- The large front fins might have helped with rapid maneuvering, while its large rear fins might have provided pitch to dive or surface.
- The blue dragon''s **tail produced intense and rapid acceleration while hunting fish and was used for propulsion.**

Binsar Wildlife Sanctuary

- In a remarkable discovery, a tiger was spotted for the first time at Binsar Wildlife Sanctuary.

Binsar Wildlife Sanctuary

- Binsar Wildlife Sanctuary is located in the foothills of Himalayas in Almora district of Uttarakhand.
- The **peak point known as Jhandi Dhar** is at an elevation of 2412 meters.
- Apart from protecting wildlife, the sanctuary was established with an aim to conserve the broad leaf oak forests, mainly located in the Central Himalayan region.
- Binsar was the summer capital of the Chand Kings, who ruled Kumaon from the 11th to 18th centuries.
- The sanctuary has been **declared an Important Bird Area by Bird Life International** as there are more than 200 species of birds in the sanctuary,

including Fork tail, Blackbirds, Laughing Thrush, Pheasant, Nuthatches, Parakeets and Monal.

European Bison

The ongoing war in Ukraine could affect the efforts to save European Bison.

European Wood Bison

- The European Wood Bison, also known as the wisent is a European species of bison.
- It is one of two extant species of bison, alongside the American bison.
- The European bison is the **heaviest wild land animal in Europe**, and individuals in the past may have been even larger than their modern-day descendants.
- During late antiquity and the Middle Ages, bison became extinct in much of Europe and Asia, surviving into the 20th century only in northern-central Europe and the northern Caucasus Mountains. During the early years of the 20th century, bison were hunted to extinction in the wild.
- The species – now numbering several thousand and returned to the wild by captive breeding programmes – is no longer in immediate danger of extinction, but remains **absent from most of its historical range**.
- The European bison is one of the **national animals of Poland and Belarus.**
- The European bison (***Bison bonasus***), Europe''s largest land mammal, has moved from Vulnerable to Near Threatened due to continued conservation efforts.

Udanti Sitanadi Tiger Reserve

Despite millions spent on conservation efforts, only one purebred wild buffalo, the state animal of Chhattisgarh, remains within the boundaries of **Udanti Sitanadi Tiger Reserve in the Gariaband district of the state.**

- Sitanadi Wildlife Sanctuary is **located in Dhamtari District, Chhattisgarh.**
- The wildlife sanctuary was **established in 1974 under Wildlife Protection Act of 1972.**
- It is **named after Sitanadi River which originates from this sanctuary and joins Mahanadi River near Deokhut.**
- Teak and bamboo predominate among the vegetation. Animals include Tigers, Leopards, Flying Squirrels, Jackals, Four-horned Antelopes, Chinkara, Black Buck, Jungle Cat, Barking Deer, Porcupine, Monkey, Bison, Striped Hyena, Sloth Bear, Wild Dogs, Chital, Sambar, Nilgai , Gaur, Muntjac, Wild Boar, Cobra, Python among many others.

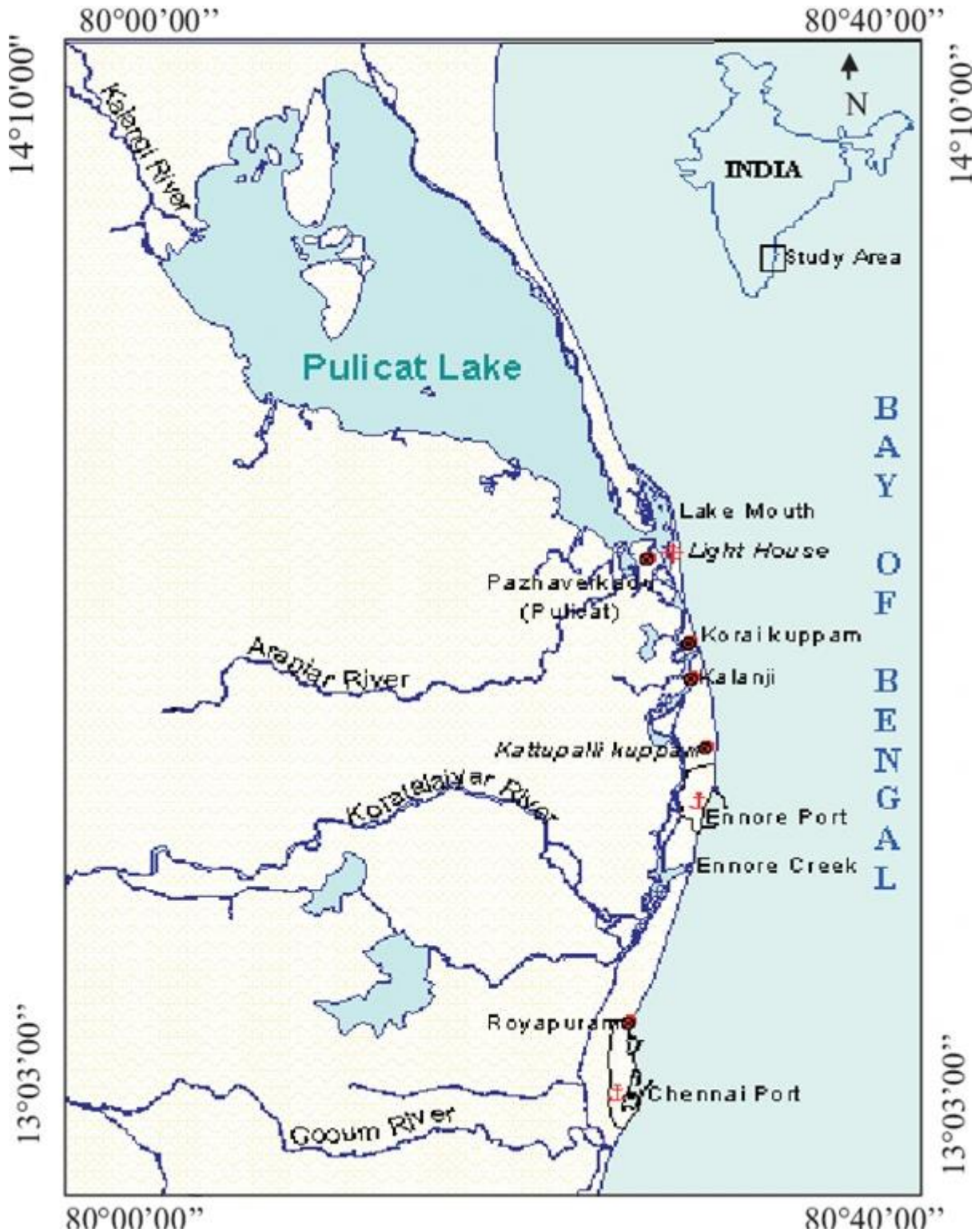
Chum salmon

Chum salmon, a species of anadromous salmonid fish, have found a new location to spawn—the Arctic waters, and the scientists are alarmed.

- The chum salmon (***Oncorhynchus keta***), also known as dog salmon or keta salmon, is a species **of anadromous salmonid fish from the genus Oncorhynchus** (Pacific salmon)
- It is native to the coastal rivers of the North Pacific and the Beringian Arctic, and is often marketed under the trade name silverbrite salmon in North America.
- The term "Dog Salmon" is most commonly used in Alaska and refers to the Salmon whose flesh Alaskans use to feed their dogs.
- They are **found throughout the North Pacific Ocean and range from the Arctic coast of Canada and throughout the northern coastal regions of North America and Asia.**
- Chum Salmon are **listed as threatened under the Endangered Species Act.**

Ennore oil leak

- During the recent Cyclone Michaung, an oil spill occurred from the Chennai Petroleum Corporation Limited (CPCL) into the Buckingham Canal and Ennore Creek in Tamil Nadu.
- The wetland has suffered from pollution caused by industries and neglect, as evidenced by the continuous presence of fly ash and hot water. Despite NGT directives, little progress has been made in restoring and protecting the fragile ecosystem of the Ennore wetlands.
- Ennore Creek in Chennai, situated along the Coromandel Coast, serves as a crucial buffer for the aquifers of the Araniyar-Kosasthalaiyar Basin, protecting them from the sea. Positioned in the floodplains of three rivers on a disaster-prone coastline, Chennai relies on wetlands like Ennore Creek as natural shock absorbers during calamities.



- **Tar balls** and thick layers of oil have been deposited along the coastline. A trail of oil deposits can also be seen on the shores and the fishing boats.

- Tarball is a dark-coloured piece of oil.
- **Suo Moto Case by NGT:** The **National Green Tribunal(NGT)** took up the case suo moto demanded comprehensive reports from the Tamil Nadu Pollution Control Board (TNPCB) and Chennai Petroleum Corporation Limited (CPCL) regarding oil spillage.
- **It directed the state to compensate for the loss of livelihood.**

National Oil Spill-Disaster Contingency Plan (NOS-DCP)

- **Aim:** It outlines the steps required for the management of responses to marine oil spills in India.
- **Nodal Ministry:** The NOS-DCP comes under the purview of the **National Disaster Management Authority, Ministry of Home Affairs.**
- **Implementing Agency:** The **Indian Coast Guard(ICG)** is responsible for **maintaining and implementing the NOS-DCP.**
- ICG acts as the Central Coordinating Agency for combating oil pollution in various maritime zones, except in the waters of ports and within 500m of offshore platforms, refineries, and associated facilities.

Impacts of Oil Spillage

- **Health Impact:** Residents in affected localities face unbearable odour, leading to respiratory issues among vulnerable groups like women, children, and the elderly, along with **physical symptoms such as eye irritation, dizziness, and skin itching.**
- **Impact on Livelihoods:** It damaged fishing boats and equipment, severely impacting the livelihoods of the fishing community.
- **Impact on Aquatic Life:** Oil spill obstructs the passage of sunlight into the sea, thereby destroying the photosynthesizing phytoplankton and, as a result, other organisms such as fishes, water-dependent mangroves, and sea birds.
    - The fish can become tainted as the oil will get absorbed by their skin.

- **Rich Diversity of Birds:** Many birds, including **migratory and near-threatened birds** such as the **Spot-billed Pelican, Whiskered Tern, and Painted Stork,** are present here.
    - Feathers from birds are waterproof because of the cuticle layer covering them. Oil and other hydrophobic chemicals dissolve that cuticle layer. As a result, a **cormorant (a medium- to large-sized bird)** that comes into touch with oil drowns when it goes into water again.

Clean Up Oil Spills

- **Bioremediation:** It uses bacteria to clean up oil spills in the ocean through bioremediation.
- **Spill Containment methods:** It includes oil boomers, skimmers and gully suckers, etc to remove the floating oil, which will be safely disposed of at the designated location for storing hazardous wastes.
- **Oil Spill Dispersants (OSD):** They are sprayed over the affected area.

Oil Zapper:

- An **oil zapper** is used to **remove the oil** by using a **bio-remediation method**. Oilzapping is a method for **cleaning up significant oil spills from a surface.** This method **involves releasing bacteria** that **consume hydrocarbon compounds** found in **waste hydrocarbon and crude oil.**
- It is a **patented light brown powder** made of **four different bacteria** to **break down these hydrocarbons.** The powder may be **applied to both land and water.**

Uses of Oilzapper:

- Five distinct bacterial strains are immobilized and then released onto the **oil spill in an oil zapper** along with a carrier substance. **An oil zapper can be used for the following purposes:**
    - To clear up shorelines after major oil spills.
    - To clear out the hydrocarbon waste generated by oil refineries.
    - To reduce the impact of harmful oil spills on the environment by converting the harmful compounds into simple carbon dioxide and water.

Ennore Creek:

- It is a **backwater** located in **Ennore, Chennai** along the **Coromandel Coast** of the **Bay of Bengal.**
- It is located in the zone comprising lagoons with salt marshes and backwaters, submerged under water during high tide and forming an arm of the sea with the opening to the Bay of Bengal at the creek.
- Once a flourishing **mangrove swamp,** the creek has been **degraded to patches in the fringes** mainly due to **human activities** in the region.
- The depth of the creek varies from **1 to 2 m** and is **shallow** near the mouth.
- The north–south trending channels of the creek connect it with the **Pulicat Lake** to the north and to the distributaries of the **Kosasthalaiyar River** in the south.

Kosasthalaiyar river:

- It **originates** near **Pallipattu** in **Thiruvallur district** and drains into the **Bay of Bengal.**
- Its **northern tributaryNagari River** originates in the **Chitoor district of Andhra Pradesh** and joins the **main river** in the **backwaters of Poondi reservoir**.
- Its catchment area is spread over **Vellore, Chitoor, North Arcot, Thiruvallur** and **Chennai districts**.
- It branches near **Kesavaram Anicut** and this tributary flows to the Chennai city as **Coum River,** while the main river flows to the **Poondi reservoir.**
- From **Poondi reservoir** it joins the sea at **Ennore Creek**.

Kamaraj Port in Ennore:

- Earlier known as the **Ennore Port,** is the **12th major port of India.**
- It is located on the **Coromandel Coast** about 24 km north of **Chennai, Tamil Nadu.**
- It is the **only corporatized major port in India** and is registered as a company.
- The port was declared as a major port under the Indian Ports Act, 1908 in March 1999.

Dhangars to revive demand for reservation as tribals

The Dhangar community's demand for ST status has been dismissed.

- **Dhangars** – They are large cluster of **pastoral groups** and they live mostly in Western Maharashtra and Marathwada.
- **Population** – In Maharashtra, they are estimated to range from **4 to 12% of the total** population (unofficially estimate).
- **Reservation status** – In Maharashtra, there is an exclusive quota of 3.5% under a separate category called NT (No Tribe).
- In central list, they are recognised as Other Backward Classes (OBC) community.
- **Demand for ST status –** It started in 1955, when there was no reservation for them either in the state or at the Centre.
- **Reason for demand –** Better constitutional safeguards to SC and ST than to OBCs.

Article 340 directs the President to constitute a commission to identify backward communities and make recommendations for their upliftment.

Process of inclusion under ST list

· This process follows a set of modalities established in 1999.

· The respective state or union territory shall send the initial proposal for ST status.

· It is forwarded to Union Tribal Affairs Ministry and subsequently sent to the Office of the Registrar General of India (ORGI).
· If the ORGI approves the inclusion, the proposal is then sent to the National Commission for Scheduled Tribes (NCST).
· If the NCST concur, the proposal is forwarded to the Cabinet for amendment to the Constitution (Scheduled Tribes) Order, 1950.

- Discretion of executive government in implementing welfare activities for OBC
  - The 1st BC commission's (Kaka Kelkar) report came in 1955, whose recommendations were never implemented.
  - The 2nd BC Commission's (Mandal) report came in 1980 whose recommendations were implemented partially only in 1990.

Historical - Dhangar

- **Economic activity** – British identified 23 subgroups of the Dhangars, many specialising in livestock activities.
- While mostly settled as agriculturalist, some within the cluster were nomadic.
  - The Dange Dhangars herd buffaloes in high-rainfall forest tracts of the Western Ghats.
- **Social status** – British recognised them as a tribe for their nomadic nature and lower status in Maharashtra.
- However, few were privileged and even have royal antecedents.
  - Ahilyabai Holkar, the queen who reigned the Malwa region in the 18th century was a Dhangar.

Outcomes of COP 28

- **The 28th Session**of the **UN Climate Change Conference (COP 28)** was held in **Dubai, United Arab Emirates.**

The Major Outcome from COP 28

- **Loss and Damage (L&D) Fund:**It was created during COP 27, it was made operational in COP28.
  - COP 28 approved the **Governing instrument**of the Loss and Damage Fund and decided that the Fund will be serviced by a **new, dedicated and independent secretariat.**
  - However, a meagre $790 million has been pledged so far, by a few nations, despite the corpus requiring $100 billion to more than $400 billion a year.
  - Notably, the U.S., the largest historical emitter, committed only $17.5 million.
- **Ambitious Emissions Reduction Targets:**The first global stocktake (GST) concluded. GST enables countries and other stakeholders to see their progress towards meeting the goals of the Paris Agreement.
  - Countries' decision at COP28 to transition away from fossil fuels was coupled with an ambition to **triple renewable energy capacity by 2030.**
  - More than 20 countries also pledged to**triple their nuclear energy capacity.**
- **Global green-finance Mechanisms:** The COP28 witnessed the establishment of innovative global green-finance mechanisms to support developing nations in their transition to sustainable practices.
  - The Green Climate Fund received fresh support of $3.5 billion, allowing it to finance adaptation and mitigation projects in vulnerable regions.
  - The COP28 Presidency also introduced**ALTÉRRA,** an investment initiative with an ambitious goal to globally mobilise an unprecedented sum of **$250 billion by 2030.**
- **Climate and Health Declaration:** The**A.E.**declaration on climate and health came into being at COP28 through a partnership of the COP28 Presidency with the **World Health Organisation.**
  - It recognises the growing health impacts of climate change including a reduction in air pollution and lowering the cost of healthcare.
  - The declaration, signed by **123 countries,**has collectively committed **$1 billion** to address the growing climate-health crisis.
  - **India didn't sign this declaration**as India's healthcare infrastructure is still growing to meet demand, such a commitment could compromise the healthcare requirements of a growing population.
- **The Global Methane Pledge:**It was launched at COP26 and received renewed attention at COP28, with the Climate and Clean Air Coalition becoming the new secretariat.

- It announced more than $1 billion in new grants for funding projects to reduce methane emissions from the agriculture, waste, and gas sectors.
- **More than 150 countries**signed the pledge to reduce methane pollution.
- **India isn't a signatory**to this pledge because **it shifts focus from carbon dioxide to methane,** a GHG with a lower lifetime.
- Methane emissions in India are also primarily from rice cultivation and enteric fermentation (livestock rearing), which support the livelihoods of small and marginal farmers.

Issues that Saw Difference of Opinions

- **Fossil-fuel Subsidies:** While developed countries advocated for phasing them out, developing countries, including India, refused over a phase-out's implications on economic growth and development.
- **Common and Differentiated Responsibilities:**The historical responsibility of developed countries for GHG emissions, developing countries argued to increase the flow of climate finance and technologies to facilitate just job transitions and inclusive development.
- **Some other contentious issues**spanned the market mechanisms, financial resource allocation, the role of the World Bank as the agency for managing the L&D fund, and private sector engagement in climate action.

UN Climate Change Conference

– The United Nations Climate Change Conferences, often referred to as COP (Conference of the Parties), are international gatherings where countries come together to discuss and negotiate global efforts to address climate change.
– These conferences are organized under **the United Nations Framework Convention on Climate Change (UNFCCC),** an international treaty came into force in **1994** with the objective of stabilizing greenhouse gas concentrations in the atmosphere.
– The COP meetings are held **annually**, and each conference is numbered sequentially.
– The conferences provide a platform for countries to assess progress in dealing with climate change, negotiate agreements, and make decisions on a

wide range of issues related to climate action.

India"s ethanol conundrum

- While **ethanol blended petrol (EBP)** increased from **1.6%** in **2013-14** to **11.8%** in **2022-23,** the **20%** target by **2025** has run into trouble with low sugar stocks in **2022-23** and impending shortfall in sugarcane production this year.
- **NAFED** and **National Cooperatives Consumers' Federation of India (NCCF)** have authorised to procure **maize (corn)** for supplying **ethanol distilleries**.

Ethanol from maize (corn):

- Only **5-7%** of the **world's corn output** was used for **ethanol production** and **the U.S.** has a **corn based ethanol programme**.
- **Challenge:** Using corn for producing ethanol directly reduces its use as food or livestock feed. It directly links food prices to cruid oil prices through the demand side.
    - High corn prices also increases the price of other soft grains like wheat/barley.

Ethanol from sugarcane:

- **Sugarcane based ethanol production** is preferred in **tropical countries** like **Brazil** and **India.**
    - **Challenge:** More land under **water-intensive sugarcane** production can **displace food production** and also **degrade water table**.
- In case of **sugarcane,** ethanol is produced by processing the **molasses (C-heavy/B-heavy)** and **constitutes minimal trade-off** with **sugar output**.
- The **B-heavy molasses** path produces **less sugar** and **ethanol** simultaneously from sugarcane.
- **Ethanol** can also be produced from **cane juicewithout the extraction of sugar,** but it may lead to conflict between **sugar production** and **ethenol production**. This process gives substantially higher yield of ethanol.

Sugarcane molasses:

- It is a **viscous, dark** and **sugar-rich by-product of sugar extraction** from the **sugarcane (Saccharum officinarum L.).** It is a **major feed ingredient,** used as an **energy source** and as a **binder in compound feeds**.
- Both the **sugar extraction process** and the **sugar refining process** yield molasses, and each step of these processes output **specific types of molasses:**
    - **Integral high-test molasses** is produced from **unclarified sugarcane juice.** Because it is **concentrated** from unclarified sugarcane juice, heavy incrustations and scum deposits lead to frequent mill interruptions and, therefore, to increased factory maintenance costs.
    - **A molasses (first molasses)** is an **intermediate by-product** resulting from **first sugar crystal extraction (A sugar),** from initial processing at the sugar factory. A molasses contains **80-85% DM.** If it has to be stored, it should be inverted in order to prevent crystallization.

- **B molasses (second molasses):** It has approximately the **same DM content** as **A molasses** but contains **less sugar** and **does not spontaneously crystallize.**
- **C molasses (final molasses, blackstrap molasses, treacle)** is the **end by-product** of the processing in the sugar factory. It still contains considerable amounts of **sucrose** (approximately 32 to 42%). **C molasses does not crystallize** and can be found in **liquid or dried form** as a **commercial feed ingredient.**
- **Syrup-off (liquor-off, jett)** is the **end by-product** from the **centrifugation** of the final refined masecuite in a raw sugar refinery. Normally, **syrup-off** is sent to the raw sugar section of the refinery where it is further processed in order to recover more sucrose. Due to its **high content of sucrose (90-92% DM),** it is an **excellent energy source** for **monogastrics** but can be an expensive ingredient.
- **Refinery final molasses** is the **by-product** of **refined sugar extraction.** It has a very similar composition to that of **C molasses** produced in a raw sugar factory and it is stored in the same tanks.
- In some countries the juice is extracted in a simple animal or mechanically driven press, then boiled in open vats. In this rudimentary process, **pan (uncrystallized) sugar** is produced and the **by-product molasses** is called **"melote".** It contains only **50% DM.**

Greenwashing

- Recently, the United Kingdom (UK) banned Air France, Lufthansa, and Etihad ads over 'greenwashing' claims.
- It is the process of conveying a false impression or providing misleading information about how a company's products are more environmentally sound.
- It is considered an unsubstantiated claim to deceive consumers into believing that a company's products are environmentally friendly.
- For example, companies involved in greenwashing behaviour might make a claim that their products are from recycled materials or have energy-saving benefits.
    - Although some of the environmental claims might be partly true, companies engaged in greenwashing typically exaggerate their claims or the benefits in an attempt to mislead consumers.

Additional Information (Aviation industry and emissions)

– According to the UN Intergovernmental Panel on Climate Change's (IPCC) 2022 estimates, the aviation industry is responsible for

approximately 2.5% of all human-produced CO2 emissions.
– It may seem like a modest contribution to the overall emissions, but it is set to grow at a very fast pace.
– The IPPC has said that aviation's contribution could increase to 5% of the total contribution by 2050 if measures are not taken to address these emissions.

Uttar Pradesh"s Katarniaghat Wildlife Sanctuary

- Location: It is a protected area in the Upper Gangetic plain in Uttar Pradesh and covers an area of 400.6 km2 in the Terai of the Bahraich district.
- In 1987, it was brought under the purview of the 'Project Tiger', and together with the Kishanpur Wildlife Sanctuary and the Dudhwa National Park, it forms the Dudhwa Tiger Reserve.
- It provides strategic connectivity between the tiger habitats of Dudhwa and Kishanpur in India and the Bardia National Park in Nepal.
- Vegetation: Its fragile Terai ecosystem comprises a mosaic of sal and teak forests, lush grasslands, and numerous swamps, and wetlands.
- Flora: It is predominantly Sal Forestwith its associate tree species like Terminalia alata (Asna), Lagerstroemia parviflora (Asidha), Adina cordifonia (Haldu), Mitragyna parpiflora (Faldu), Gamelina arborea (Gahmhar), etc.
- Fauna: It is home to a number of endangered species, including the Gharial, tiger, rhino, swamp deer, hispid hare, Bengal florican, and white-backed and long-billed vultures.
- The Gairwa River, which flows in the KWS area, is declared a sanctuary for Mugger and Gharial. It is also home to rare turtles, freshwater fish, and a host of aquatic life.
- It is among the few places in India where freshwater dolphins, also known as Gangetic dolphins, are found in their natural habitat.

National Transit Pass System (NTPS)-'One Nation-One Pass' to facilitate the seamless transit of timber, bamboo, and other forest produce across the country.

- The Union Minister for Environment, Forest and Climate Change launched the National Transit Pass System (NTPS) pan-India.

- National Transit Pass System is to facilitate the seamless transit of timber, bamboo, and other forest produce across the country.
- Currently, the transit permits are issued for transport of timber and forest produce based on state specific transit rules.
- The NTPS is envisioned as a "One Nation-One Pass" regime, which will enable seamless transit across the country.
- This initiative will streamline the issuance of timber transit permits by providing a unified, online mode for tree growers and farmers involved in agroforestry across the country, contributing to the ease of doing business.
- It offers seamless transit permits, managing records for both inter-state and intra-state transportation of timber, bamboo and other forest produce obtained from various sources like private lands, government owned forest and private depots.
- The QR coded transit permits generated under NTPS will allow check gates across various states to verify the validity of the permits and allow seamless transit.
- It is designed for user convenience, featuring desktop and mobile applications for easy registration and permit applications.
- Transit permits will be issued for tree species which are regulated, while the users can self-generate No Objection Certificates for exempted species.
- Presently, 25 States and Union Territories have embraced the unified permit system, streamlining interstate business operations for producers, farmers, and transporters.
- Nodal Ministry: Ministry of Environment, Forest and Climate Change

T.N. Forest Department to investigate private helicopter's unauthorised flyby over Mukurthi National Park.

- Mukurthi National Park is located in the western corner of Nilgiris Plateau in the state of Tamil Nadu and is a part of the Nilgiri Biosphere Reserve.
- It is sandwiched between Mudumalai National Park and the Silent Valley National Park.
- It was established with the prime motive of conserving its keystone species – the Nilgiri Tahr.
- It is a UNESCO World Heritage Siteand was formerly known as Nilgiri Tahr National Park.
- It is also home to Mukurthi Peak (2,554m), the fourth highest peak in the Nilgiri Hills.

- Rivers:Pykara and Kundah rivers flow through the park along with several perennial streams that originate in the park and drain into the Bhavani Puzha.
- Vegetation: The majority of the landscape in the reserve is covered with shrubs and mountainous grasslands.
- The areas which are at an elevation and experience high rainfall are covered with sholas and lush green tropical grasslands.
- Flora: Sholas, Gaultheria fragrantissima, Helichrysum and Berberis tinctoria, Rhododendrons, Cinnamon, Mahonia, Satyrium, Raspberries etc.
- Fauna: Nilgiri tahr, Indian elephants, Nilgiri Langur, Bengal tiger and bonnet macaque etc.

Meghalaya"s Lakadong turmeric gets Geographical Indication tag

Lakadong turmeric

- It is considered to be one of the **world"s best varieties of turmeric**, with a **curcumin content** of around 6.8 to 7.5 per cent.
- It is darker in colour and is grown **organically without the use of fertilisers.**
- It is found in Lakadong **area of Jaintia Hills,** has **high curcumin content.**
- **Other GI products from Meghalaya: Garo Dakmanda** (traditional dress), **Larnai pottery and Garo Chubitchi** (alcoholic beverage) were also awarded the GI tag,

Curcumin

- It is a **polyphenol** which has been shown to target multiple signalling molecules while also demonstrating activity at the cellular level.
- It has been **shown to benefit inflammatory conditions**, metabolic syndrome, pain, and to help in the management of inflammatory and degenerative eye conditions.
- In addition, it has been shown to benefit the kidneys.
- Most of these benefits are due to its **antioxidant and anti-inflammatory effects**.

Geographical Indication (GI) tag

- It is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.
- This is typically used for agricultural products, foodstuffs, wine and spirit drinks, handicrafts and industrial products.
- The Geographical Indications of Goods (Registration and Protection) Act, 1999 seeks to provide for the registration and better protection of geographical indications relating to goods in India.
- This GI tag is valid for **10 years** following which it can be renewed.

Indonesia"s Marapi Volcano Erupts, Blankets Nearby Villages With Ash

Mount Marapi

- **Not to be mistaken with Mount Merapi in Java,** this **Mount Marapi** is located in West Sumatra.
- Its name means **Mountain of Fire.** With over **60 eruptions to its credit since the late 18th century,** Marapi claims the title of the most active volcano in Sumatra.

Pacific Ring of Fire

- It also known as the Circum-Pacific Belt,**is a path along the Pacific Ocean characterised by active volcanoes and frequent earthquakes.
- Its length is approximately 40,000 kilometres (24,900 miles).
- It traces boundaries between several tectonic plates—including the **Pacific, Juan de Fuca, Cocos, Indian-Australian, Nazca, North American, and Philippine Plates.**

Paleoseismic investigations through earthquake induced liquefaction features can trace earthquake history & prepare for future

Kopili fault zone

- It is a 300 km long and 50 km wide lineament situated **in the northeastern region** (NER) of India.
- It extends from the **western part of Manipur** to the **tri-junction of Bhutan, Arunachal Pradesh, and Assam.**
- It is closer to **Himalayan Frontal Thrust.**
- This is a seismically active area falling in the **highest Seismic Hazard Zone V.**
- It is associated with collisional tectonics because of the Indian Plate subducting beneath the Eurasian Plate.
- The fault itself is a transpressional fracture that generates lower crustal dextral strike-slip earthquakes.
- A tectonic depression filled up by the alluvium of the Kopili river and its tributaries, the Kopili fault zone has **witnessed many seismic activities** in the past including the 1869 earthquake (7.8 magnitude) and the 1943 earthquake (7.3 magnitude).

Indonesia"s Ibu volcano erupts

Ibu Volcano

- It is a **stratovolcano** located in the province of **Maluku, East Indonesia.**
- It is one of the most isolated and least accessible volcanoes in Indonesia.
- It stands as high as 1,377 metres above sea level.

Stratovolcano

- The stratovolcano is a tall, steep, and cone-shaped type of volcano.

- **Unlike flat-shield volcanoes**, they have higher peaks. At their peak, stratovolcanoes usually have a small crater. The crater may be filled with water or ice, or it may contain a volcanic dome during a period of relative inactivity.
- Stratovolcanoes comprise the **largest percentage (~60%)** of the Earth''s volcanoes, and most are characterised by eruptions of andesite and dacite, lavas that are cooler and more viscous than basalt.
- These more viscous lavas allow gas pressures to build up to high levels. Therefore, these volcanoes often suffer explosive eruptions.
- They are usually half lava and half pyroclastic material, and the layering of these products gives them their other common name of composite volcanoes.

Fight for Ghaggar''s rights: Residents

Ghaggar River

- It is an **intermittent river** that **flows only during the monsoon** season.
- **Course**:
  - It **rises from the Shivalik Range**in northwestern **Himachal Pradesh.**
  - It **flows about 200 miles** (320 km) southwest **through Haryana state,** where it **receives the Saraswati River.**
  - It eventually **dries up in the Thar Desert**in Rajasthan.
- This seasonal river **feeds two irrigation canals that extend into Rajasthan**. The **Hakra, which flows in Pakistan**, **is the continuation of the Ghaggar River** in India, and they are **together called the Ghaggar - Hakra River.**
- **Historical Significance:**
  - Several **historians identify Ghaggar with the Vedic Saraswati River.**
  - Along the banks of the Ghaggar River, **many settlements of the Indus Valley Civilization have been excavated.**
  - Hence it is believed that the ancient settlements on its banks are the **creation of ingenious Vedic Aryans.**
  - It is believed that the **rivers Sutlej and Yamuna once flowed into the Ghaggar-Hakra river bed.**
- **Tributaries**: The main tributaries of the Ghaggar are the **Kaushalya River, Markanda, Sarsuti, Tangr**i, and Chautang.

US F-16 crashes into Yellow Sea off South Korea, says Yonhap report

Yellow Sea

- It is a **marginal sea in** the **western Pacific Ocean.**
- **Location**:
  - It is situated **between mainland China** to the west and north, the **Korean Peninsula** to the east, and **the Shandong Peninsula and Liaodong Peninsula** to the south.
  - It is positioned to the **north of the East China Sea**.

- The sea was **named for the yellowish sand particles** originating **from the Gobi Desert that descend on the surface of the sea,** thereby giving it a golden yellow color.
- **Size**: Also referred to in China as Huang Hai and in North and South Korea as the West Sea, the Yellow Sea is 870 kilometres long and 556 kilometres wide, covering **an area of 380,000 sq km.**
- **Depth**: It is **one of the largest shallow areas of the continental shelf in the world,** with an average depth of 44 metres and a maximum depth of 152 metres.
- **Inflow**: The main rivers that drain into the Yellow Sea include the **Hai River, the Yalu River, the Han River**, the Taedong River, and the Yellow River.
- **Islands**: The Yellow Sea is dotted with numerous islands, the la**rgest of which include Jeju Island** (South Korea), **Shandong Peninsula islands** (China), and Ganghwa Island (South Korea).
- **Climate**: The climate is characterized by very **cold, dry winters and wet, warm summers.**
- **Currents**:
  - The **warm current of the Yellow Sea is a part of the Tsushima Current,** which diverges near the western part of the Japanese island of Kyushu and flows at less than 0.5 mile (0.8 km) per hour northward into the middle of the sea.
  - **Along the continental coasts, southward-flowing currents prevail,** which strengthen markedly in the winter monsoon period, when the water is cold, turbid, and of low salinity.

India's extreme Rainfall Corridor

- How has the Indian monsoon been affected by global warming? What has a new study on large-scale extreme rainfall found and what is its significance? How will this study improve forecasts and reduce risks associated with large-scale rainfall events?
- The Indian monsoon has well-known features, such as the onset of the monsoon, the withdrawal, the active and break periods, and the low-pressure systems (or monsoon depressions).
- Every aspect of the monsoon has been **affected by global warming.**
- The total seasonal rainfall has also trended downwards for more than seven decades, due to the differential **heating of the land versus the ocean due to global warming.**
- However, this trend has been distributed unevenly through the monsoon season — as manifested in the longer duration but **lower intensity of dry spells and the greater intensity of wet spells.**
- While the India Meteorological Department (IMD) has made progress in forecasting extremes, multiple factors can combine to produce devastating heavy rain events that remain hard to anticipate.

Where does extreme rain occur?

- India's monsoon forecasts rely heavily on its relation to the **El Niño and the La Niña phenomena**, although this relation holds only about 60% of the time.

- We also know of other global relations but translating them to better predictions requires careful modeling experiments.
- Researchers are also continuing to search for additional process understanding, especially for high-impact extreme rainfall events.
- A new study (of which the author was part) has found that despite all these seemingly disparate changes in different aspects of the monsoon dynamics, a remarkable stationary element exists in terms of where the synchronized extreme rainfall events occur.
- The so-called **large-scale extreme rainfall events** are simultaneous or near-simultaneous heavy rain episodes that are strewn across a 'highway' that extends from parts of West Bengal and Odisha to parts of Gujarat and Rajasthan.
- The most remarkable new finding is that this corridor has remained unchanged from 1901 to 2019.
- In the seemingly chaotic change in all aspects of the monsoon, such trapping of the extreme events to a relatively narrow corridor is good news for potential improvements in process understanding, which is bound to lead to better predictions of these synchronized extreme rainfall events.

What does this mean for the monsoon's stability?

- Traditional statistical methods tend to miss the complex relations between multiple nodes of rainfall centers.
- Rainfall data from the IMD at a 25-km scale in latitude and longitude offers a rich field over which sophisticated network analysis can be applied to extract the nodes that have the highest synchronicity in rainfall with other nodes near and far.
- This analysis — applied in this study — found that the most active nodes have followed this 'highway' for more than a century.
- The link lengths between nodes, or the scales of synchronicity, have remained nearly constant, at an average value of about 200 km.
- We can use **a popcorn and kettle analogy** here to understand this better. Central India is the kettle that warms up from the pre-monsoon into the monsoon.
- The monsoon rainfall systems are like kernels of corn popping randomly across the kettle.
- But it turns out that the kernels are popping in a synchronous dance, an indication that large groups of popcorn are jumping up at the same time.
- An analysis of winds and other circulation features indicates that the monsoon domain has been unique in remaining fairly stable for the formation of these extremes despite the various kicks from all tropical oceans and from pole to pole.

What do the findings mean for forecasts?

- Some researchers have said that stationary elements no longer exist in climate systems because of global warming.
- Yet the Indian monsoon continues to produce surprises in the way it can synchronize heavy rain events as well as stick to the 'highway' for such a long time.

- This is also the corridor for the monsoon depressions, which themselves have shown an increase at the 3- to 10-day timescales while decreasing at lower frequencies of 10-60 days.
- These changes are manifest in the active and break periods, as stated above.
- The main candidate for the geographic trapping of synchronized extreme rainfall is likely to be the range of mountains running along the west coast and across Central India.
- This hypothesis needs to be tested in models, but its implications for improving forecasts of such events are undeniable.
- The finding also suggests that to improve forecasts, increasing the model resolution and the computational cost may not be necessary.
- Instead, the focus can be on the dynamics of synchronization.
- The potential for reducing risk at a smaller scale from these large-scale extreme rainfall events, for agriculture, water, energy, transportation, health, etc., is also alluring.
- Fortunately, India is in a solid position vis-à-vis its modeling capacity and computational resources to fully exploit this potential.

'Mission Antarctica'

- Raksha Rajya Mantri Shri Ajay Bhatt flagged-in, in New Delhi on December 13, 2023, a team of Himalayan Mountaineering Institute, Darjeeling that carried out 'Mission Antarctica'.
- The expedition, which commenced in 2021, was undertaken by a team of three trekkers, led by Group Captain Jai Kishan.

Antarctica

- Antarctica is the **fifth-largest continent** in terms of total area as it is larger than both **Oceania and Europe.**
- Antarctica is a unique continent in that it **does not have a native human population.**
- There are no countries in Antarctica, although seven nations claim different parts of it: **New Zealand, Australia, France, Norway, the United Kingdom, Chile, and Argentina.**
- Despite its size and harsh environment, Antarctica is vulnerable to damage from human activities.
- The continent of Antarctica comprises the majority of the Antarctic region.
- The Antarctic Convergence encompasses a frigid, desolate territory in the Southern Hemisphere known as the Antarctic.
- The Antarctic Convergence is an **irregular line of latitude** where frigid, northward-flowing Antarctic waters meet warmer ocean waters.
- The Antarctic takes up roughly **20% of the Southern Hemisphere.**
- The Antarctic also includes island territories within the Antarctic Convergence.
- The islands of the Antarctic region are:
- The South Orkney Islands, South Shetland Islands, South Georgia, and the South Sandwich Islands, all **claimed by the United Kingdom;**
- Peter I Island and Bouvet Island, **claimed by Norway;**
- Heard and McDonald Islands, **claimed by Australia;**

- Scott Island and the Balleny Islands, **claimed by New Zealand.**

Physical Geography of Antarctica

- The Antarctic Ice Sheet is the **world"s largest single chunk of ice.**
- The ice surface expands substantially from approximately three million square kilometers (1.2 million square miles) at the end of summer to approximately 19 million square kilometers (7.3 million square miles) by winter.
- The **Transantarctic Mountains**, which divide Antarctica into eastern and western areas, have multiple high peaks.
- Without ice, Antarctica would form a massive peninsula and archipelago of mountainous islands known as Lesser Antarctica, as well as a single enormous continent around the size of Australia known as Greater Antarctica.
- **Greater Antarctica, or East Antarctica**, is composed of older, igneous and metamorphic rocks.
- **Lesser Antarctica, or West Antarctica**, is made up of younger, volcanic and sedimentary rock. It is part of the Ring of Fire around the Pacific Ocean.
- **Mount Erebus**, located on Antarctica's Ross Island, is the **southernmost active volcano** on Earth.

Climate and Waters

- Antarctica has a harsh, arid climate.
- The average winter temperature along Antarctica"s coast ranges from -10° to -30° C (14° to -22° F).
- Coastal locations in the summer have temperatures that range from 0°C (32°F) to 9°C (48°F).
- The Antarctic region is crucial to global climate systems. It is an essential component of the Earth"s thermal balance.
- Ice reflects more light than land or ocean surfaces. The vast Antarctic Ice Sheet reflects a significant amount of solar radiation away from the Earth"s surface.
- The reflectance of the Earth"s surface diminishes when global ice cover (ice sheets and glaciers) declines.
- This allows more incoming solar radiation to be absorbed by the Earth"s surface, resulting in an unbalanced heat balance associated with global warming, the current phase of climate change.
- The waters surrounding Antarctica constitute an important component of the **"ocean conveyor belt,"** a global system in which water travels around the world based on density and currents.
- Antarctic Bottom Water, the chilly seas surrounding Antarctica, are so dense that they push up against the ocean floor.
- Warmer waters rise or upwell as a result of the Antarctic Bottom Water.
- Antarctic upwelling is so powerful that it aids in the movement of water around the entire planet. Strong winds that circumnavigate Antarctica contribute to this travel.
- Earth"s waters would not flow in a balanced and effective manner without the assistance of the oceans surrounding Antarctica.
- The National Geographic Society designated the Antarctic Ocean as the Southern Ocean in 2021.

Flora and fauna

- **Lichens, mosses, and terrestrial algae** are among the few plant species found in Antarctica.
- The **northern and coastal sections** of Antarctica have **more of this vegetation**, while the interior has little to no vegetation.
- Thousands of species, including krill, feed on plankton. In the chilly Antarctic waters, fish and a wide diversity of marine mammals flourish.
- Antarctica has healthy populations of blue (Balaenoptera musculus), fin (Balaenoptera physalus), humpback (Megaptera novaeangliae), right, minke, sei (Balaenoptera borealis), and sperm whales (Physeter macrocephalus).
- The leopard seal (Hydrurga leptonyx) is a top predator in Antarctica. The leopard seal is one of the most vicious marine predators.
- The **penguin** is undoubtedly the **most well-known animal** in Antarctica. They''ve adapted to the frigid waters of the shore.

Indian Antarctic Program

- The Indian Antarctic Programme is managed by the **National Centre for Polar and Ocean Research (NCPOR)**, which is part of the Ministry of Earth Sciences.
- The **first Indian Antarctic expedition** took place in
- After **India ratified the Antarctic Treaty in 1983** and erected the **Dakshin Gangotri Antarctic** research station, which was **replaced by the Maitri location in 1989**, the initiative gained global acceptance.
- **Bharati,** a base composed of 134 shipping containers, was the **most recently operational** in
- As part of the initiative, India has launched 40 scientific expeditions to the Antarctic and is studying atmospheric, biological, earth, chemical, and pharmaceutical sciences.

Almora Fault

There has been an increase in the number of earthquakes from January to November 2023 compared to the last three years, Union Minister of Earth Sciences Kiren Rijiju told the Lok Sabha on December 6, 2023.

- However, experts have questioned the government's information on the causes of the increase in earthquakes.
- It is a **geological fault** that runs through **Western Nepal and into India''s Uttarakhand area.**
- It is located in the **Himalayan fault zone on the Main Boundary Thrust (MBT).**
- In **Kumaon, Uttarakhand,** there are **two thrusts:** the **South Almora Thrust** and the **North Almora Thrust.**
- **MBT (Main Boundary Thrust):** This is a prominent Himalayan fault that **separates the Lesser Himalayas from the Sub-Himalayas.**
- The **Main Himalayan Thrust (MHT)** is a décollement under the Himalaya Range.
- This thrust fault follows a NW-SE strike, reminiscent of an arc, and gently dips about 10 degrees towards the north, beneath the region.
- It is the **largest active continental megathrust fault** in the world.

Background Seismicity and Recent Spike

Consistent Background Seismicity:

- The Earth Sciences Minister emphasized the consistent level of background seismic activity in the regions under consideration, indicating normal earthquake occurrences.

Recent Earthquake Surge:

- Despite the persistent background seismicity, specific locations in north India and Nepal suffered a surge in seismic occurrences, which was linked in part to the activation of the Almora fault.

The Almora Fault"s Role in Earthquake Occurrences

Significant Earthquakes:

- In recent seismic activity, the Almora fault, a critical geological structure in the western Himalayas, has played a critical role.

Key Mainshocks and Their Magnitudes:

- Notable earthquakes were observed on January 24 (5.8 magnitude), October 3 (6.2 magnitude), and November 3 (6.4 magnitude), all of which were associated to the Almora fault.

Geological Significance:

- The fault line is located near active faults in the Himalayan region, where the Indian plate subducts beneath the Eurasian Plate, resulting in frequent seismic occurrences.

Impact and Concerns

Geographical Impact:

- The seismic occurrences had a wide-ranging impact, with tremors felt throughout a large area.
- For example, the January 24 Nepal earthquake was felt powerfully in Delhi, Uttar Pradesh, and Uttarakhand.

Concerns about safety and preparedness:

- The recent activation of the Almora fault has sparked worries about area safety measures and earthquake preparedness.

Efforts at Mitigation and Safety Measures

Initiatives of the Bureau of Indian Standards (BIS):

- The BIS has played a major part in the release of the Seismic Zoning Map of India, categorising locations into distinct danger zones (II to V), and providing standards for the construction of earthquake-resistant structures.

Interventions by the National Disaster Management Authority (NDMA):

- To improve preparedness and response capacities in seismic zones, the NDMA is actively adopting preventative measures including earthquake exercises, awareness programs, and incident management tactics.

Lessons and Continued Vigilance

Aftermath and Aftershocks:

- More than 382 aftershocks were recorded in the aftermath of the earthquakes, particularly the severe November 3 quake with a magnitude of 6.4.
- It emphasized the importance of maintaining vigilance and adhering to safety protocols in seismically active areas.

Regional Security and Current Concerns:

- The latest seismic incidents highlight the ongoing concern for regional safety and the importance of ongoing work in earthquake preparedness and risk reduction techniques.

The Earth Sciences Minister''s statement emphasized the heightened seismic activity in specific places caused by the activation of the Almora fault.

- By emphasizing the significance of geological structures such as the Almora fault and the subsequent impact on safety, the minister emphasizes the importance of proactive measures, guidelines, and initiatives aimed at mitigating earthquake risks and improving preparedness in earthquake-prone areas.

National Geoscience Data Repository Portal

The Union Ministry of Mines is to launch the National Geoscience Data Repository (NGDR) Portal on 19th December 2023 in a ceremony in New Delhi.

National Geoscience Data Repository Portal

- It is an extensive **web-based tool for geospatial data access**, **sharing, and analysis** in India.
- The **Geological Survey of India (GSI)** and the **Bhaskaracharya Institute of Space Applications and Geoinformatics (BISAG-N)** led the NGDR effort.
- It is a major step towards democratising important **geoscience data**, giving academics and industry stakeholder's unparalleled access to priceless resources.

Key Facts about Geological Survey of India

- The **primary goal** of the Geological Survey of India (GSI), founded in 1851, was **to locate coal reserves for the railways.**
- As time has gone on, GSI has not only expanded into a national repository for geoscience data needed in a variety of sectors, but it has also gained recognition as a reputable geoscientific organisation worldwide.
- Its primary responsibilities include mineral resource evaluation and the creation and upgrading of national **geoscientific data.**
- The main responsibility of GSI is to provide **current, unbiased, and objective geological expertise as well as geoscientific information of all types**, with an emphasis on the demands of business, society, and policymakers.
- The GSI also places a strong emphasis on the methodical recording of all surface and subsurface geological processes in India and its offshore regions. The firm uses the newest and most economical tools and approaches to carry out this task through geological, geophysical, and geochemical studies.
- The **Ministry of Mines**'' affiliated office is called GSI.
- **Head Office:** Kolkata
- Its state unit offices are dispersed throughout nearly every state in the nation, and its six regional offices are situated in Lucknow, Jaipur, Nagpur, Hyderabad, Shillong, and Kolkata.

Bab al-Mandab Strait

- Prime Minister Narendra Modi and Israeli Prime Minister Benjamin Netanyahu held a telephone discussion on the escalating threats to maritime security in the Red Sea because of the actions of Houthi militants of Yemen.

- The conversation came soon after the Pentagon announced an international mission to counter the growing number of attacks against Israel-bound international traffic.

Bab al-Mandab Strait

- It is a strait that connects the **Red Sea (northwest) with the Gulf of Aden and the Indian Ocean (southeast)**.
- It is located **between Arabia (northeast) and Africa (southwest).**
- It is an important strategic connection in the marine commerce route connecting the **Mediterranean Sea to the Indian Ocean via the Red Sea and the Suez Canal.**
- It is one of the world''s **most important seaborne commodity shipping routes**, primarily for crude oil and petroleum.
- **Yemen borders** it on the **Arabian Peninsula**, and **Djibouti and Eritrea border** it on the **African coast.**

The following are the most important facts regarding the Red Sea:

- It is a semi-enclosed inlet (or extension) of the Indian Ocean located between the African and Asian continents. It has one of the hottest waters on the planet.
- The Sinai Peninsula divides the northern Red Sea into the Gulfs of Aqaba and Suez, where it connects to the Mediterranean Sea via the famed Suez Canal.
- Yemen and Saudi Arabia share a border with the Red Sea to the east.
- Egypt borders it to the north and west, and Sudan, Eritrea, and Djibouti border it to the west.

Straits

- A strait is a naturally created, narrow, and usually navigable stream that joins two bodies of water.
- It is most typically a body of water **that connects two geographical masses.**
- Some straits are impassable because they are too shallow, or because of an impassable reef or archipelago.
- Straits are feasible as a result of the narrow-shaped **isthmus fracture.**
- It connects many bodies of water. Straits, according to folklore, form as a result of plate tectonic action. For example, tectonic action in Africa generated the Strait of Gibraltar.
- It''s a breakdown of the Gibraltar Isthmus. Human action, on the other hand, generates straits known as canals.
- It directs water flow for home and commercial purposes. Suez Canal, completed in 1869, is one such strait.
- It acts as a watershed between the Mediterranean and the Red Sea.
- Originally built for commerce, it now functions as a waterway connecting Europe and Asia.
- Without a watershed, one would have to cross into Africa to deliver products, which lengthens the voyage time.
- As a result, specific straits are built to boost commercial activity.
- Straits can also form when bodies of water flood.
- Straits can also emerge as a result of erosion and landslides.
- The Bosporus is a waterway that connects the Black Sea to the Aegean Sea.
- Bosporus formed naturally as a result of weathering and erosion.

- The Bosporus is important to geologists because it is the only physical barrier between Europe and Asia.

Significance of straits

- Straits play a vital part in **commercial shipping"s seaborne trade.**
- They are very essential in
- For millennia, the straits have been vital to **human culture.**
- They are crucial in **economic and military affairs.**
- Commercial shipping uses the world"s major straits to go from one exclusive zone or sea to another.
- The Straits of Hormuz are very significant both commercially and strategically. Many ships use the straits as passable routes.
- **The Strait of Hormuz**, for example, is critical because it transports **one-third of the world"s oil commerce.**
- Straits are also used to generate tidal power using turbines. **Cook"s Strait in New Zealand**, for example, generates 5.6 GW of energy.
- The Strait has an important function in serving as a route through which ocean currents move, aiding in the mortification of the climate in that area.
- As a result, straits play an important role in both physical and human geography.

Gulf

- The gulf is a sea portion that penetrates within the land.
- It connects both land and sea.
- The gulf is usually formed naturally.
- The Gulf is very helpful for harbouring ships.
- Sometimes, it is also considered a large bay.
- eg: Gulf of Mannar, Persian Gulf

Distinctions between the Gulf and the Strait

- Gulfs and Straits are regarded as geographical features on the earth"s surface. The aquatic body includes both gulfs and straits.
- The term "gulf" refers to a deep inlet within the sea with a limited opening.
- The term "gulf" refers to the portion of the ocean that penetrates the land. It can differ in shape, depth, and size.
- A strait is a narrow canal that connects to a larger body of water. Because the connector connects two watersheds, it is formed by an isthmus fracture. Generally, straits form as a result of tectonic movements.
- The gulf and Straits of Hormuz are both man-made and natural; they serve economic purposes.
- The Gulf of Mexico and Oman have served as economic hubs for transportation and trade.
- The Gulf of Mexico is the largest gulf and is used for recreational, commercial, and sporting purposes.
- The Suez Canal is the world"s greatest man-made strait for trade and transit.

Summing up

- The Gulf and straits are important geological structures formed by biological activity.

- However, the differences can be detected by their size, shape, and depth, among other things.
- The gulf is a sea section that penetrates the mainland, whereas straits are enclosed on all sides by water.
- The Gulf of Mexico has a tiny mouth, and the strait as a whole is narrow. Both are used in business and commerce.

Illegal sand mining: 20 arrested, 40 big boats seized in Bihar police operation on Sone River.

- Bihar police have arrested 20 sand smugglers and seized 40 sand-laden boats in a major crackdown against illegal sand mining on the Sone River.
- It is one of the largest southern tributaries of the Gangesafter the Yamuna River.
- Origin: It originates from the Amarkantak highlands in the hills of the Maikala range in Bilaspur district of Chhattisgarh at an elevation of 640 m. (The Narmada River also originates from Amarkantak, though it flows westward while Sone journeys towards the east).
- The river cuts through the Kaimur Rangeand joins the Ganges above Patna in Bihar after a 487-mile (784-km) course.
- It flows through the states of Chhattisgarh, Madhya Pradesh, Uttar Pradesh, Bihar, and Jharkhand.
- The total catchment area of the river system is 70,055 sq.km.
- The Sone valley is geologically almost a continuation of that of the Narmada Riverto the southwest. It is largely forested and sparsely populated.
- The valley is bordered by the Kaimur Range to the north and the Chota Nagpur plateau to the south.
- The floodplain of the river is narrow and only, 3 to 5 kilometers wide.
- The river's flow is seasonal, and the Sone is unimportant for navigation.
- Major Tributaries: The main tributaries of the Sone River are the Rihand Riverand the Koel River. The other tributaries are the Gopad River and the Kanhar River.
- Dehri is the major town situated on the Sone River.

India re-elected to International Maritime Organisation Council with highest tally

International Maritime Organisation:

- It is a **specialized agency** of **the United Nations** which is responsible for measures to improve the safety and security of international shipping and to prevent pollution from ships.

- It is the global **standard-setting authority** for the safety, security and environmental **performance of international shipping.**
- Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented.
- **Formation:** It was established as the Inter-Governmental Maritime Consultative Organization (IMCO) in 1948, became a specialized agency of the United Nations in 1959 and was renamed International Maritime Organization in 1982.
- **Structure of the organisation:**
  - **Assembly:** It is the **highest Governing Body** of the IMO. It consists of all Member States, and it meets once every two years in regular sessions. The Assembly is responsible for approving the work program, voting the budget and electing the Council.
  - **Council:** It is **the Executive Organ** of the IMO and is responsible, under the Assembly, for supervising the work of the Organization.
  - **Committees:** The five policy-making committees are responsible for the development, review, updating, and approval of the organization's guidelines and regulations.
- **Funding:** Funding for the organization comes from contributions by Member States, as well as voluntary donations and commercial activities.
- **Members:** It currently has **175 Member States**.
- **Headquarters:** London.

At COP28, donors join IFC to lure $11 bln in climate cash

Allied Climate Partners

- It is a **philanthropic investment organisation.**
- **Mission:** With a mission to increase the number of bankable, climate-related projects and businesses in emerging markets and developing economies to create significant environmental, economic, and social impact.
- Its initial focus regions are Southeast Asia, the Caribbean and Central America, Africa, and India.

International Finance Corporation

- It was founded in 1956 with Washington, DC as its headquarters.
- It is a member of the World Bank Group.
- **Mandate:** Advance economic development and improve the lives of people by encouraging the growth of the private sector in developing countries.
- **Functions:**
  - It helps countries develop their private sectors in a variety of ways
  - Investing in companies through loans, equity investments, debt securities and guarantees.

- Mobilising capital from other lenders and investors through loan participations, parallel loans and other means.
- Advising businesses and governments to encourage private investment and improve the investment climate.

- **Governance:** The IFC is owned and governed by its member countries. It is a corporation whose shareholders are member governments that provide paid-in capital and have the right to vote on its matters.

Pentagon claims USS Carney, multiple commercial ships attacked in Red Sea
Red Sea

- It is a **semi-enclosed inlet** (or extension) **of** the **Indian Ocean between** the continents of **Africa and Asia**. It is one of the world's **warmest seas.**
- It is **connected to the Arabian Sea** and the Indian Ocean to the south **through the Gulf of Aden and** the narrow **strait of Bab El-Mandeb**.
- The **northern portion** of the Red Sea is **bifurcated by the Sinai Peninsula into** the **Gulf of Aqaba and** the **Gulf of Suez**, where it is **connected to the Mediterranean Sea via the famous Suez Canal.**
- **Bordering Countries:**
  - **Yemen** and **Saudi Arabia** border the Red Sea to the east.
  - It is bordered by **Egypt** to the north and west and by **Sudan**, **Eritrea**, and **Djibouti** to the west.

- This sea has a surface area of roughly 438,000 km2 and is about 2,250 km in length.

- The maximum width of the sea is 355 km, and the sea's deepest point is 3,040 m at the central Suakin Trough, with the sea's estimated average depth being 490 m.

- **Islands**: Some well-known islands include **Tiran Island**, which is located near the mouth of the Gulf of Aqaba, and **Shadwan Island**, which is located at the entrance of the Gulf of Suez.

Kamboj chairs briefing ahead of 62nd UN Commission for Social Development
UN Commission for Social Development (CSocD)

- CSocD, formerly known as the Social Commission, is a **functional commission of** the Economic and Social Council (**ECOSOC) of the United Nations**.
- It has been in **existence since** the very **inception of the United Nations**, **advising ECOSOC and governments** on a wide range of social policy issues and from the social perspective of development.
- **Purpose:**
  - Its primary purpose is to **advance social development** and **formulate policies and recommendations** to address global social issues.
  - It focuses on topics such as **poverty eradication, social inclusion**, and the promotion of **equitable and sustainable development.**

- Since the 1995 World Summit for Social Development in Copenhagen, the CSocD has been the key **UN body in charge of** the follow-up and **implementation of the Copenhagen Declaration and Programme of Action.**

- **Membership:**
  - 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** for **four-year terms.**
- **Meetings:**
  - The CSocD meets **every year at** the **United Nations Headquarters in New York**, typically in February.
  - During its meetings, **member states**, international **organisations**, **and civil society** representatives **come together to discuss** and address various social development issues.

Economic and Social Council (ECOSOC)

- It is **one of the six principal organsof the UN,** which was **established by the UN Charter (1945).**
- It is responsible for the direction and **coordination of the economic, social, humanitarian, and cultural activities** carried out **by the UN.**
- **Decisions** are taken **by a simple majority vote.** The **presidency** of ECOSOC **changes annually.**
- **Members:**
  - It has **54 members,** which are **elected for three-year terms by** the **General Assembly.**
  - **Four of** the **five permanent members of the Security Council** have been **continuously re-elected.**
  - This is **because they provide funding** for most of ECOSOC's budget, which is the largest of any UN subsidiary body.
- **Functions:**
  - ECOSOC is responsible for **coordinating the social and economic fields** of the organisation, specifically in regards to the 15 specialised agencies, **the five regional commissions** under its jurisdiction and eight functional commissions.
  - It also serves as a ce**ntral forum to discuss international social and economic issues** and **formulate policy recommendations** addressed to the member states and the United States system.

International Social Security Association's ISSA Vision Zero 2023 Award

International Social Security Association

- It is the principal international institution bringing together social security agencies and organisations of the world.
- **Aim:** To **promote dynamic social security** as the social dimension in a globalising world by supporting excellence in social security administration.

- It was **founded in 1927** under the **auspices of the International Labour Organization**
- It has over 320 member institutions from over 160 countries.
- **Headquarters:** Geneva (at the International Labour Office)
- It provides access to information, expert advice, business standards, practical guidelines and platforms for members to build and promote dynamic social security systems worldwide.
- The vision of dynamic social security provides a framework for the ISSA''s actions.

Employees' State Insurance Corporation

- It is a statutory corporate body set up under the ESI Act 1948.
- It is responsible for the administration of the ESI Scheme.
- **Headquarter:** New Delhi
- **Composition**
    - Chairman: The Union Minister of Labour
    - The Central Government appoints a **Director General** as the **Chief Executive Officer of ESIC.**
    - The ESIC comprises members representing crucial interest groups, including employers, employees, the Central and State Governments, representatives of the Parliament and the medical profession.
    - **Standing Committee**: It is constituted from among the members of the ESIC, which acts as an executive body.
    - The Standing Committee has the power to administer the affairs of the ESIC and perform functions of the ESIC under its overall control and superintendence.
    - The Secretary, Ministry of Labour, is the Chairman of the Standing Committee.
    - The **Director General** of the ESIC is also **an ex-officio member** of the Standing Committee.
    - The other members of the Standing Committee are nominated and elected among the members of the ESIC.
    - The **nominated members include** the following: 3 members of the Central and State Governments, 3 members representing employers and employees, and 1 member representing Parliament and the medical profession.

Foreign Secretary Vinay Kwatra, UN Under Secretary General discuss India"s presidency of Conference on Disarmament

Conference on Disarmament (CD):

- The CD was formed in 1979 as the single multilateral disarmament negotiation forum of the international community after agreement was reached among Member States during the first special session of the UN General Assembly (UNGA) devoted to disarmament (1978).
- It succeeded other Geneva-based negotiating forums, which included the Ten-Nation Committee on Disarmament (1960), the Eighteen-Nation Committee on Disarmament (1962-68), and the Conference of the Committee on Disarmament (1969-78).
- The CD and its predecessors negotiated major multilateral arms control and disarmament treaties such as:
    - **Treaty on the Non-Proliferation of Nuclear Weapons (NPT)**
    - Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction **(BWC)**
    - Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction **(CWC)**
    - **Comprehensive Nuclear-Test-Ban Treaty (CTBT).**
- Currently, the CD focuses its work on the following agenda items:
    - Cessation of the **nuclear arms race**and nuclear disarmament.
    - Prevention of **nuclear war,** including all related matters.
    - Prevention of **an arms race in outer space.**
    - Effective international arrangements to assure non-nuclear-weapon states against the use or threat of use of nuclear weapons.
    - New types of weapons of mass destruction and new systems of such weapons; radiological weapons.
    - Comprehensive programme of disarmament.
    - Transparency in armaments.
- **Working:**
    - The Conference is comprised of **65 member states**, including the five NPT nuclear-weapon states and 60 other states of key military significance.
    - In addition, every year, non-member states participate, upon their request, in the CD's work.
    - The CD has **three sessions each year.**

- The CD conducts its work by consensus.

- **Relationship with the United Nations (UN):**
  - While the CD is independent of the United Nations, its secretary is appointed by the UN Secretary-General.
  - It is required to consider recommendations from the UNGA, and it submits reports annually or more often to the UNGA.
  - The CD adopts its own Rules of Procedure and its own agenda, taking into account the recommendations of the UNGA and the proposals of its member states.

Donald Tusk elected as Prime Minister of Poland

- The Prime Minister, Shri Narendra Modi has congratulated Excellency Donald Tusk on being elected as Prime Minister of Poland.

Poland

- It is a country located in **Central Europe and is the fifth-most populous member state** of the European Union.
- **Warsaw is the capital** of Poland.
- It is **bordered by Lithuania** and **Russia to the northeast**, **Belarus and Ukraine to the east**, **Slovakia and the Czech Republic to the south**, and **Germany to the west**.
- It also shares maritime boundaries with Denmark and Sweden.

Geography of Poland

- Poland is the **ninth-largest** country in Europe.
- The **central and northern regions** of Poland bordering the **Baltic Sea** lie within the **flat Central European Plain**, but its south is hilly and mountainous.
- The country has a coastline spanning 770 km extending from the shores of the **Baltic Sea**, along the **Bay of Pomerania in the west to the Gulf of Gdańsk in the east.**
- The beach coastline is abundant in dune fields or coastal ridges and is indented by spits and lagoons, notably the Hel Peninsula and the Vistula Lagoon, which is shared with Russia.
- The **largest Polish island** on the **Baltic Sea is Wolin**, located within Wolin National Park.
- Poland also shares the **Szczecin Lagoon** and the **Usedom Island** with Germany.
- The mountainous belt in the extreme south of Poland is divided into two major mountain ranges the **Sudetes in the west** and the **Carpathians in the east.**
- **Poland's highest point is Mount Rysy** at 2,501 meters in elevation.

- The **lowest point** in Poland is situated at **RaczkiElblskie in the Vistula Delta**, which is 1.8 meters below sea level.
- Poland's longest rivers are the Vistula, the Oder, the Warta, and the Bug.
- The country also possesses one of the highest densities of lakes in the world.
- The **deepest is Lake Hańcza** at 108.5 metres in depth.

Global Status Report on Road Safety

The Global Status Report on Road Safety by the World Health Organization (WHO) provides a comprehensive assessment of road traffic deaths worldwide and the progress made in reducing them.

Key Highlights of the Report

- **Global Reduction in Deaths:** There"s been a 5% decrease in global road traffic deaths per year, totalling over 1.19 million annually. Although it"s a positive trend, the numbers remain alarmingly high.
- **Youth and Children at Risk:** Road accidents are the primary cause of death for individuals aged 5 to 29 years.
- **India"s Scenario:** India has experienced an increase in road crash deaths from 2018 to 2021, with 1,53,792 deaths in 2021 compared to 1,50,785 in 2018.
- **Progress and Challenges:** While some countries have seen a reduction in road traffic deaths, disparities exist. Low and middle-income countries, despite having a minimal share of the world"s vehicles, account for 90% of road traffic deaths.
- **Vulnerable Road Users**: Over half (53%) of road traffic fatalities are vulnerable road users, including pedestrians, motorcyclists, cyclists, and users of micro-mobility devices.
- **Infrastructure and Safety Standards:** There are concerns about inadequate road infrastructure, lack of pedestrian safety measures, and gaps in laws related to risk factors such as speeding, drunk driving, and vehicle safety features.
- **Legislative Gaps and Recommendations:** Only a small number of countries meet WHO"s best practices for road safety laws. The impending doubling of the global motor vehicle fleet by 2030 emphasizes the urgent need for improved legislation and infrastructure to prevent road traffic deaths.

Road Safety in India

- India faces a complex road safety landscape due to its rapid economic growth and the resultant surge in vehicle ownership. This growth brings convenience and progress, yet it also intensifies challenges in ensuring safety on the roads.

Challenges

High accident rates

- Despite having only 1% of the world"s vehicles, **India contributes to 11% of global road traffic deaths, resulting in approximately 1.5 lakh lives lost annually.**

- The disproportionate number of fatalities in relation to the number of vehicles suggests a pressing issue with road safety in India.

Vulnerable road users

- Pedestrians, cyclists, and motorcyclists are at a higher risk due to inadequate infrastructure and insufficient awareness.
- **Incomplete or poorly designed roads** may not account for the safety of those not in motorized vehicles, leading to a higher incidence of accidents involving vulnerable road users.

Speeding and reckless driving

- Disregarding traffic rules and exceeding speed limits is a major contributor to accidents.
- Behavioural issues, such as reckless driving, significantly contribute to the overall road safety problem.

Inadequate infrastructure

- **Poor road conditions, lack of proper lane markings**, and inadequate signage contribute to safety risks.
- Infrastructure plays a crucial role in ensuring safe road usage, and deficiencies in these aspects can lead to accidents.

Drunken driving

- Despite legal prohibitions, driving under the influence of alcohol or drugs is a serious concern.
- Despite regulations, the prevalence of driving under the influence poses a considerable threat to road safety.

Weak enforcement

- Insufficient traffic monitoring and lax enforcement of road safety laws hamper progress.
- Even with regulations in place, a lack of effective enforcement diminishes the impact of these laws, allowing for a more lenient approach to road safety.

Steps to address these challenges

Stricter laws and enforcement

- **The Motor Vehicles (Amendment) Act 2019 imposed harsher penalties for traffic violations,** aiming to deter dangerous driving.
- Strengthening legal consequences for violations can act as a deterrent and promote safer driving practices.

Focus on vulnerable road users

- Initiatives like building dedicated cycling lanes and pedestrian walkways prioritize their safety.
- Targeted infrastructure improvements can protect those at higher risk, creating a safer environment for pedestrians and cyclists.

Road safety awareness campaigns

- Promoting responsible driving habits and educating the public about traffic rules is crucial.
- Informing the public about safe driving practices and rules can contribute to a culture of responsible behaviour on the roads.

Investing in infrastructure

- Upgrading roads, installing proper signage and lighting, and implementing intelligent traffic management systems can significantly improve safety.
- Infrastructure enhancements can directly address some of the challenges posed by inadequate roads and signage.

Technological advancements

- Utilizing technology like driver assistance systems and advanced traffic monitoring can enhance safety measures.
- Implementing technology in road safety measures can provide real-time monitoring and assistance, contributing to safer road conditions.

Way Forward

- Improving road safety requires a multi-pronged approach involving the government, civil society, and individual citizens. Continued efforts towards stricter enforcement, better infrastructure, public awareness campaigns, and technological advancements are key to creating safer roads for everyone.
- A comprehensive strategy, encompassing legal measures, infrastructure improvements, awareness campaigns, and technological solutions, is necessary to address the complexity of road safety challenges in India. Active participation from all stakeholders is crucial for sustained progress in making roads safer.
- The report underscores the urgent need for global action to prioritize road safety, particularly for vulnerable road users, and to address gaps in legislation, infrastructure, and safety standards. It highlights the necessity for concerted efforts by governments worldwide to reduce road traffic deaths and make roads safer for everyone.

ENACT Partnership

- Six new countries and a United Nations agency are joining the ENACT Partnership.
- The new partners include France, the United States of America, Belgium, the Netherlands, Switzerland, Pakistan, and the UN Environment Programme, including its World Conservation Monitoring Centre.

ENACT Partnership

- ENACT Partnership is a **global initiative that seeks to coordinate global efforts to address climate change, land and ecosystem degradation, and biodiversity loss through Nature-based Solutions.**

Founding Members

- Germany and Egypt, along with the International Union for Conservation of Nature launched ***ENACT (Enhancing Nature-based Solutions for an Accelerated Climate Transformation)*** at COP27, which took place at Sharm el-Sheikh, Egypt in December 2022.
- Canada, the European Union, Spain, Malawi, Norway, South Korea, Japan and Slovenia were also founding members of the partnership.

Meaning of Nature-based Solutions

- Nature-based Solutions involve working with and for, rather than against nature, which is critical to deliver the climate, biodiversity, and land restoration action necessary to steward human well-being for all.

Nature-based solutions proposed at the recent COP28

- ENACT partners are pushing at COP28 for the following concerning Nature-based Solutions:
    - Actions to limit warming to 1.5°C – by phasing out of all fossil fuels, including oil and gas and embracing just transition – to minimise climate-related losses and damage to people and nature. Meeting this goal is also essential to the continued provision of critical co-benefits for nature and people,
    - Increased funding and investment, particularly prioritizing local communities and accommodating an integrated approach to address climate change, biodiversity loss, and human well-being,
    - Stronger international collaboration and commitments to the rapid reduction of fossil fuel emissions and a commitment to implementation of Nature-based Solutions,
    - Robust data and monitoring systems which are essential for tracking progress and outcomes based on transparent reporting and accountability mechanisms.

Significance

- The role of Nature-based Solutions is increasingly being recognized as a complement **to the rapid phase-out of fossil fuels.**
- ENACT provides cohesive and action-oriented leadership that enables us to tap into the massive potential of nature in addressing the climate emergency.

Looking Forward

- To further operationalize the ENACT partnership, efforts are needed for

(1) Resourcing the initiative,
(2) Building the partnership,
(3) Launching the State of NbS Report & ENACT Dashboard, and
(4) Leading global communications about high integrity NbS for climate that integrates biodiversity concerns.

European Free Trade Association (EFTA)

Switzerland''s Ambassador to India has expressed optimism that the crucial European Free Trade Association (EFTA) deal with India would be wrapped up before the 2024 general elections.

European Free Trade Association (EFTA)

- The European Free Trade Association (EFTA) is **a regional trade organization and free trade area consisting of four European states: Iceland, Liechtenstein, Norway and Switzerland.**
- The **organization operates in parallel with the European Union (EU),** and all four member states participate in the European Single Market and are **part of the Schengen Area.**
- They are **not, however, party to the European Union Customs Union.**
- EFTA was established on 3 May 1960 to serve as an alternative trade bloc for those European states that were unable or unwilling to join the then European Economic Community (EEC), the main predecessor of the EU.
- The Stockholm Convention (1960), to establish the EFTA, was signed on 4 January 1960 in the Swedish capital by seven countries (known as the "outer seven": Austria, Denmark, Norway, Portugal, Sweden, Switzerland and the United Kingdom).
- A revised Convention, the **Vaduz Convention, was signed on 21 June 2001 and entered into force on 1 June 2002.**
- Since 1995, only two founding members remain, namely Norway and Switzerland. The other five, Austria, Denmark, Portugal, Sweden and the United Kingdom, had joined the EU at some point in the intervening years.
- The initial **Stockholm Convention was superseded by the Vaduz Convention**, which aimed to provide a successful framework for continuing the expansion and liberalization of trade, both among the organization''s member states and with the rest of the world.

- Whilst the **EFTA is not a customs union and member states have full rights to enter into bilateral third-country trade arrangements**, it does have a coordinated trade policy.
- As a result, its member states have jointly concluded free trade agreements with the EU and several other countries.
- To participate in the EU''s single market, Iceland, Liechtenstein, and Norway are parties to the Agreement on a European Economic Area (EEA), with compliances regulated by the EFTA Surveillance Authority and the EFTA Court.
- Switzerland has a set of multilateral agreements with the EU and its member states instead.

UNIDROIT

India's Uma Sekhar was elected to the governing council of the International Institute for the Unification of Private Law (UNIDROIT) in an election.

UNIDROIT

- **UNIDROIT**is an intergovernmental organization whose objective is to harmonize private international law across countries through uniform rules, international conventions, and the production of model laws, sets of principles, guides and guidelines.

Origins

- Established in 1926 as part of the League of Nations, it was re-established in 1940 following the League''s dissolution through a multilateral agreement, the UNIDROIT Statute.

Members

- As of 2023 UNIDROIT **has 65 member states.**

UNIDROIT's Convention

- UNIDROIT has prepared multiple conventions (treaties), but has also developed soft law An example are the UNIDROIT Principles of International Commercial Contracts.
- Distinctly different from the Convention on the International Sale of Goods (CISG)adopted by UNCITRAL, the UNIDROIT Principles do not apply as a matter of law, but only when chosen by the parties as their contractual regime.

Seat

- The seat of UNIDROIT is in Rome, Italy.

Membership

- Membership of UNIDROIT is restricted to States acceding to the UNIDROIT Statute.

- UNIDROIT's 65 Member States are drawn from the five continents and represent a variety of different legal, economic and political systems as well as different cultural backgrounds.

Funding

- The Institute is financed by annual contributions from its Member States which are fixed by the General Assembly.
- Extra-budgetary contributions may be made to fund specific projects or activities

Structure

- UNIDROIT has an essentially three-tiered structure, made up of a Secretariat, a Governing Council and a General Assembly. The Secretariat is the executive organ of UNIDROIT responsible carrying out its Work Programme from day to day.
- It is headed by a Secretary-General appointed by the Governing Council on the nomination of the President of the Institute.
- The Secretary-General is assisted by a team of international civil servants and supporting staff.

Annual Reports on the activity of UNIDROIT

- The Governing Councilsupervises all policy aspects of the means by which the Institute's statutory objectives are to be attained and in particular the way in which the Secretariat carries out the Work Programme drawn up by the Council. It is made up of one *ex officio* member, the President of the Institute, and 25 elected Members, mostly eminent judges, practitioners, academics and civil servants. The Governing Council is chaired by the President of the Institute who is a Member of the Council *ex officio*.
- **The General Assembly is the ultimate decision-making organ of UNIDROIT:** it votes the Institute's Budget each year; it approves the Work Programme every three years; it elects the Governing Council every five years.
- It is made up of one representative from each member Government. The Presidency of the General Assembly is held, on a rotating basis and for one year, by the Ambassador of one of the Organisation's member States.

Governing Council

- The Governing Council **consists of 25 positions which are held by distinguished legal experts.**

Languages

- The official languages of UNIDROIT are **English, French, German, Italian and Spanish;** its working languages are English and French.

Tax Inspectors Without Borders (TIWB)

Tax Inspectors Without Borders (TIWB), launched a programme in Saint Lucia on 14 December 2023.

Tax Inspectors Without Borders (TIWB)

- Tax Inspectors Without Borders (TIWB) is a **joint initiative of the Organisation for Economic Co-operation and Development (OECD) and the United Nations Development Programme (UNDP) supporting countries in building tax audit capacity.**
- TIWB Programmes complement the broader efforts of the international community to strengthen cooperation on tax matters and contribute to the domestic resource mobilisation efforts of developing countries.
- TIWB **facilitates well-targeted, specialized tax audit assistance in developing countries around the world.**
- Under TIWB tax audit experts work alongside local officials of developing country tax administrations on tax audit and tax audit-related issues.
- TIWB **aims to transfer technical know-how and skills to developing countries" tax auditors, as well as shared general audit practices**.

Houthis

- Yemen's Houthis have waded into the ongoing conflict in Palestine.
- The Houthis are **a large clan belonging to the Zaidi Shia sect, with roots in Yemen's northwestern Saada province.**
- The Houthi movement, **officially called Ansar Allah (Supporters of God), began in the 1990s against the dictatorship of Yemeni President Ali Abdullah Saleh.**
- Today, the Houthis are **one faction in a bloody civil war that has raged in Yemen since 2014.**
- They **currently control territory in the west and northwest of Yemen, including the capital Sana'a.**
- The Houthis, backed by Iran, are a part of what Iran calls**, "The Axis of Resistance" — an informal anti-Israel and anti-West political and military coalition that it leads.**
- Other **notable** groups in the Axis include Hezbollah and Hamas.
- In Yemen, the **Houthis are fighting against the Sunni-led internationally recognized Yemeni government, backed by Saudi Arabia and the UAE.**
- Experts see the civil war in Yemen as **a proxy war between Iran and Saudi, the two foremost Islamic powers in the world**

India Hands Over $ 2.5 Million to UNRWA For Palestinian Refugees.

- United Nations Relief and Works Agency for Palestinian Refugees in the Near East (UNRWA) is an UN agency that supports the relief and human development of Palestinian refugees.

Establishment:

- Following the 1948 Arab-Israeli war, UNRWA was established by United Nations General Assembly (UNGA) Resolution 302 (IV) of 8 December, 1949, to carry out direct relief and work programmes for Palestine refugees.
- The agency began operations on 1 May, 1950.
- In the absence of a solution to the Palestine refugee problem, the UNGA Assembly has repeatedly renewed UNRWA''s mandate, most recently extending it until 30 June, 2023.
- It is one of the largest United Nations programmes, with a population of approximately 5 million registered Palestine refugees under its mandate and over 30,000 staff.
- Fields of operations: It provides services in its five fields of operations: Jordan, Lebanon, Syria, the Gaza Strip and the West Bank, including the East of Jerusalem.
- UNRWA is unique in that it delivers services directly to its beneficiaries.
- Services provided: It encompasses education, health care, relief and social services, camp infrastructure and improvement, microfinance, and emergency assistance, including in times of armed conflict.

Funding:

- It is funded almost entirely by voluntary contributions from UN Member States.
- It also receives some funding from the Regular Budget of the United Nations, which is used mostly for international staffing costs.
- It reports only to the UNGA.
- Headquarters: It was originally headquartered in Beirut, Lebanon, but was moved to Vienna, Austria, in 1978. In 1996, the General Assembly moved the agency to the Gaza Strip to demonstrate the Assembly's commitment to the Arab-Israeli peace process.
- Its chief officer, the commissioner-general, the only leader of a UN agency to report directly to the General Assembly, is appointed by the UN secretary-general with the approval of an Advisory Commission.

US military aircraft wreckage found, five crew members confirmed deceased

CV-22B Osprey

- It is a **tiltrotor aircraft** that **combines the vertical take-off**, hover, and vertical landing **qualities of a helicopter with** the long-range, fuel **efficiency, and speed characteristics of** a **turboprop aircraft.**
- It was **developed to fulfil the needs of the U.S.** Marine Corps, U.S. Air Force and U.S. Navy operational requirements worldwide.
- It is **built by Boeing**, an American aerospace company.

- It is used for a wide-range of missions, including **long-range infiltration, exfiltration**, medium-range assault, **special operations**, **VIP transport,** resupply, **disaster relief,** search-and-rescue, medical evacuation, and humanitarian missions

Book Fair opens at the National Archives of India

National Archives of India (NAI)

- NAI is the **custodian of the records of enduring value** of the **Government of India.**
- **Established** on March 11, 1891, **at Calcutta (Kolkata)** as the Imperial Record Department, it is the **biggest archival repository in South Asia.**
- It was **transferred to New Delhi in 1911**.
- It functions as an **attached office of the Ministry of Culture**, Government of India.
- It has a vast corpus of records, viz., **public records, private papers, oriental records**, **cartographic records,** and **microfilms**, which constitute an invaluable source of information for scholars, administrators and users of archives.
- The **Director General of Archives**, heading the Department, has been **given the mandate for** the **implementation of the Public Records Act**, 1993, and the rules made there under, the **Public Records Rules, 1997, for the management**, administration, and preservation **of public records** in the Ministries, Departments, Public Sector undertakings, etc. of the Central Government.
- **Access to the records** in the NAI is **governed by** the provisions of the **Public Records Rules, 1997.**
- The NAI keeps and conserves **records of the government of India** and its organisations. It **does not receive classified documents**.
- **Abhilekh PATAL:**
  - The Abhilekh PATAL (**Portal for Access to Archives** and Learning) is an initiative of NAI to make its rich treasure of Indian archival records available **to all online**.
  - It is a **full-featured web portal to access the NIA's reference media and** its **digitised collections** through the internet.
  - It contains more than 2.7 million files held by the National Archives of India. The Digitized Collections contains over 71792 digitised records for online access.

Indian School Certificate Examinations (CISCE) has cancelled the compartment tests for the Class 12 board exams 2024.

Council for the Indian School Certificate Examination (CISCE):

- CISCE is a **privately held national-level board of school education** in India that **supervises and controls the Indian Certificate of Secondary Education (ICSE).**

- It was **established in 1958**. **Over 2,100 schools** in India and abroad are **affiliated to the CISCE.**
- It has been designed to **deliver an examination** in the course of general education t**hrough the medium of English**, in **accordance with the recommendations of the New Education Policy 1986.**
- CISCE **conducts three examinations**, namely, the Indian Certificate of Secondary Education (**ICSE –Class X**); The **Indian School Certificate (ISC - Class XII**) and the **Certificate in Vocational Education (CVE - Year 12).**
- The subject choices and syllabuses prescribed for these examinations are varied and aimed at nurturing the unique gifts of individual pupils.
- It **does not allow a private student to appear for the exam**, which has not been studying in ICSE affiliated school.
- The Council has been so **constituted as to secure suitable representation of: Government of India, State Governments/Union Territories** in which there are Schools affiliated to the Council, the **Inter-State Board for Anglo Indian Education**, the Association of Indian Universities, the Association of Heads of Anglo-Indian Schools, the Indian Public Schools' Conference, the Association of Schools for the ISC Examination and members co-opted by the Executive Committee of the Council.

Indira Gandhi Prize for Peace

The Indira Gandhi Prize for Peace, Disarmament and Development for 2023 has been awarded jointly to Daniel Barenboim and Ali Abu Awwad for their efforts in promoting peace and understanding between Israel and the Arab world.

- The joint awarding of the Indira Gandhi Prize for Peace, Disarmament and Development to Daniel Barenboim and Ali Abu Awwad is a recognition of their significant contributions to fostering peace and understanding in the Middle East, particularly in the context of the Israel-Palestine conflict.

Daniel Barenboim

- Barenboim is an internationally acclaimed classical pianist and conductor known for his performances with leading orchestras worldwide.
- His partnership with Palestinian literary scholar Edward Said influenced his vision for a peaceful resolution of the Israel-Palestinian conflict through respect, discourse, and dialogue.
- **He founded the West-Eastern Divan Orchestra and the Barenboim-Said Akademie to bring together youth from Israel, Palestine, and other Arab and North African countries**, fostering unity and understanding through music.
- He has received various awards, including the Great Cross of Merit of the Federal Republic of Germany, the Prince of Asturias Awards, and the Commander of the Legion of Honour.

Ali Abu Awwad

- Awwad is an eminent Palestinian peace activist dedicated to a non-violent resolution of the Israel-Palestine conflict.
- Born in 1972 into a politically active refugee family, Awwad''s commitment to non-violence was solidified during a 17-day hunger strike he and his mother undertook while he was in prison.
- **In 2014, Awwad co-founded Roots, a local Palestinian-Israeli initiative** promoting understanding, non-violence, and transformation.
- **Awwad''s peace-building efforts led to the creation of Taghyeer, a Palestinian non-violence movement launched by over 3,000 Palestinians in 2016**. It focuses on social development needs and advocates for a non-violent path to end the Occupation.
- He believes in non-violence as a means to practice humanity and achieve peace by accepting differences and respecting each other''s rights.

Indira Gandhi Peace Prize

- The Indira Gandhi Peace Prize, also known as the Indira Gandhi Prize for Peace, Disarmament and Development.
- It is a prestigious award given by the Indira Gandhi Memorial Trust every year to individuals or organisations that have made outstanding contributions to promoting international peace, development and a new international economic order; ensuring that scientific discoveries are used for the larger good of humanity, and enlarging the scope of freedom.
- **The prize was instituted in 1986** in memory of Indira Gandhi, the former Prime Minister of India, who was assassinated in 1984.
- The prize carries a cash award of 2.5 million Indian rupees and a citation.
- The panel constituted by the Indira Gandhi Memorial Trust consists of prominent national and international personalities including previous recipients. The recipients are chosen from a pool of national and international nominees.

Dr. Srinivas Naik Dharavath Honored with Visionary Leader Icon Award 2023 by AASRAA

- **Prestigious Recognition:**
  - Dr. Srinivas Naik Dharavath, Chairman of Real Vision Homes Pvt Ltd, receives the Visionary Leader Icon Award 2023 from AASRAA at the 5th National Summit in New Delhi.
- **Achievement in Real Estate:**
  - With over two decades of experience in real estate, Dr. Dharavath''s innovative ideas have transformed Real Vision Homes into a trusted player in the industry.

- **Leadership Beyond Business:**
  - The award acknowledges Dr. Srinivas Naik Dharavath"s leadership not only in business but also in social responsibility, highlighting his impact in steering Real Vision Homes towards success.
- **Real Vision Homes" Reputation:**
  - Real Vision Homes Pvt Ltd, established in 2019, is recognized as a dynamic and trustworthy real estate firm, specializing in various projects with a commitment to integrity and expertise.
- **AASRAA"s Role:**
  - AASRAA, founded by advocates nationwide in 2010, focuses on consumer welfare and rights, aligning with the shared values of ethical business practices and consumer rights championed by Real Vision Homes.
- **Social Responsibility Emphasis:**
  - The Visionary Leader Icon Award signifies the commitment of both AASRAA and Real Vision Homes to leaders who excel not only in business but also in social responsibility, emphasizing consumer rights and awareness.
- **5th National Summit Recognition:**
  - The award ceremony took place at the Constitution Club of India in New Delhi during the 5th National Summit, adding to the significance of the recognition.

Codex Alimentarius Commission Praises India's Standards on Millets

- India has **framed a comprehensive group standard for 15 types of millets** specifying 8 quality parameters, which received resounding applause at the international meet.
- India put forward a proposal for the development of global standards for millets, particularly for **Finger millet, Barnyard millet, Kodo millet, Proso millet and Little millet** as group standards as in the case of pulses.

Codex Alimentarius Commission

- It is **an international food safety and quality standard-setting body.**
- It was created by the **World Health Organisation** and **Food and Agriculture Organisation** of the United Nations in May 1963.
- **Objective:** Protecting consumer's health and ensuring fair practices in food trade.
- **Members:** It consists of **189 member countries.**
- Membership of the Commission is open to all Member Nations and Associate Members of FAO and WHO which are interested in international food standards.
- The Commission meets **in regular sessions once a year,** alternating between **Geneva and Rome.**
- **Funding:** The programme of work of the Commission is funded through the regular budgets of WHO and FAO, with all work subject to the approval of the two governing bodies of the parent organisations.
- The Commission **works in the six official languages of the UN.**
- Currently, it has standards for sorghum and pearl millet.

Millets

- These are a collective **group of small-seeded annual grasses** that are grown as grain crops, primarily on marginal land in dry areas of temperate, sub-tropical, and tropical regions.
- In India, millets can be clubbed into **major, minor, and pseudo categories.**
  - **Major Millets:** Sorghum (Jowar), Pearl Millet (Bajra), Finger Millet (Ragi/Mandua)
  - **Minor Millets:** Foxtail Millet (Kangani/Kakun), Proso Millet (Cheena), Kodo Millet, Barnyard Millet (Sawa/Sanwa/ Jhangora), Little Millet (Kutki)
  - Pseudo Millets: Buck-wheat (Kuttu) and Amaranth (Chaulai)
- **The top five states producing Millets:**are Rajasthan, Karnataka, Maharashtra, Uttar Pradesh, and Haryana.

NCOIS wave rider buoy washes ashore in Gopalpur

Buoy

- A buoy is a **floating object anchored at a definite location** to guide or **warn mariners**, to **mark the positions of submerged objects**, **or to moor vessels** in lieu of anchoring.
- Buoys are **often brightly coloured** and have distinctive shapes or patterns, making them **easily visible to ships** and other watercraft.
- Buoys are **commonly found in harbours and ports**, along coastlines, and in rivers and lakes.
- They are **maintained by** various **organisations, such as the Coast Guard** and other navigational authorities.
- **Buoyage system**:
  - For the sake of maintaining uniformity in buoyage systems worldwide, the **International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)** divided the world into two regions: Region A and Region B.
  - **Region A** includes Europe, Australia, New Zealand, Africa, the Gulf, and some Asian countries, whereas **Region B** comprises North, South, Central America, Japan, Korea, and the Philippines.
  - IALA proposed a system allowing the **use of lateral marks in each region**, but **in Region A**, the **colour red** of the lateral system **is used to mark the port side of channels** and the **colour green for the starboard side**.
  - **In Region B, the colours are reversed.**
- **Special-purpose buoys** are designed for a variety of uses; they include **cable buoys, anchor buoys, or race buoys.**
- A **mooring buoy** differs from other types in that it is not an aid to navigation but **a point to which vessels may be tied up.**

S*tarboard side and port side*

- The **port side is the ship's left side when looking forward towards the bow** of the ship.
- The **starboard is on the right side** of the ship when facing the bow.

- The **bow is** the **part of the ship** that is **generally most forward when the ship is moving**. The stern is the back of the ship or its aft-most part.

Depression, constipation, and urinary tract infections may precede MS diagnosis
Multiple Sclerosis:

- It is a long-lasting (**chronic) disease of**the **central nervous system.**
- In people with MS, the **immune system attacks** cells in the **myelin**, **the protective sheath that surrounds nerves** in the brain and spinal cord.
- Damage to the myelin sheath **interrupts nerve signals from your brain to other parts** of your body. The damage can lead to symptoms**affecting your brain, spinal cord, and eyes.**
- **Eventually**, the disease can **cause permanent damage** or deterioration **of the nerve fibres.**
- MS **affects women more than men**. The disorder is most commonly diagnosed between ages 20 to 40, but it can be seen at any age.
- There are **many possible causes** of MS, including:
  - **Autoimmune disorders**;
  - **Infectious agents**, such as viruses;
  - **Environmental factors**;
  - **Genetic** factors;
- **Signs and symptoms**:
  - It varies widely between patients and **depends on the location and severity of nerve fibre damage** in the central nervous system.
  - **Some** people **have mild symptoms**, **such as blurred vision, and numbness**, and tingling in the limbs.
  - **In severe cases**, a person may experience **paralysis, vision loss, and mobility problems.**
- **Treatment**: There''s **no cure** for multiple sclerosis. However, there are treatments to help speed the recovery from attacks, modify the course of the disease, **and manage symptoms.**

CDC probes cluster of ocular syphilis cases
Syphilis

- It is a **Sexually Transmitted Infection** (STI).
- It is caused **by the bacteria,** Treponema pallidum.
- After the infection happens, syphilis **bacteria can stay in the body for many years without causing symptoms.** But the infection **can become active again.**
- **Transmission**:
- Syphilis spreads from person to person through **direct contact with these sores.**
- It can also be **passed to a baby during pregnancy, childbirth** and sometimes through **breastfeeding**.

- Symptoms:

- Syphilis **develops in stages.** The symptoms **vary with each stage** and is often painless.
- During the **first stage, one or more sores develop** on the genitals, rectum, or mouth, and are often **painless**.
- During the **second stage,** people may **get a rash and experience flu-like symptoms,** such as fatigue, fever, a sore throat and muscles aches.
- **After the second stage**, the **symptoms** of syphilis **are hidden (latent stage**).
- **Without treatment,** syphilis **can damage the heart, brain, or other organs.** It can become life-threatening.
- **Treatment**: Syphilis is curable with quick diagnosis and treatment. It is **curable with the right antibiotics.**

Vaishali and Praggnanandhaa, first brother-sister duo to become Grandmasters: What is the chess title?

Chess Grandmaster title:

- Grandmaster **is the highest title** or ranking that a chess player can achieve.
- The Grandmaster title and other chess **titles is awarded by the International Chess Federation**, FIDE (acronym for its French name Fédération Internationale des Échecs),
- The title is the **badge of the game's super-elite**, recognition of the greatest chess talent on the planet, which has been tested and proven against a peer group of other similarly talented players in the world's toughest competitions.
- Besides Grandmaster, the Qualification Commission of FIDE recognises and awards seven other titles: International Master (IM), FIDE Master (FM), Candidate Master (CM), Woman Grandmaster (WGM), Woman International Master (WIM), Woman FIDE Master (WFM), and Woman Candidate Master (WCM) are also be given.
- All the titles, including **that of Grandmaster, are valid for life**, unless a player is stripped of the title for a proven offence such as cheating.
- **Revocation of title**
  - The "use of a FIDE title or rating **to subvert the ethical principles of the title** or rating system may subject a person to revocation of his title".
  - In case it is found after **a title has been awarded** that the player was in **breach of the Anti-Cheating Regulations** in one or more of the tournaments on which the title application was based, then the title may be removed by the Qualification Commission".

5-J SC Bench To Review Ruling On 'Automatic Vacation Of Stay'

Stay Order

- A "stay" or 'stay order' is defined as the **act of temporarily stopping or postponing any judicial proceedingthrough the court** or legal authorities in India to **secure the rights of a citizen.**
- It could **lead to the suspension of a case or** even the **suspension of any specific proceeding within** an ongoing **case.**

- So, **till a stay order is in effect**, the **operation of** the **Court's proceedings is made standstill**, and the party who seeks it can cause the operation of the other party (against whom the order is given) to cease.
- In the case of any key development that may require it, **a judge may decide to issue** a **stay order without** even **formally prompting the other party** or even a request being made to them in this regard.
- There are **two types** of stay orders: '**stay of proceedings' and 'stay of execution'**.
    - A **stay of proceedings** is issued by the court **in case there are parallel proceedings** that take place, **which may affect either one**.
    - A **stay of execution** refers to the **complete halting of the enforcement of a verdict** or judgement **against someone**, for example, when it is believed that a person is innocent and is given a pardon.
- This means that **stay orders can persist conditionally or even absolutely**.
- **The Supreme Court** on March 28, 2018, **passed several directions** with regard to stay orders, applicable to **both civil and criminal matters**, which are as follows:
    - In all pending cases where a stay is granted and is operating, the s**tay will come to an end on expiry of 6 months** from March 28, 2018, **unless, in exceptional cases, a speaking order extends the stay.**
    - In cases where the stay is granted in the future, e., after March 28, 2018, the stay order will expire 6 months from the date of such order, unless an order of extension is granted by a speaking order.
    - The **speaking order granting an extension must show that the case was of such an exceptional nature** that continuing the stay was more important than having the trial finalised.
    - The **trial court may fix a date not later than 6 months from the date of the stay order.**
    - **On the expiration** of the period **of 6 months,** the **trial court will resume the proceedings** without waiting for any other intimation unless an express order extending the stay is produced.

Rakesh Asthana, 6 others appointed NHRC special monitors

National Human Rights Commission (NHRC):

- It is a **statutory body** established in 1993, under the **Protection of Human Rights Act, 1993.**
- It is the **watchdog of human rights** in the country.
- It was established **in conformity with the Paris Principles (1991),** adopted at the first international workshop on national institutions **for the protection of human rights.**
- **Objectives**:
    - To **strengthen the institutional arrangements** through which human rights issues could be addressed in their entirety in a more focused manner.

- To **look into allegations of excesses**, **independently of the government**, in a manner that would underline the government's commitment to protect human rights.

- **Composition:**
  - It includes a **Chairperson and eight other members.**
  - The **Chairperson** of NHRC is **the retired Chief Justice of India**.
  - Out of the eight members, **four are full-time members,** whereas the other **four are deemed members.**
  - Out of the 4 **full time members of the NHRC**:
    - **One member** should be a **working or retired Judge of the Supreme Court**.
    - **Other member** should be **working or retired Chief Justice of a High Court.**
    - **Two members are** selected **based on their experience** and knowledge **of human rights.**
  - The **4 deemed members** of NHRC **are the Chairpersons of the National Commission for Minorities, the National Commission for Scheduled Castes, the National Commission for Scheduled Tribes and the National Commission for Women**.
  - The Chairperson and members are **appointed by the President on** the **recommendations of a six-member committee** consisting of –
    - **Prime Minister** as its head
    - **Speaker of the Lok Sabha**
    - **Deputy Chairman of** the **Rajya Sabha**
    - **Leaders of the Opposition in both the Houses** of Parliament
    - **Union Home Minister**
  - **Term**: The Chairperson and members are appointed for a **term of 3 years or till** the **age of 70 years**, whichever is earlier.
  - The chairperson and members are **eligible for reappointment.**
- **Functions of the NHRC:**
  - **Inquire, on its own initiative or on a petition** presented to it by a victim or any person on his behalf, **into a complaint of violation of human rights,** or abetment or **negligence in the prevention** of such **violation, by a public servant**;
  - **Intervene in** any proceeding involving any **allegation of violation of human rights pending before a court** with the approval of such court;
  - **Visit any jail or** any **other institution**under the control of the State Government, **where persons are detained** or lodged for purposes of treatment, reformation or protection **to study the living condition of the inmates and make recommendations** thereon;
  - **Spread human rights literacy**among various sections of society;
  - **Study treaties** and other international instruments **on human rights and make recommendations**for their effective implementation;
- **Powers:**

- While inquiring into complaints under the Act, the Commission shall **have all the powers of a civil court** trying a suit under the Code of Civil Procedure, 1908.
- It can **summon and enforce the attendance of witnesses** and **examine them on oath.**
- It can also**grant compensation to the victims of police brutality**.
- If necessary, the NHRC **can approach the Supreme Court or the High Court**for the **enforcement of human rights**in order to protect the rights of individuals or groups.
- The NHRC has the a**uthority to take "suo motu" cognizance of human rights violations**, even if a formal complaint has not been filed.

S. 34 IPC | Common Intention Doesn"t Mean Prior Agreement, It Can Be Formed Even A Minute Before The Incident: Supreme Court

Section 34 of the IPC

- Section 34 IPC states the **acts done by several persons in furtherance of common intention.**
- The section explains that "**When a criminal act is done by several persons in** furtherance of the **common intention of all**, **each** of such persons shall **be liable for that act** in the same manner **as if it were done by him alone**.
- This provision, which **creates 'joint culpability' for an act**, deviates from a basic concept of criminal law, which states that a person is only responsible for crimes committed by himself and not for the actions of others.
- Section 34 **does not state a specific offence**. It only lays down the rule of evidence that if two or more persons commit a crime in order of common intention, each of them will be held jointly liable.
- **The punishment** for this offence **will be consistent with the crime they committed**. For example, if the offence of murder has been committed in furtherance of a common purpose, each one of them will be held liable under Section 302 and Section 34 of the Indian Penal Code, 1860.
- Section 34 **helps in ascertaining individual accountability in cases** where it is **difficult to prove individual liability for activities done in support of the common objective of all** persons engaged **in a criminal act conducted by a group**.
- It is crucial to note that Article 34 **does not require each accused to actively participate in every aspect** of the criminal act. **As long as there is a shared intention** a**nd active participation in** the overall commission of the crime, each individual will be held equally responsible.
- For Article 34 to apply, the following **essential ingredients** must be present:
    - A criminal act committed by multiple people.
    - There must be a common intention of all to commit that criminal act. In reference to this principle, In the case of **Hari Om v. State of Uttar Pradesh**, it was held that "it is not necessary that there must be a prior

conspiracy or pre-meditation; the common intention can be formed in the course of the occurrence as well."

- **Active participation of each accused**: Each accused must have actively participated in the commission of the criminal act. A mere presence at the scene of the crime is not sufficient.

Panchayati Raj ministry launches Gram Manchitra app

Gram Manchitra application

- In order to encourage the **Spatial Planning** by **the Gram Panchayat**, **Ministry of Panchayati Raj** had launched the Geographic Information System (GIS) application "Gram Manchitra."
- This application facilitates and supports Gram Panchayats **to perform planning at Gram Panchayat** level using geo-spatial technology.
- It provides **a single/ unified Geo-Spatial platform** to better visualise the various developmental works to be taken up across the different sectors and provide a decision support system for the Gram **Panchayat Development Plan** (GPDP).
- Further, Ministry has **launched mActionSoft,** a **mobile based solution** to help in capturing photos with Geo-Tags (i.e. GPS Coordinates) for the works which have assets as an output.
- Geo-tagging of the assets is done in all three stages viz. (i) before the start of the work, (ii) during the work and (iii) on completion of work.
- This would provide a **repository of information on all works and assets** related to natural resource management, water harvesting, drought proofing, sanitation, agriculture, check dams and irrigation channels etc.
- Assets geo-**tagged using the m-ActionSoft application is available on Gram Manchitra**, enhancing the visualisation of various developmental works in the Gram Panchayats.
- The assets created under the finance commission funds are geotagged with the photographs of assets by the Panchayats.
- **Significance**
  - It will help Gram Panchayat officials **develop realistic and achievable development plans.**
  - These tools provide a decision support system in the preparation of development plans viz. **tools for identifying potential sites for development** projects, asset tracking, estimating the costs of projects, and assessing the impact of projects.

SC affirms "Group of Companies' doctrine in Indian arbitration jurisprudence

'Group of Companies' Doctrine

- The "group of companies" doctrine states that **a company that is a non-signatory to an arbitration agreement** would be **bound by the agreement if** such a company is a **member of the same group of companies that signed the agreement**.

- The doctrine **deems that the parties to the arbitration agreement mutually intended for such a non-signatory to be bound** by it.
- Arbitration is a mechanism to resolve disputes between parties without going to court. A neutral person is appointed to adjudicate the dispute, and the judgement of an arbitrator is **legally enforceable.**
- The "group of companies" concept, unlike other non-signatory theories that are based on domestic law principles, is based on international arbitration jurisprudence.
- The doctrine was **first recognised by the Indian Supreme Court in Chloro Controls India Private Limited v. Severn Trent Water Purification Inc.**(2013). Since then, Indian courts have applied the doctrine to bind group companies of signatories to arbitration agreements.
- The Supreme Court in ONGC Ltd. vs. Discovery Enterprises (P) Ltd. **came up with certain factors to be considered** in order to decide whether the Doctrine would find application or not, being:
  - the **mutual intent** of the parties
  - the **relationship of a non-signatory to a party which is a signatory** to the agreement
  - the **commonality of the subject-matter**
  - the **composite nature** of the transaction
  - the **performance of the contract**
- The **main purpose** behind bringing the "group of companies" doctrine in India **was to prevent fragmentation of disputes in composite transaction**s., disputes consisting of several parties and multiple contracts.
- **Recent Supreme Court Ruling:**
  - The Court held that it is **not necessary that only persons who are signatories** to the arbitration agreement will **be bound by the arbitration agreement**.
  - The requirement of a written arbitration agreement does not mean that non-signatories will not be bound by it, provided there is a defined legal relationship between the signatories and the non-signatories and that the parties intended to be bound by it by the act of conduct.
  - Non-signatories, by virtue of their relationship with the signatory parties and their commercial involvement in the subject matter, are not total strangers to the arbitration agreement.

Declaration of State emergency under Article 356 and subsequent actions of President should have reasonable nexus: SC

Article 356

- Article 356 of the Constitution of India is **based on Section 93 of the Government of India Act, 1935.**
- According to Article 356, **President"s Rule can be imposed on any state** of India on the **grounds of the failure of the constitutional machinery.**

- This is of **two types:**
  - If the **President receives a report from the state''s Governor or** is otherwise convinced **or satisfied that** the state''s situation is such that the **state government cannot carry on the governance according to** the provisions of the **Constitution.**
  - **Article 365**: As per this Article, President''s Rule can be imposed **if any state fails to comply with all directions given by the Union** on matters it is empowered to.
- In simple words, the President''s Rule is when the **state government is suspended and the central government directly administers** the state **through the** office of the **Governor** (centrally appointed).
- **Parliamentary approval is necessary** for the imposition of the President''s Rule in any state.
  - **The proclamation** of President''s Rule **should be approved in both Houses** of Parliament **within two months** of its issue. The approval is **by a simple majority.**
- The **President''s Rule is initially for** a period of **six months**. Later, it **can be extended for** a period of **three years with parliamentary approval, every six months**.
- The **44th Amendment** to the Constitution (1978) brought in some constraints on the imposition of the President''s Rule beyond a period of one year. It **says that President''s Rule cannot be extended beyond one year unless**:
  - There is a **national emergency in India.**
  - The **Election Commission of India certifies that it is necessary to continue** the President''s Rule in the state b**ecause of difficulties in conducting assembly elections** in the state.
- **What happens after the President''s Rule is imposed?**
  - The **governor carries on with the administration of the state** on behalf of the President. He or she **takes the help of the state''s Chief Secretary** and other advisors/administrators whom he or she can appoint.
  - The **President has the power to declare** that the **state legislature''s powers would be exercised by the Parliament.**
  - The state **legislative assembly would be either suspended or dissolved** by the President.
  - When the Parliament is not in session, the **President can promulgate ordinances with respect to the state''s administration.**
- **Revocation of the President''s Rule:**
  - President''s Rule **can be revoked any time** after such a proclamation has been made **by a subsequent proclamation** by the President.
  - A proclamation of revocation **does not require approval by Parliament.**

Revised versions of Criminal Bills

The revised versions of Bharatiya Nyaya Sanhita, Bharatiya Nagarik Suraksha Sanhita, and Bharatiya Sakshya Bill were reintroduced in Parliament after undergoing amendments suggested by the Parliamentary Standing Committee on Home Affairs.

- The Union Government introduced three Bills in Lok Sabha in August 2023, to replace the Indian Penal Code (IPC), 1860; the Code of Criminal Procedure, 1973 (originally enacted in 1898); and the Indian Evidence Act, 1872.
- The new Bills—Bharatiya Nyaya Sanhita (BNS), 2023, to replace the IPC; Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023, for CrPC; and Bharatiya Sakshya (BS) Bill, 2023, for the Indian Evidence Act—were subsequently referred to a standing committee the same day.
- The committee proposed several key changes to the Bills. Subsequently, the Centre re-introduced the revamped criminal law Bills in Parliament's winter session.
- These modifications aimed to address the committee''s concerns and improve the precision, fairness, and applicability of the laws concerning various criminal activities.

Changes made in the revised criminal reform bills

Handcuffs

- **Initial Proposal:** The Bharatiya Nagarik Suraksha Sanhita (BNSS) initially allowed the use of handcuffs during arrests for individuals accused of serious offences, including "economic offences."
- **Committee''s Recommendation:** The committee suggested restricting the use of handcuffs to select heinous crimes like rape and murder, excluding economic offences due to their varying severity. They recommended deleting "economic offences" from the clause.
- **Incorporated Change:** The revised bill deleted "economic offences" from the clause and made the use of handcuffs for offences against the state more discretionary. It also extended the use of handcuffs to individuals being produced before a court.

Mercy Petitions

- **Initial Provision:** The BNSS allowed convicts facing death sentences or their relatives to file mercy petitions, subject to review by the Centre or state government''s Home Department.
- **Committee''s Recommendation:** The committee proposed establishing a quasi-judicial board for mercy petitions and setting a timeframe for their review.
- **Incorporated Change:** The provision allowing mercy petitions to be forwarded for review was deleted. Additionally, the scope of non-appealable orders under Articles 72 and 161 was broadened, making the Governor''s orders under Article 161 unappealable.

Preventive Detention Powers

- **Initial Expansion:** The BNSS expanded police powers for preventive action without specifying a time frame for detention.
- **Committee''s Recommendation:** The committee suggested specifying a time period for detention and clarifying ambiguous language.
- **Incorporated Change:** The new bill includes a 24-hour limit for detention and clarifies the use of the term "Magistrate" instead of "judicial magistrate."

Community Service

- **Initial Provision:** "Community service" was included as a penalty for specific offences without a clear definition.

- **Committee''s Recommendation:** Define "community service" and extend its application to specific offences.
- **Incorporated Change:** The revised BNSS now defines "community service" as court-ordered work benefiting the community without remuneration. Additionally, community service was extended as a punishment for unlawfully engaging public servants in trade and non-appearance in response to a proclamation under Section 84.

The Bharatiya Nyaya Sanhita 2023

- It is a proposed bill aiming **to replace the Indian Penal Code of 1860**. This bill introduces several changes in criminal offences and punishments.
- It covers a wide range of aspects, including terrorism, organised crime, sexual offences, and more.

Key changes proposed in this bill include:

Sedition

- The Indian Penal Code (IPC) defines sedition as bringing or attempting to bring hatred or contempt, or exciting disaffection towards the government.
- **The Bill removes sedition as an offence and replaces it with penalties for activities such as exciting or attempting to excite secession, armed rebellion,** subversive activities, encouraging separatist feelings, or endangering the sovereignty or unity of India.
- Offences under the new provisions may result in imprisonment of up to seven years or life imprisonment, along with a fine.

Terrorism

- **The Bill defines terrorism** as acts intending to threaten the unity, integrity, and security of the country, intimidate the public, or disturb public order.
- Includes the use of firearms, bombs, hazardous substances, destroying property, disrupting essential services, and activities listed in the Unlawful Activities (Prevention) Act, 1967.
- Death or life imprisonment for acts resulting in death, imprisonment term between five years and life in other cases. Offenders may also face a fine of at least five lakh rupees.
- Conspiring, organizing, or assisting in preparing any terrorist act carries imprisonment between five years and life, along with a fine.

Organized Crime

- Continuing unlawful activities such as kidnapping, extortion, contract killing, land grabbing, financial scams, and cybercrime, carried out by violence or intimidation for material or financial benefit, by individuals or crime syndicates.
- Death or life imprisonment for offences resulting in death, imprisonment term between five years and life in other cases, along with a fine.

Petty Organized Crime

- Organized crimes cause general feelings of insecurity, committed by criminal groups/gangs, including pickpocketing, snatching, and theft.
- Attempting or committing petty organized crime is punishable with imprisonment between one and seven years and a fine.

Murder on Grounds of Caste or Race

- Murder committed by five or more people on specified grounds (race, caste, sex, place of birth, language, or personal belief) is punishable with imprisonment between seven years and life, or death, along with a fine.

Death Penalty for Gang Rape of Minors

- The bill extends the provision of the **death penalty for gang rape to include victims under 18 years of age**, broadening the scope beyond the previous provision which applied to victims below 12 years of age under the Indian Penal Code.

Sexual Intercourse by Deceitful Means

- This provision **criminalizes sexual intercourse with a woman through deceit or a false promise of marriage without intending to fulfil it.** The punishment could range from simple to rigorous imprisonment for up to 10 years, coupled with a fine.

Extending Offenses to Boys

- The Bill specifies that importing boys under the age of 18 years for illicit intercourse with another person will be an offence. This provision aligns the law with a gender-neutral approach concerning certain offences related to illicit activities involving minors.

The Bharatiya Nagarik Suraksha Sanhita 2023

- The new legislation **aims to replace the Code of Criminal Procedure, 1973.** The Bill preserves most of the provisions of the Code of Criminal Procedure, 1973, but also introduces some changes and reforms.
- The Code of Criminal Procedure, 1973 is the existing law that governs the process of arrest, trial, and bail for criminal offences under various laws such as the Indian Penal Code, 1860.

Key changes proposed under the bill include:

Detention of Undertrials

- Under the current Code, if an accused spends half of the maximum imprisonment period during investigation or trial, release on personal bond is mandated. The new bill modifies this, excluding release for offences punishable by life imprisonment or when facing multiple proceedings.
- **First-time offenders may secure bail after completing one-third of the maximum imprisonment for the offence**, necessitating an application by the jail superintendent.

Electronic Trials

- **The Bill proposes that legal proceedings, including trials and inquiries, can be conducted in electronic mode.** This means that court proceedings could take place through digital platforms or electronic communication systems.
- It allows for the production of electronic communication devices, such as mobile phones and computers, as potential sources of digital evidence during investigations or trials.

Medical Examination of Accused

- The existing legal framework allows the medical examination of accused individuals in specific cases, like rape, but limits the request for such examinations to at least a sub-inspector level police officer.

- The Bill suggests expanding this authority to any police officer, providing more flexibility in initiating medical examinations.

Forensic Investigation

- The Bill mandates **forensic investigation for offences carrying a minimum punishment of seven years of imprisonment.**
- It ensures that forensic experts visit crime scenes to collect evidence, and the entire process is documented using electronic devices. If a state lacks forensic facilities, it can utilize facilities in another state.

Prohibition of Carrying Arms

- The existing legal provision empowers District Magistrates to prohibit the carrying of arms in certain public situations for up to six months. The Bill proposes to omit this provision, possibly for reasons related to its non-notification or perceived redundancy.

Signatures, Finger Impressions, and Voice Samples

- The Bill expands the powers of Metropolitan/Judicial Magistrates to order the provision of not just specimen signatures and handwriting but also finger impressions and voice samples.
- Importantly, this can be done even for individuals who have not been arrested, broadening the scope of the magistrate''s authority.

Timelines for Procedures

- **The Bill introduces specific timelines for various legal procedures**, such as the submission of medical reports within seven days for cases involving rape victims.
- It sets timeframes for giving judgments, informing victims of investigation progress, and framing charges in session courts.

Trial in Absence of Offender

- The Bill allows for the **conduct of trials and pronouncement of judgments in the absence of a proclaimed offender.** This is applicable when the accused person has evaded trial, and there''s no immediate prospect of their arrest.

Metropolitan Magistrates

- The Bill omits the provision related to the notification of metropolitan areas and the appointment of Metropolitan Magistrates in cities or towns with a population exceeding one million. The reasons for this omission are not explicitly mentioned.

The Bhartiya Sakshya Bill 2023

- The proposal aimed at modernizing the rules governing the admissibility of evidence in legal proceedings in India. By repealing the Indian Evidence Act, 1872, it indicates an intent to update and adapt these rules to contemporary contexts.

Admissibility of electronic or digital records as evidence

- The bill aims to **update the definition of documentary evidence to include electronic or digital records**. It expands the scope to encompass information stored in various devices like smartphones, laptops, server logs, and even voice mails. This change essentially equates the legal effect of electronic records to that of paper records.

Oral evidence

- The proposed bill **extends the definition of oral evidence** to include information given electronically, acknowledging that statements made electronically can be considered as oral evidence.

Secondary evidence

- **The bill expands the definition of secondary evidence**. While primary evidence includes original documents and their electronic counterparts, secondary evidence now includes oral and written admissions, as well as the testimony of an expert in examining documents.
- It clarifies that secondary evidence might be necessary not only when the original document is inaccessible but also when the genuineness of the document is in question.

Production of documents

- The bill specifies that while witnesses summoned to produce documents must do so, the court will not demand privileged communications between Ministers and the President to be produced before it. This safeguards certain types of communications from mandatory production in court.

Joint trials

- In the context of joint trials involving multiple accused individuals, the **bill elaborates on the treatment of confessions made by one accused that implicate others.** It also clarifies that trials involving multiple individuals will still be considered joint trials even if one accused is absent or has not responded to an arrest warrant.

The success of these bills in achieving their intended outcomes will depend on effective implementation, ongoing evaluation, and responsiveness to emerging challenges. Public awareness and engagement will also play a crucial role in ensuring the success of these reforms.

Breached the Lok Sabha chamber

Following a recent incident where a visitor breached the Lok Sabha chamber, visitor entry has been put on hold without any official statement. This indicates increased security worries and possible future changes in the screening process.

Details

- The recent incident of someone jumping into the Lok Sabha chamber prompted the suspension of visitor entry, although no official communication about the suspension was made. The Opposition is demanding action regarding this security breach.
- This incident is likely to prompt a review of security measures and may lead to the strengthening of protocols to prevent similar breaches in the future. The suspension of visitor entry is a precautionary measure until further actions are taken to enhance security and ensure strict adherence to established protocols.

Rules for Admission of Visitors

Governing Rules

- **The admission, withdrawal, and removal of visitors are regulated by Rules 386 and 387 of the Rules of Procedure and Conduct of Business in the**

Lok Sabha. The Speaker has the authority to make orders regarding the admission of strangers during House sittings

Entry Process

- Members can apply for visitor cards for individuals they personally know. The member must provide a certificate asserting their relationship with the visitor and take full responsibility for them.

Pass Issuance

- **Visitor cards are usually issued for a specific day and fixed hours**. In exceptional cases, two cards can be issued. There''s a provision for same-day issuance under emergent situations with certain limitations.

Gallery Types

- **There are public and Speaker''s galleries in the Lok Sabha**. Members can facilitate entry for a limited number of individuals in each gallery. However, stricter vetting is required for the Speaker''s gallery.

Security Measures

- All visitors go through thorough security checks, including frisking using metal detectors. Visitor cards are cross-checked against approved lists.
- **Security staff within the galleries maintain a strict vigil to ensure visitors maintain decorum**. Guidelines outline specific protocols for behaviour within the gallery, including maintaining silence and not causing disturbances.

Conclusion

- The rules and security measures are in place to maintain order and prevent disruptions in parliamentary proceedings, and any breach of these rules is treated seriously.

Telangana''s Development Revolution: Key Points from Governor Tamilisai Soundararajan''s Strategic Plan

Decentralization Strategy:

- Governor Tamilisai Soundararajan unveils a strategic plan to decentralize development in Telangana.
- State to be partitioned into three zones for comprehensive growth.

- **Zoning Approach:**
  - First zone within the Outer Ring Road (ORR).
  - Second zone from ORR to the proposed Regional Ring Road (RRR).
  - Third zone covering areas beyond the RRR.
  - Aimed at distributing development efforts evenly across the state.
- **Hyderabad''s Central Role:**
  - Hyderabad positioned as the central hub.
  - Dual significance as an administrative hub and a crucial revenue source.
  - Acknowledges Congress-led governments for Hyderabad''s modern development.
- **Historical Successes:**

- Credits Congress-led governments for shaping Hyderabad''s modern landscape.
- Highlights achievements in IT sector, Metro Rail system, Shamshabad Airport, and the creation of the Outer Ring Road (ORR).
- Affirms dedication to reviving the untapped potential of the 2013 ITIR project.

- **Vision for Progress:**
  - Telangana government''s comprehensive action plan for development.
  - Initiative to clean the Musi River and transform its catchment area for employment opportunities.
  - Emphasis on restoring and surpassing Hyderabad''s former glory.
  - Goal of fostering development in all directions for multi-faceted city growth.
- **Government Commitment:**
  - Governor Tamilisai Soundararajan stresses the commitment of the current government to propel the city''s growth on multiple fronts.
  - Highlights plans for Musi River restoration and employment generation.
- **Transformative Journey:**
  - Telangana set to embark on a transformative journey with the ambitious decentralization plan.
  - Governor''s vision for even and comprehensive growth across the state.

SUVAS and SUPACE

The UK judiciary allows judges in England and Wales to use generative AI, for tasks such as text summarization, presentations, and emails.

- **The "Guidance for Judicial Office Holders" issued in the UK emphasizes the need for cautious use of AI tools** by judges, outlining potential risks and indications of AI-generated content in legal work.
- The document advises judges to be vigilant about signs suggesting the use of AI in legal arguments, such as unfamiliar case references, foreign citations, inconsistent legal submissions, American spellings, or persuasive yet erroneous content.

Potential Risks Associated with AI Use in Legal Practice

- **Lack of Authoritative Information:** Public AI chatbots may not retrieve answers from credible databases.
- **Algorithmic Text Generation:** AI tools produce text based on algorithms and training data, often predicting likely word combinations, potentially leading to inaccurate or biased output.
- **Quality of Information:** Information retrieved from AI tools might be incomplete, misleading, or biased, especially as current models are heavily influenced by US law.
- **Privacy Concerns:** Caution against entering private information into public AI chatbots due to data retention and sharing, suggesting the potential publication of inputted information.

- **Mitigation Strategies:** Suggestions include disabling chat history, limiting AI access to information, and reporting unintentional disclosures of private data.

Examples of Misuse in UK and US Cases

- Instances were cited where fabricated or fictitious legal arguments generated by AI were used in courts, leading to case rejections or sanctions against legal practitioners.

Indian Courts'' Engagement with AI:

- **Punjab & Haryana HC''s ChatGPT Inquiry:** Justice Anoop Chitkara sought ChatGPT''s response in a bail plea, emphasizing that any reference to ChatGPT aimed to illustrate bail jurisprudence but wasn''t considered conclusive.
- **Supreme Court''s AI Tools:** The Supreme Court of India developing tools like Supreme Court Vidhik Anuvaad Software (SUVAS) for language translation and the Supreme Court Portal for Assistance in Court's Efficiency (SUPACE) for collecting and presenting relevant legal information to judges.

Supreme Court Vidhik Anuvaad Software (SUVAS)

- An AI-powered platform for translating judicial documents between English and nine vernacular languages: Hindi, Marathi, Kannada, Tamil, Telugu, Punjabi, Gujarati, Malayalam, and Bengali.
- **Significance:**
- Promotes access to justice by bridging the language barrier for non-English speaking litigants and legal professionals.
- Enhances understanding of legal proceedings and empowers individuals to participate effectively.
- Reduces reliance on human translators, saving time and resources.
- Contributes to the preservation and dissemination of legal knowledge in various languages.

Supreme Court Portal for Assistance in Court's Efficiency (SUPACE)

- A comprehensive online platform providing judges with access to relevant legal information and tools to support their decision-making processes.
- **Features:**
- Case database with searchable judgments, orders, and precedents.
- Legal research tools for finding relevant statutes, rules, and commentary.
- Data analytics and visualization capabilities to identify trends and patterns in case law.
- Real-time case updates and notifications.
- **Significance:**

- Improves judicial efficiency by streamlining access to information and reducing time spent on research.
- Promotes consistency and predictability in judicial decisions by providing judges with a centralized repository of relevant precedents.
- Enhances transparency and accountability in the judicial process by making relevant information readily available to the public.

SUVAS and SUPACE aim to:

- **Bridge the digital divide and promote inclusivity:** Making legal information and processes accessible to a wider population regardless of language barriers or technological expertise.
- **Improve the quality of justice:** By providing judges with better tools for research and decision-making, these platforms can help ensure well-informed and consistent rulings.
- **Increase efficiency and transparency:** Streamlining processes and making information readily available can save time and resources, while also promoting public trust in the judiciary.

Challenges and Future Outlook

- Both initiatives face challenges like ensuring data accuracy, managing privacy concerns and adapting to technological advancements. However, their potential benefits are undeniable. With continued development and refinement, SUVAS and SUPACE can significantly contribute to a more efficient, accessible, and equitable Indian legal system.
- The guidance aims to ensure that while AI tools can be beneficial for certain tasks, they should be used judiciously, particularly in legal research and analysis, considering the potential implications on judicial decisions and the administration of justice.

Suspension of 78 Opposition MPs

The suspension of 78 Opposition MPs in a single day is a significant event in the Indian Parliament, and it highlights the ongoing challenges in maintaining order and decorum during legislative sessions.

Why were the MPs suspended?

- The **MPs were suspended for disrupting Parliamentary proceedings** during protests related to a security breach in the Parliament.
- In the Lok Sabha, the Opposition demanded a statement from Home Minister Amit Shah, waved placards, and some even climbed onto the Speaker's podium.
- In the Rajya Sabha, the Opposition raised slogans on the security breach, leading to disruptions.

Disruptions in Parliament can be attributed to various reasons:

- **Lack of time:** MPs may feel they have insufficient time to address important matters.

- **Unresponsive government:** When the government is perceived as unresponsive, MPs may resort to disruptive tactics.
- **Political or publicity purposes:** Some disruptions are deliberate and driven by parties seeking political or publicity gains.
- **Absence of prompt action:** If there"s a perception that disruptive MPs face no consequences, it can encourage such behaviour.

Who can suspend MPs? How?

- The Presiding Officer (Speaker in Lok Sabha, Chairman in Rajya Sabha) plays a crucial role in meting out suspensions.
- The process involves directing the MP to withdraw, naming the legislator if disruptions persist, and then moving a motion to suspend the MP until the end of the session.
- In 2001, the Lok Sabha empowered the Speaker to automatically suspend an MP for five days or the remaining part of the session without the need for a separate motion. However, this provision is not present in the Rajya Sabha.

How long can MPs be suspended for?

- MPs can be suspended for the remainder of the session, with a maximum period of five days (in Lok Sabha). The House can reinstate a suspended member at any point by passing a motion.

Is suspending MPs common practice?

- While it is not uncommon, the number of suspensions has increased in recent years. Since 2019, at least 149 suspensions have occurred, compared to 81 in 2014-19 and 36 in 2009-14.
- Disruptions in Parliament have been a long-standing issue, and efforts have been made to address the root causes.

Challenges in maintaining order

- Maintaining a balance between enforcing order and respecting democratic values is a challenge for Presiding Officers.
- Disruptions arising from frustration or planned parliamentary offences require different approaches, and finding long-term solutions is crucial for the smooth functioning of Parliament.

The suspension of MPs is a measure taken to address disruptions, but it also reflects broader challenges in the functioning of the Indian Parliament, including issues related to representation, responsiveness, and the need for procedural reforms.

LS Passes Bills to Replace British-Era Criminal Laws

- Lok Sabha (the Lower house of the Parliament of India) passed the ***Bharatiya Nyaya (Second) Sanhita (2023), the Bharatiya Nagarik Suraksha (Second) Sanhita (2023), and the Bharatiya Sakshya (Second) Bill (2023)*** to replace British-era criminal laws.
    - All three were discussed and passed with a voice-vote.

The Bharatiya Nyaya (Second) Sanhita Bill (BNSS):

- It replaced the Indian Penal Code (IPC), 1860, and it has 358 sections instead of 511 in the IPC.

- However, it retains most offences from the IPC, and adds community service as a form of punishment.

- **Sedition**: It is no longer an offence. Instead, there is a new offence for acts endangering the sovereignty, unity and integrity of India.
  - **Rajdroha**(sedition or offence against the government) has been replaced with **Deshdroha** (offence against the nation or country).
- **Terrorism:**It adds terrorism as an offence, and defines it as an act that intends to threaten the unity, integrity, security or economic security of the country, or strike terror in the people.
  - **Unlawful Activities (Prevention) Act, 1967 (UAPA)'s**definition of **'terrorist act'** adopted: **Section 113** of the revised Bill has modified the definition of the crime of terrorism to entirely adopt the existing definition under Section 15 of the UAPA.
- **Organised Crime:**It has been added as an offence. It includes crimes such as kidnapping, extortion and cyber-crime committed on behalf of a crime syndicate. Petty organised crime is also an offence now.

Issues and Analysis of BNSS:

- Age of criminal responsibility is retained at seven years. It extends to 12 years depending upon the maturity of the accused.
  - It may contravene recommendations of international conventions.
- BNSS defines **a child to mean a person below the age of 18**. However, for several offences, the age threshold of the victim for offences against children is not 18.
- BNSS removes sedition as an offence, but the provision on endangering the sovereignty, unity and integrity of India may have retained aspects of sedition.
- It retains the provisions of the IPC on rape and sexual harassment, and **does not consider recommendations of the Justice Verma Committee (2013)**such as making the offence of rape gender neutral and including marital rape as an offence.
- BNSS **omits Section 377 of IPC**which was read down by the Supreme Court.
  - It removes rape of men and bestiality as offences.

The Bharatiya Sakshya (Second) Bill (BSS):

- It replaced the **Indian Evidence Act (IEA), 1872,**by incorporating 170 sections and expanding the definition of documents **to include electronic records.**
  - However, it retains most provisions of the IEA including those on confessions, relevancy of facts, and burden of proof.
- The BSB expands **secondary evidence**to include oral and written admissions, and the **testimony of a person** who has examined the document and is skilled in the examination of documents.

– The **IEA** provides for **two kinds of evidence**: Documentary and Oral.
a. **Documentary evidence** includes primary (original documents) and secondary (that proves the contents of the original).
b. Under the IEA, **electronic records** are categorised as secondary evidence, but the BSB classified these **as primary evidence.**

Issues and Analysis of BSS:

- **Tempering of Electronic Records:**The Supreme Court has recognised that electronic records may be tampered with.
    - However, the BSB provides for the admissibility of such records, there are no safeguards to prevent the tampering and contamination of such records during the investigation process.
- **Incorporating the Law Commission Recommendations:**It has made several recommendations, including the presumption that the police officer caused the injuries if an accused was injured in police custody, which have not been incorporated.
- The IEA (and the BSB) allows **information to be admissible**if it was obtained when the **accused was in police custody**, but not if he was outside.
    - However, the Law Commission recommended to remove the above distinction.

The Bharatiya Nagarik Suraksha (Second) Sanhita Bill (BNSSS):

- It **replaced the Code of Criminal Procedure, 1898**, having 531 sections, and it enabled **Zero FIR nationwide**. It provides for the procedure for arrest, prosecution, and bail.
- **Use of Technology:**All trials, inquiries, and proceedings may be held in electronic mode. Production of electronic communication devices, likely to contain digital evidence, will be allowed for investigation, inquiry, or trial.
- **Forensic investigation:**Along with specimen signatures or handwriting, finger impressions and voice samples may be collected for investigation or proceedings.
    - Samples may be taken from a person who has not been arrested.
    - It mandates forensic investigation for offences punishable with seven years of imprisonment or more. Forensic experts visit crime scenes to collect forensic evidence and record the process.

Issues and Analysis:

- BNSSS allows up to **15 days of police custody**, which can be authorised in parts during the initial days period of judicial custody.
    - It **may lead to denial of bail**for the entire period if the police have not exhausted the 15 days custody.
    - Clause 187 of the BNSSS permits police custody of up to 90 days, as against the 15-day custody allowed till now. The law also prevents any third party from filing mercy petitions on behalf of convicts on death-row.
- The BNSSS denies this facility for anyone facing multiple charges. As many cases involve charges under multiple sections, it may limit such bail.
    - The CrPC provides for bail for an accused who has been detained for half the maximum imprisonment for the offence.
- The power to attach property from proceeds of crime **does not have safeguards provided in the Prevention of Money Laundering Act**.
- Recommendations of **high level committees**on changes to the CrPC such as reforms in sentencing guidelines and codifying rights of the accused have not been incorporated in the BNSSS.

Conclusion:

- These three Bills stressed justice rather than punishment, and have been designed to last for the next century, keeping technological advancements in mind. It is a pure Indian law after removing all the British imprints.
- Their significant impact on the criminal justice system, emphasising a shift towards a more humane approach. The laws prioritise justice, equality, and fairness, addressing loopholes in existing legislation.
    - The bills focus on transparency, accountability, and protecting the rights of victims and accused individuals.
- These bills use modern technology to streamline legal processes, and leverages to prevent the misuse of police powers, with compulsory video recording of evidence.

Supreme Court rules that tribunals cannot direct government to frame policy.

- The Supreme Court recently clarified that tribunals functioning under the strict parameters of their governing legislation cannot direct the government to make policy.
- Tribunals are judicial or quasi-judicial institutions established by law.
- They intend to provide a platform for faster adjudication as compared to traditional courts, as well as expertise on certain subject matters.

- It performs a number of functions, like adjudicating disputes, determining rights between contesting parties, making an administrative decision, reviewing an existing administrative decision, and so forth.
- Constitutional Recognition:
- The 42nd Amendment Act, 1976, inserted Articles 323-A and 323-B.
- Article 323A empowers Parliament to constitute administrative Tribunals (both at the central and state levels) for adjudication of matters related to the recruitment and conditions of service of public servants.
- Article 323B specifies certain subjects (such as taxation and land reforms) for which Parliament or state legislatures may constitute tribunals by enacting a law.

Composition of Tribunals:

- The presence of expert members (technical members) along with judicial members is a key feature of tribunals, which distinguishes them from traditional courts.
- The Supreme Court has noted that the members of a tribunal may be selected from departments of the central government as well as from various other fields of expertise.
- Only persons with a judicial background (such as judges of the High Court and lawyers with the prescribed experience who are eligible for appointment as High Court Judges) may be considered for appointment as Judicial Members.
- The Supreme Court specified that there is no need of a technical member if jurisdiction of courts is transferred to tribunals to achieve expeditious disposal of matters.

PM Garib Kalyan Anna Yojana: Cabinet extends free foodgrain scheme for five years

Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY)

- It **was launched** by the Indian government **in April 2020 as a response to the COVID-19 pandemic.**
- It is designed to provide **financial assistance to** economically **weaker sections affected by the pandemic**.
- The scheme encompasses the distribution of **5 kg of free food grains each month**, **along with cash transfers to women and elderly individuals.**
- It was **introduced as part of the broader Pradhan Mantri Garib Kalyan Package**, aiming to offer relief to those adversely affected by the pandemic, especially the poor and marginalised.
- As per the scheme, the government offers 5 **kg of free food grains each month in addition to the subsidised ration** given **to families covered** by the Public Distribution System **under the National Food Security Act.**

- **Eligibility Criteria**: The benefits of PMGKAY are accessible to families meeting specific eligibility criteria.
  - **Families belonging to the Antyodaya Anna Yojana (AAY) and Priority Households** (PHH) categories will be eligible for the scheme. **PHH** is to be i**dentified by State Governments**/Union Territory Administrations **as per criteria evolved by them. AAY families** are to be **identified by States/**UTs **as per the criteria prescribed by** the **Central Government**:
  - **Households headed by widows, or terminally ill persons, or disabled persons, or persons aged 60 years** or more **with no assured means of subsistence** or societal support.
  - **Widows, or terminally ill persons, or disabled persons,** or persons aged 60 years or more **or single women or single men with no family or societal support** or assured means of subsistence.
  - Additionally, **all primitive tribal households, landless agricultural labourers**, marginal farmers, rural artisans/craftsmen such as potters, tanners, slum dwellers, and **persons earning their livelihood on a daily basis in the informal sector like porters, coolies,** rickshaw pullers, hand cart pullers, and other similar categories in both rural and urban areas are **also eligible for the scheme**.
  - **All the citizens** are eligible **who belong to Below Poverty Line families.**

Dharmendra urges Naveen to implement PM-USHA in state

Pradhan Mantri Uchchatar Shiksha Abhiyan (PM-USHA)

- It was launched in **2013 as a centrally sponsored programme** to improve access, equity, and quality in higher education through the planned development of **higher education at the state level.**
- It aims to work with **300-plus state universities** and their affiliated colleges.
- **Objectives:**
  - creating new academic institutions,
  - expanding and upgrading the existing ones,
  - developing institutions that are self-reliant in terms of quality education, professionally managed, and characterised by a greater inclination towards research.
- **Funding:**
  - It aims at providing strategic funding to eligible state higher educational institutions.
  - The central funding is based on norms and is outcome-dependent.
  - Funds flow from the central ministry through the state governments/union territories before reaching the identified institutions.

- Funding to states would be made on the basis of the critical appraisal of State Higher Education Plans, which would enlist each state's strategy to address issues of equity, access, and excellence in higher education.

- PM-USHA places greater emphasis on the improvement of the quality of teaching and learning processes in order to produce employable and competitive graduates, postgraduates and PhDs.
- The programme focuses on state higher educational institutions and draws upon the best practices from colleges and universities across the nation.

Odisha invokes ESMA to ban strikes by Health Department staff

Essential Services Maintenance Act (ESMA)

- It is an act of the Indian Parliament enacted in **1968** to assure the supply of certain services that, if impeded, would harm people's daily lives.
- It is enforced to **prohibit striking employees** from refusing to work in certain essential services. Employees cannot cite bandhs or a curfew as an excuse not to report to work.
- **Which services fall under this category?**
  - Services relating to **public conservation, sanitation, water supply, hospitals, or national defence** are essential.
  - Any establishment involved in producing, delivering, or distributing **petroleum, coal, electricity, steel, or fertiliser** also gets classified as providing essential services. Aside from that, any **banking-related** service may be subject to ESMA.
  - This statute also applies to **communication and transportation services** and any government initiative relating to the acquisition and distribution of food grains.
- State governments, acting alone or collaborating with other state governments, can enforce their respective acts in specified territories.
- **Each state has its own ESMA,** with provisions that differ slightly from the federal statute.
- As a result, if the nature of the strike disturbs only one or more states, the states can initiate it.
- **The Act also allows states** to choose the essential services on which to enforce ESMA.
- In a nationwide interruption, particularly involving **railways,** the central government may activate the ESMA.
- **What actions can be taken against the employees?**
  - Persons who commence the strike as well as those who instigate it are liable to disciplinary action, which may include dismissal.
  - As the **strike becomes illegal** after ESMA is invoked, **legal action** can also be taken against these employees.

- Any police officer is empowered to arrest the striking person without a warrant.
- Persons participating in or instigating the strike are **punishable with imprisonment,** which may extend to one year, or with fine, or with both.

Youth for Unnati and Vikas with AI (YUVAi) to be featured in GPAI Summit 2023

YUVAi Initiative

- It is a collaborative initiative of **National e-Governance Division** (NeGD), Ministry of Electronics & Information Technology (MeitY), Government of India and **Intel India.**
- This programme, designed to equip the **youth with essential Artificial Intelligence skills**, has garnered attention for its innovative approach and commitment to enabling a future-ready workforce.
- It is aimed to foster a deeper understanding of AI, to enable school **students from class 8 to 12 across the nation** with AI skills and empower them to become human-centric designers and users of AI.
- **Key Updates and Features of YUVAi Programme:**
  - Progressing in **three phases,** the YUVAi programme is being implemented in multiple cohorts to ensure that maximum students stand a chance to become future-ready. It introduces students to several social themes to direct their AI knowledge towards solving real-world problems.
  - In the **first Cohort**, more than 8,500 students registered, post which, they attended online orientation sessions to learn fundamental concepts of AI. Teachers also enrolled into the program and underwent orientation sessions. Students then submitted innovative AI-based ideas under one of the eight core themes of the programme.
  - In **phase 2**, Top 200 AI-based ideas were shortlisted. Shortlisted students attended **online deep dive AI training** and mentorship sessions with certified Intel AI coaches and experts – helping students enhance their solutions. Students then submitted their AI projects to be evaluated for Phase 3.
  - In **Phase 3,** top 50 students were shortlisted and they were invited to attend a four-day **face-to-face rapid modeling workshop** – receiving one-on-one mentorship, apprenticeship and guidance from industry experts to fine-tune their projects and develop them into prototypes.
  - An on-spot project presentation was conducted by a multiple jury panel to shortlist Top 10 students.

21.15 lakh applications received under PM Vishwakarma Scheme, says Skill Ministry

PM Vishwakarma Scheme:

- This is a **central sector scheme** launched **by the Ministry of Micro, Small, and Medium Enterprises**, which offers services like **market linkage support, skill training, and incentives for digital transactions to artisans and craftspeople** engaged in specified trades.
- **Time period: Five years** (FY 2023-24 to FY 2027-28).
- **Aim**:
  - To s**trengthen and nurture** the Guru-Shishya parampara, or **family-based practice of traditional skills** by artisans and craftspeople working with their hands and tools.
  - The scheme also aims at **improving the quality** as well as the **reach of the products and services of artisans** and craftspeople and to ensure that the Vishwakarmas are **integrated with the domestic and global value chains.**
- **Eligibility & coverage:**
  - It is available for **rural and urban artisans and craftsmen** across India.
  - It covers 1**8 traditional crafts such as Boat Maker; Armourer; Blacksmith**; Hammer and Tool Kit Maker; etc.
  - Five lakh families will be covered in the first year and **30 lakh families over five years.**
- **Benefits**:
  - Under this scheme, the artisans and craftspeople will be **provided recognition through a PM Vishwakarma certificate and ID card.**
  - They will **receive collateral-free credit support of up to ₹1 lakh** (first tranche) **and ₹2 lakh (second tranche) with a concessional interest rate of 5%.**
  - The scheme will **further provide** craftsmen with methods of **skill upgradation involving basic and advanced training**, a t**oolkit incentive of ₹15,000** and **incentives for digital transactions,** and **marketing support.**
  - Under the scheme, there will be two types of skilling programmes - **Basic and Advanced** and a **stipend of Rs 500 per day** will also be provided to beneficiaries while undergoing skills training.

Indian Parliament Approves Sammakka Sarakka Central Tribal University

- **Landmark Decision:**
  - Indian Parliament gives approval for the establishment of Sammakka Sarakka Central Tribal University in Telangana.
  - The decision is part of The Central Universities (Amendment) Bill, 2023.
- **Legislative Process:**
  - The Bill successfully passes through the Rajya Sabha and Lok Sabha.
  - Unexpected security breach in Lok Sabha leads to opposition walk-out.
  - Despite disruption, the Bill moves forward with a voice vote, highlighting commitment to educational initiatives.
- **Context and Obligations:**
  - Central tribal university in Telangana mandated by the Andhra Pradesh Reorganisation Act, 2014.

- Union Education Minister Dharmendra Pradhan emphasizes government''s commitment to fulfilling statutory obligations and addressing tribal communities'' educational needs.

- **Security Breach Concerns:**
  - Opposition demands a statement from Home Minister Amit Shah regarding the security breach.
  - Despite concerns, the legislative process continues, showcasing a shared commitment to advancing education.
- **Insights into Student Dropout Rates:**
  - Discussion focuses on student dropout rates, especially among marginalized communities.
  - Minister Pradhan explains that students from SC, ST, and OBC often explore better opportunities elsewhere, impacting perceived dropout rates.
- **Data-Driven Clarity:**
  - Minister Pradhan presents data on the growth in overall enrolment in Indian Institutes of Technology (IITs) over the past five years.
  - Figures indicate a positive trajectory, dispelling misconceptions about a decline.
  - Low dropout rates for students from diverse communities, including OBC, SC, and ST, are highlighted.
- **Government's Commitment to Inclusive Education:**
  - Minister Pradhan reaffirms the government''s unwavering commitment to inclusive education.
  - Emphasis on continuous efforts to enhance higher education, ensuring students from all backgrounds have access to quality learning opportunities.

Rail Kaushal Vikas Yojana (RKVY)

The Railway Minister clarified that the approximately 26,000 individuals who underwent training through the "Rail Kaushal Vikas Yojana" until November 2023 would not be given priority for employment within the Indian Railways.

Rail Kaushal Vikas Yojana (RKVY)

- The Rail Kaushal Vikas Yojana (RKVY) is a **skill development initiative launched by the Ministry of Railways in collaboration with the National Skill Development Corporation (NSDC) and the Sector Skill Councils (SSCs).**
- RKVY is aligned with the National Skill Qualification Framework (NSQF) and follows the standards and guidelines of the National Skill Development Agency (NSDA).

RKVY has three components

Recognition of Prior Learning (RPL)

- This component involves the assessment and certification of existing skills and competencies of railway employees based on their work experience and performance.

- RPL helps in **validating and recognizing the skills acquired through informal or non-formal learning.** RPL also helps in identifying the skill gaps and training needs of the employees.

Short Term Training (STT)

- This component involves the provision of short-term training courses to railway employees to bridge the skill gaps and upgrade their skills.
- STT courses are designed and delivered by NSDC-approved training partners in accordance with the National Occupational Standards (NOS) and Qualification Packs (QPs) developed by the SSCs. STT courses are conducted at railway premises or nearby locations for the convenience of the employees.

Train the Trainer (TTT)

- This component involves the training and certification of railway trainers and assessors who can conduct RPL and STT for other railway employees.
- TTT courses are conducted by NSDC-approved master trainers who have expertise in pedagogy, assessment and quality assurance. TTT courses are also aligned with the NOS and QPs of the respective trades and skills.

Key points about the Rail Kaushal Vikas Yojana:

Objective

- The primary goal is skill enhancement. It **aims to equip young individuals with technical skills that are in demand across different industries**, thereby increasing their chances of employability or enabling them to start their businesses.

Training Focus

- The program provides entry-level skill training in diverse technical trades. Candidates undergo training in specific trades and receive certificates upon successful completion of the program.

Youth Empowerment

- The initiative is aimed at empowering unemployed youths by enhancing their skills, which can lead to better employment opportunities or encourage them to venture into entrepreneurship.

No Guarantee for Railway Jobs

- One crucial aspect highlighted by the Railway Minister is that completing this program does not assure candidates preferential treatment or job placements within the Indian Railways. The focus of the program is on skill development rather than guaranteeing employment within the railway sector.

Entrepreneurship Promotion

- Besides enhancing employability, **the program encourages candidates to consider starting their own ventures or entrepreneurial initiatives.** This could include using the acquired skills to create small businesses or startups.

Lack of State-wise Data

- The Indian Railways does not maintain state-wise data of candidates enrolled in the Rail Kaushal Vikas Yojana. This indicates a broader approach aimed at skill development for youths across the country without focusing on specific regional statistics.

Overall Impact

- The initiative aims to contribute to the broader goal of skill development in India"s youth population. By enhancing skills and promoting entrepreneurship, it seeks to create a more capable and job-ready workforce.
- The Rail Kaushal Vikas Yojana serves as a valuable initiative to empower young individuals by providing technical skills and certificates, its primary focus is on skill enhancement and fostering an entrepreneurial spirit rather than guaranteeing job placements within the Indian Railways. The aim is to equip the youth with skills that make them more employable across various industries or enable them to create their pathways in the job market.

Viksit Bharat Sankalp Yatra

The "Viksit Bharat Sankalp Yatra" is a nationwide campaign launched by the Government of India to promote the development and progress of the country.

Viksit Bharat Sankalp Yatra

- It is a government initiative **aimed at raising awareness about and monitoring the implementation of various flagship central schemes across India**. These schemes include Ayushman Bharat, Ujjwala Yojana, PM Suraksha Bima, PM SVANidhi, and others.
- The program is a collaborative effort involving various Union ministries and state governments.
- It was flagged off by the Prime Minister on December 16, with the initial launch in Rajasthan, Madhya Pradesh, Chhattisgarh, Telangana, and Mizoram—states where recent Assembly polls were held.
- The Yatra had started earlier in other states but was delayed in these five states due to the Model Code of Conduct being in place before the elections.
- The Yatra began on November 15 from Khunti, Jharkhand. In just one month, it reached over 2.50 crore citizens across 68,000 Gram Panchayats in the country.

The program has four primary objectives:

- **Reaching out to the vulnerable:** The Yatra aims to identify and connect with individuals who are eligible for various government schemes but have not yet availed of the benefits.

- **Dissemination of information and generating awareness:** The initiative focuses on spreading information about government schemes and creating awareness among the public.
- **Interaction with beneficiaries through personal stories/experience sharing:** The Yatra involves engaging with beneficiaries of government schemes, allowing them to share their personal stories and experiences with the implemented programs.
- **Enrollment of potential beneficiaries:** During the Yatra, efforts are made to enrol potential beneficiaries by collecting details and information from participants.

The "Viksit Bharat Sankalp Yatra" is a unique opportunity for the people of India to witness and celebrate the development and progress of their country. It serves as a platform for expressing aspirations and expectations for the future, reflecting the collective resolve and commitment of the people to make India a developed, empowered, and self-reliant nation.

Bharat New Car Assessment Programme (Bharat NCAP)

The inaugural round of car crash tests under the Bharat New Car Assessment Programme (Bharat NCAP) has been completed. This initiative marks a crucial step towards enhancing vehicle safety in India.

Key points

- Major original equipment manufacturers (OEMs) such as Maruti Suzuki India, Tata Motors, and Kia India had their car models included in the initial batch of vehicles tested.
- This **voluntary program, officially initiated by the Union government, focuses on vehicles falling within the M1 category, with a gross weight of 3,500kg or less**. This category encompasses passenger vehicles with up to eight seats, excluding the driver"s seat.
- Bharat NCAP mandates testing the base variant of any given model across three crucial safety domains: adult occupant protection, child occupant protection, and safety assist technologies.
- Cars underwent a series of crash tests, including an offset deformable barrier frontal impact test at 64 kmph, a side impact test at 50 kmph, and a pole side impact test at 29 kmph. The results are used to rate the cars on a scale of zero to five stars, reflecting their safety performance.

The impending release of the crash test results holds substantial importance, as it will provide consumers with valuable insights into the safety standards of these vehicles. Furthermore, this initiative could potentially incentivize manufacturers to prioritize and enhance vehicle safety features in their upcoming models.

Logistics Ease Across Different States (LEADS) perception survey

The Logistics Ease Across Different States (LEADS) perception survey conducted by the Union Ministry of Commerce and Industry sheds light on the logistics challenges faced by Indian states and their performance in this crucial aspect.

Key points from the Survey

Landlocked States

- **Improvement in Scores:** The survey indicates that landlocked states have shown improvement in average scores across various parameters, including the quality of roads, terminals, cost of logistics, and availability of skilled workforce, compared to 2019.
- **Concentration of Exports:** Despite improvements, only five states—Gujarat, Tamil Nadu, Karnataka, Maharashtra, and Telangana—contribute to 70% of the country''s exports. This concentration has led to a widening gap in income and job generation between landlocked and coastal states.
- **Challenges in Certain States:** Bihar, Himachal Pradesh, Jharkhand, and Chhattisgarh received low perception scores on road and terminal quality. Jharkhand, in particular, scored below average across all indicators, including infrastructure, services, and regulatory categories.

North-East Group

- **Contribution to GDP:** The North Eastern states contribute 2.8% to India''s GDP, requiring significant logistics-related improvements. The survey notes a marked improvement in all parameters compared to the 2019 survey.
- **State-Specific Challenges:** Manipur faces lower-than-average user satisfaction levels across various indicators. Assam performed better than average, but Meghalaya''s user performance assessment was below the North-East Group average.

Coastal States

- **Export Contribution:** Indian coastal states contribute significantly to exports, with Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Odisha, Tamil Nadu, and West Bengal accounting for 75% of total exports.
- **Performance Lags:** The survey reveals that Goa, Odisha, and West Bengal continue to perform below the average among coastal states. Despite improvement in Odisha''s overall logistics perception since 2019, the indicator averages remain below the Coastal Group average.

Overall Implications

- **Competitiveness Concerns:** Improved logistics competitiveness is crucial for India to compete with countries like Vietnam and Indonesia. Despite increased infrastructure spending, deep-seated logistical issues continue to affect Indian manufacturing and export efforts.
- **Regional Disparities:** The concentration of exports in a few states and disparities in logistics performance among landlocked and coastal states highlight the need for a more balanced and inclusive approach to logistics development.

The survey underscores the significance of logistics efficiency in bolstering India''s competitiveness, particularly as it aims to position itself as a viable alternative to manufacturing hubs like China. Addressing these challenges, especially in

infrastructure and regional disparities, will be pivotal for the country''s economic growth and export performance.

BISAG-N

- **Ministry:** MeitY, Government of India. (Indian Bureau of Mines)
- At present, **BISAG** is a state agency of the Department of Science and Technology Government of Gujarat, located at Gandhinagar, Gujarat.
- Bhaskaracharya National Institute for Space Applications and Geo-informatics [BISAG (N)] is an Autonomous Scientific Society registered under the Societies Registration Act, of 1860.
- **Objective:** to undertake technology development & and management, research & and development, facilitate National and international cooperation, capacity building and support technology transfer & and entrepreneurship development in the area of geo-spatial technology.
- BISAG has implemented GIS and geospatial technologies for major Ministries and almost all States.
- For this purpose, geo-spatial science (GIS Remote Sensing, Image Processing, Photogrammetry, GPS, Cell Phone etc.), Information Science Systems (MIS, Database, ERP, Project Management, Web, Artificial Intelligence etc.) and Mathematics Science Systems (Geometry, Fluid, Mechanics, Trigonometry, Algebra etc.) have been integrated in-house by BISAG.

Sahitya Akademi Awards for 2023

- **Nine books of poetry, six novels, five short story collections, three essays and one literary study** have won the Sahitya Akademi Awards this year.
- Tamil author **Rajasekaran** has been chosen for his novel **Neervazhi Padooum, Telugu writer Patanjali Sastry** for his short story collection and **Malayalam litterateur,EV Ramakrishnan** for his literary study **Malayala Novelinte Deshakalangal.**
- The authors who will receive the honour for their poetry collections include **Vijay Verma in Dogri, Vinod Joshi in Gujarati, and Ashutosh Parida in Odia.**
- The authors who have been chosen for their short stories include **Pranavjyoti Deka in Assamese, Nandeswar Daimary in Bodo, and Taraceen Baskey in Santali.**
- **Sanjeev** will get Sahitya Akademi Award for his Hindi novel Mujhe Pahachaano and Neelam Saran Gour will get the award for her English Novel Requiem in Raga Janki.
- The award, in the form of a **casket containing an engraved copper plaque, a shawl, and one lakh rupees**.
- The Award will be presented at the award presentation function on **12th March next year.**

Sahitya Akademi awards:-

- **Established: 12 March 1954.**
- **Given By: Sahitya Akademi, Government of India.**
- Sahitya Akademi Award is a literary honour that is **conferred annually.**

- It was the **First Time Conferred in 1955.**
- It is awarded in **Languages**
- The Award is presented to the **most outstanding books of literary merit published** in any of the twenty-four major Indian languages recognized by the Akademi **(including English).**
- Sahitya Akademi Award is the **second highest literary honour** by the Government of India, **after the Jananpith award.**

Decoration:-

- The Award in the form of an engraved **copper-plaque, and a cash prize of Rs. 1,00,000/-**

Eligibility:-

- The author must be of **Indian Nationality.**

Selection process:-

- For the main award/ Bhasha Samman conducted through a rigorous and confidential process overseen by experts – the body comprises one writer chosen from each of the 24 regional languages.
- Each member suggests 200 names, following which an expert committee finalises 50 in phase one → 5 in the next phase and finally, one of the five is shortlisted.

Public Accounts Committee (PAC) Report on Agriculture Insurance Schemes

- The Public Accounts Committee (PAC) in its 78th Report, raised concerns regarding failure of Agricultural Insurance Company of India Ltd (AIC) to comply with the guidelines under National Agricultural Insurance Scheme (NAIS).

Concerns raised by PAC report

- According to the PAC report the NAIS guidelines provided that Insurance Agency (AIC) is responsible for arranging re-insurance support for the **entire scheme claims under NAIS.**
- However AIC had arranged re-insurance support only for its own share of claims under NAIS and did not arrange for the share of claims to be borne by Central and the State governments.
- Delay in the release of funds by the state governments towards share in premium subsidy observed.
- The coverage of farmers in the country as well as in the nine selected States under the erstwhile schemes was very low compared to their population.

What is Reinsurance?

- Reinsurance, referred to as "**insurance for insurance companies".** It is a contract between a reinsurer and an insurer.

- In this contract, the insurance company—the cedent—transfers risk to the reinsurance company, and the latter assumes all or part of one or more insurance policies issued by the cedent.

History of Crop Insurance Schemes

- The Centre introduced the **Comprehensive Crop Insurance Scheme (CCIS)**in 1985. Later the CCIS was replaced by **NAIS** from 1999-2000.
- From 2010-11, Modified National Agricultural Insurance Scheme (MNAIS) was introduced in 50 districts as pilot.
- In 2013-14, MNAIS was merged with Weather Based Crop Insurance Scheme (WBCIS) and a new **National Crop Insurance Programme (NCIP)**
- However, NAIS was allowed to be continued in some States, until 2015-16.
- From 2015-16 Kharif season, the Centre introduced the flagship Pradhan Mantri Fasal Bima Yojana (PMFBY).

Recommendations

- The report emphasizes the need for devising a robust compliance mechanism and timely release of funds.
- The factors attributable for the poor performance of the schemes are required to be identified and appropriately addressed.
- Integrate the database of different schemes for efficient and fast implementation of insurance schemes.

Public Accounts Committee

– The committee was set up first in **1921** under the provisions of the **Government of India Act of 1919.**
– It consists of **22 members,** 15 from the Lok Sabha and 7 from the Rajya Sabha.
– The members are elected by the Parliament every year from amongst its members according to the **principle of proportional representation** by means of the single transferable vote.
– A **minister cannot be elected as a member** of the committee. The term of office of the members is **one year.**
– **The function** of the committee is to examine the annual audit reports of

the Comptroller and Auditor General of India (CAG), which are laid before the Parliament by the President.

Pradhan Mantri Bhartiya Janaushadhi Pariyojana

- **Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP**) achieved their target of Rs. 1000 Crore in sales of generic medicines in FY 2023-24.
- It was launched in **2008**by the **Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers** under the name **Jan Aushadi Campaign.**
- **Aim:**To provide quality medicines at affordable prices to the masses.
- **Jan Aushadhi Stores:**The initiative involves the establishment of Jan Aushadhi Kendras, or Jan Aushadhi Stores, which serve as retail outlets for the distribution of generic medicines.
- **Progress Made:**There has been **more than 100 times growth** in the number of Kendras since the scheme has been launched covering almost all the districts of the country.
    - The Government launched the 10,000th Janaushadhi Kendra at AIIMS, Jharkhand in 2023.
    - Accordingly, the Government has set a target to open 25,000 Janaushadhi Kendras across the country by March, 2026.

PM-AJAY For Upliftment of SC Community

Pradhan Mantri Anusuchit Jaati Abhyuday Yojana is a 100% Centrally Sponsored Scheme for the welfare of Scheduled Caste (SC) population.

- **Launched in** – 2021-22.
- **Launched by** – Ministry of Social Justice & Empowerment.
- It has been framed after merging the 3 erstwhile schemes
    - Pradhan Mantri Adarsh Gram Yojana (PMAGY)
    - Special Central Assistance to Scheduled Caste Sub Plan (SCA to SCSP)
    - Babu Jagjivan Ram Chatrawas Yojana (BJRCY)
- **Objectives**
    - To **increase the income of SC population** by income generating schemes, skill development and infrastructure development.
    - To **reduce the poverty among** the SC population and bring them above the poverty lines.
    - To **increase literacy and enrolment of SCs** in schools and higher education institutions.
- **3 components**
    - Development of SC dominated villages into an 'Adarsh Gram'.
    - Grants-in-aid for district/state-level projects for socio-economic betterment of SCs.

- Construction of hostels in higher educational institutions.

- **Eligibility Criteria** - For income generating and skill development schemes, the SC persons belonging to BPL category are eligible.
- In case of infrastructure development, the villages having 50% or more SC population are eligible.
- **Coverage** – It is implemented in 28 States/UTs.
- **Budget** – It is Rs. 2050 crore for FY 2023-24.

HIV/AIDS

- **Acquired immunodeficiency syndrome** (AIDS) is a **chronic**, potentially life-threatening **condition caused by the human immunodeficiency virus (HIV).**
- **HIV attacks the body's immune system**, making a person more vulnerable to other infections and diseases.
- **If HIV is not treated**, it can **lead to AIDS**.
- **Transmission**:
  - It is a **sexually transmitted infection** (STI).
  - It can also be **spread by contact with infected blood,** from illicit injection drug use, or by sharing needles.
  - It can also be **spread from mother to child during pregnancy**, childbirth, or **breastfeeding**.
- Treatment:
  - There is **currently no effective cure**. **Once people get HIV, they have it for life**.
  - However, **with proper medical care**, HIV **can be controlled**. People with HIV **who get effective HIV treatment (called antiretroviral therapy, or ART) can live long**, healthy lives and protect their partners.

Jellyfish with 240 tentacles discovered off Japan`s coast declared a new species
Santjordia Pagesi

- Santjordia pagesi, also called St. **George's Cross medusa jellyfish**, is a newly discovered **species of jellyfish**.
- It is considered "rare" and has been **found only in the Sumisu Caldera near** the **Ogasawara Islands**, about 600 miles southeast of Tokyo, **Japan**.
- "Santjordia" refers to Saint George in Catalan, representing its cross-shaped stomach.
- **Features**:
  - It is considered large at 4 inches wide and 3 inches tall.
  - It boasts a circular body with around **240 tentacles.**

- Its **body looks** almost like **a see-through cushion**. It has a t**hick white ring running along its lower edge.**
- Smaller **vein-like structures stretch from** its prominent **central stomach** to the outer ring.
- Its most distinctive feature is a **bright red, cross-shaped stomach**.
- The jellyfish's distinct features suggest it **may possess a novel cnidarian venom**.

Jellyfish

- A jellyfish is a type of **marine animal** belonging to the **phylum Cnidaria**, which includes creatures such as sea anemones, sea whips, and corals.
- Like all members of the phylum, the **body parts** of a jellyfish **radiate from a central axis**.
- These **are found in oceans around the world** and come in various shapes and sizes.
- Jellyfish have a **soft, transparent, and umbrella-shaped bell** that can **pulsate for movement. Hanging from the bell are tentacles**.
- Jellyfish have **tiny stinging cells in their tentacles** to stun or paralyse their prey before they eat them.
- **Inside their** bell-shaped **body is an opening that is their mouth**. They eat and discard waste from this opening.

Indian Railways launches Gajraj Suraksha, a new AI-based tech to curb elephant-train collisions

Gajraj Suraksha

- It uses an **AI-based algorithm** and a network **of sensitive optical fibre cables** to detect elephants getting close to railway tracks.
- It aims to **address the issue of elephant fatalities** resulting from train accidents.
- **Working**
  - Gajraj Suraksha **senses pressure waves generated by** the movement of **elephants** along the tracks.
  - As elephants move, the optical fibres detect vibrations caused by their footsteps.
  - These vibrations trigger signals within the optical fibre network, enabling the system to identify the presence **of elephants up to 200 metres** ahead of their arrival on the track.
  - The OFC-based Intrusion Detection System works by sending alarms to station masters whenever movement is detected along the tracks.
- The network is designed in such a way that **it can track the movement of the elephant** with great accuracy and report it to nearby station masters.
- This allows them to promptly inform locomotive drivers in the affected areas.

- This quick communication ensures that trains can be slowed down or stopped, preventing potential collisions with elephants.
- Indian Railway is planning to introduce this system in **West Bengal, Odisha, Jharkhand, Assam, Kerala, certain parts of Chhattisgarh, and Tamil Nadu.**

Sugarcane byproduct pressmud can be a sweet spot for India''s compressed biogas sector

Press Mud

- It is often known as **filter cake or press cake.**
- It is the **agricultural waste** obtained when cane juice is repeatedly filtered before being sent for sugar extraction.
- The filters are cleaned periodically, and the waste is deposited in the yard of the mill.
- Nearly 3 to 4 percent of press mud is obtained when one tonne of cane is crushed.
- At present, mills recycle this agricultural waste as manure by composting it and supplying it to the farmers in the area.
- **Benefits**
  - It can be utilised as a **feedstock for biogas production** through anaerobic digestion and subsequent purification **to create compressed biogas** (CBG).
  - It is very useful for **crops and horticulture** because of its richness in various micronutrients.
  - It has been acknowledged as a valuable resource for green energy production.
- **Issue with press mud:** Storing press mud proves challenging as it **undergoes gradual decomposition**, resulting in the **breakdown of organic compounds**.

compressed biogas (CBG)

- It is **produced naturally through a process of anaerobic decomposition** from waste / bio-mass sources like agriculture residue, cattle dung, sugarcane press mud, municipal solid waste, sewage treatment plant waste, etc.
- After purification, it is compressed and called CBG, which has a pure methane content of over 95%.
- It is exactly similar to commercially available natural gas in its composition and energy potential. With calorific value (~52,000 KJ/kg) and other properties similar to CNG

Amazon taps SpaceX''s Falcon 9 rocket to help launch Kuiper satellites

Project Kuiper:

- It is **Amazon's project** to build a **network of 3,236 satellites in low Earth orbit** to provide high-speed internet access anywhere in the world.
- Its mission is **to bring fast, affordable broadband to unserved** and underserved **communities around the world.**
- Project Kuiper has **three main parts:**
  - **Ground infrastructure:**
    - It includes **gateway antennas** that securely **send and receive**customer **data to and from satellites**, along with **telemetry, tracking, and control (TT&C) antennas** that keep the satellites properly operating.
    - **Global networking connects** those gateway **antennas to the internet**, public cloud, or private networks.
  - **Satellites**: They operate **in low Earth orbit (LEO)** and **relay data traffic** to and from gateway antennas and customers.
  - **Customer terminals:**
    - These are the technologies that Project Kuiper customers **use to receive broadband service.**
    - The terminals **combine antennas and processors** into a single, compact system to **deliver connectivity**.

Low Earth Orbit (LEO)

- LEO is an orbit around the Earth with an **altitude that lies towards** the **lower end of the range of possible orbits.**
- This is **around 1,200 miles (2,000 km)** or less.
- The **majority of satellites** are to be **found in LEO.**
- Unlike satellites in geostationary orbit (GEO) that must always orbit along Earth's equator, **LEO satellites do notalways have to follow a particular path**around Earth in the same way; **their plane can be tilted**.
- This **means there are more available routes** for satellites in LEO, which is one of the reasons why LEO is a very commonly used orbit.
- It is the orbit most **commonly used for satellite imaging**, as being near the surface allows it to take images of higher resolution.
- It is also the **orbit used for the International Space Station (ISS),** as it is easier for astronauts to travel to and from it at a shorter distance.
- However, **individual LEO satellites are less useful for** tasks such as **telecommunication because they move so fast** across the sky and therefore **require a lot of effort to track**from ground stations.
- Instead, **communications satellites in LEO often work as part of a** large combination, or **constellation**, of multiple satellites to provide constant coverage.

Study finds complex link between lipids and cholelithiasis

Cholelithiasis

- The condition of having gallstones is **called cholelithiasis.**
- It is a common hepatobiliary condition affecting mostly Western populations.
- It is a major risk factor for **cholangiocarcinoma,** which is a kind of **bile duct cancer.**

- Gallstones are hardened deposits of digestive fluid that form in the gallbladder.
- The gallbladder is a small, pear-shaped organ that lies beneath the liver and stores bile made by the liver.
- **Bile is a digestive fluid made of cholesterol**, bile salts, and bilirubin and gets released into the small intestine through the cystic duct and common bile duct to aid in fat digestion.
- **Causes:** The exact cause of cholelithiasis is not entirely clear. Cholelithiasis most **commonly results from** a **chemical imbalance within the contents of the gallbladder** in which the bile contains too much cholesterol or bilirubin.
- **Symptom**: The most common symptom of cholelithiasis is abdominal pain localized to the upper right or central abdomen.
- **Treatment**: It may be treated with medications or procedures.

Six Alien Planets in Coordinated Cosmic Ballet Discovered

- The star, **known as HD110067**, is located approximately **100 light-years away** in the **constellation Coma Berenices** and is about 20% less massive than our Sun.
- The six planets were detected by observing minute dimming of the star''s brightness as each planet transited, or passed in front of, the star from our perspective on Earth
- The orbital resonance of these planets, i.e., **their orbits, is synchronised** in such a way that they have remained stable for about 4 billion years.

Sub-Neptune planets

- These are the most **commonly observed types of planets in our galaxy.**
- They could be **rocky worlds with thick atmospheres of hydrogen and helium**gas, or perhaps composed of rock and ice with warm, water-rich atmospheres.
- These planets have **radii between those of the Earth and Neptune.**

Neptune

- It''s the **last of the planets in our solar system.**
- It''s more than 30 times as far from the sun as Earth is.
- Neptune is very similar to Uranus. It''s made of a thick fog of water, ammonia, and methane over an earth-sized solid centre.
- Its atmosphere is **made of hydrogen, helium, and methane**.
- **Structure and Surface**
  - Neptune is **encircled by six rings** and is an ice giant.
  - It is made of a thick soup of water, ammonia, and methane flowing over a solid core about the size of Earth.
  - It has a thick, windy atmosphere.
- **Time on Neptune**

- One day on Neptune goes by in 16 hours.
- Neptune has such a long journey around the sun that it takes 165 Earth years to go around once.

Piezoelectricity: Why quartz ticks

Piezoelectricity

- The term "piezoelectric" originates from the Greek words "piezein," meaning 'to squeeze', and "elektron", for amber, a material known for its **association with static electricity.**
- Piezoelectricity is a remarkable phenomenon whereby some materials, including quartz, ceramics such as lead zirconate titanate (PZT), and even certain biological substances like bone and tendons, can **generate an electric charge in response to mechanical stress.**
- This property is the **result of their unusual crystal structures.**
- Usually, the charges on atoms in the molecules that make them up are symmetric on two sides of an axis.
- When some stress is applied, the molecule becomes distorted, and the asymmetry of charges gives rise to a small electric current.
- Some materials also display an **inverse piezoelectric effect**, where the application of an electric current induces a mechanical deformation.
- **Applications**
  - Both direct and inverse piezoelectric materials are widely used **in pressure sensors, accelerometers, and acoustic devices,** where their ability to convert mechanical signals into electrical signals is crucial.
  - It is also used in **quartz watches**.
  - Piezoelectric transducers are common **in ultrasonic applications**, such as intrusion detectors and alarms.
  - Piezoelectric devices are employed at AF (audio frequencies) as **pickups, microphones, earphones, beepers, and buzzers.**
  - In wireless applications, piezoelectricity makes it possible to use crystals and ceramics as oscillators that generate predictable and stable signals at RF (radio frequencies).

Anthrobots: Human Cell-Derived Tiny Robots Leave Scientists Surprised

Anthrobots:

- These are constructed from **human tracheal cells** which are bio-robots that possess self-assembly capabilities.
- These are **capable of both movement and healing neurons** within a laboratory setting.

- They can spontaneously fuse together to form a larger structure called a superbot, which was able to encourage the growth of neurons.
- **Size:** They are **measuring between the width of a human hair** and the tip of a sharpened pencil.
- **Structure:** The anthrobots displayed diversity in structure and behavior. Some took on a **spherical shape** fully covered in cilia, while others resembled a football shape irregularly adorned with cilia.
- These anthrobots are **different from Xenobots**, which are created from embryonic stem cells of frog.
- **Application**
  - They hold promise for **regenerative medicine, wound healing, and disease treatment.**

Tracheal cells

- These are **from the lining of the bronchi/trachea**, the network of tubes used to convey air to the lungs.
- They are responsible for producing lubricating mucus to keep the airways functional and they are a type of epithelial cell, a term used generally to refer to cells lining the inside or outside of the body.
- These cells generate mucus and a number of other compounds, which **play an important role in respiration.**

Move over VoLTE, it's Vo5G time: How it works and when's India getting it

Voice over 5G:

- It is also known as **Voice over New Radio** (VoNR).
- This standard allows voice calls over 5G networks instead of the current standard that uses 4G.
- In simple terms, Vo5G takes all the improvements of 5G – speed, capacity, responsiveness – and applies them squarely to voice.
- It aims to have all that infrastructure and interoperability ready well in advance.
- To use Vo5G, you **need three things:** a phone that supports Vo5G, a carrier that offers Vo5G, and a 5G signal in your area.

How is VoNR better than VoLTE?

- VoNR brings clear advances over VoLTE with 5G's substantially **higher bandwidth and lower latency**compared to 4G LTE.
- **Enhanced call quality:** It utilizes more advanced audio codecs that provide superior clarity and fidelity based on 5G's increased data capacity.
- **Faster connection times:** It promises faster call connection times, ensuring a seamless and prompt user experience.
- **Improved reliability:** Vo5G aims to eliminate the notorious call drop issues, particularly during transitions between 5G and 4G.

- Lower packet loss contributes to better reliability, minimising the occurrence of voice cutouts during calls.

Human behaviour may be determined by fast changes in dopamine levels

Dopamine:

- It is a **neurotransmitter**.
- It is a chemical messenger that **helps in the transmission of signals in the brain**and other vital areas.
- It is found in **humans as well as animals**, including both vertebrates and invertebrates.
- It plays a **role as a "reward center**" and in many **body functions, including memory, movement, motivation, mood, attention,** and more.
- Dopamine is **released when your brain is expecting a reward**. When you come to associate a certain activity with pleasure, mere anticipation may be enough to raise dopamine levels.
- **Dysfunction of the dopamine system**has been **implicated in different nervous system diseases.**
- **High or low dopamine levels** are **associated with diseases including Parkinson's disease**, restless legs syndrome, and attention deficit hyperactivity disorder (ADHD).
- **Where is dopamine produced?**
  - **Neurons** in the region at the base **of the brain produce dopamine in a two-step process.**
  - First, the **amino acid tyrosine** is **converted into** another **amino acid, called L-dopa.**
  - Then **L-dopa undergoes** another **change as enzymes turn it into dopamine**.
- **In other parts** of the body, **dopamine acts as a type of hormone called catecholamine**. Catecholamines are **made in the adrenal glands**small hormone production factories that sit on top of the kidneys.
- There are **three main catecholamines: Dopamine, Epinephrine (adrenaline), and Norepinephrine.**
- These hormones get **released into the bloodstream when** the body is**physically or mentally stressed.** They cause biochemical changes that**activate the so-called fight-or-flight response.** That's the body's natural reaction to real or perceived stress.

Neurotransmitters

- Neurotransmitters are **chemical messengers that your body can't function without**.
- Their job is to **carry chemical signals**("messages") **from one neuron** (nerve cell) **to the next target cell.**
- The next target cell **can be another nerve cell, a muscle cell, or a gland.**

World"s first portable hospital "Aarogya Maitri Aid Cube" unveiled in Gurugram

Aarogya Maitri Aid Cube:

- It is the **world's first portable hospital**.
- Designed indigenously under **Project BHISHM** (**Bharat Health Initiative for Sahyog Hita and Maitri**), the modular trauma management and aid system is **made up of 72 detachable mini-cubes**, **each being a specialized station for emergency response** and humanitarian efforts.
- It **contains medical equipment and supplies** such as a mini-ICU, an operation theatre, cooking station, food, water, a power generator, blood test equipment, an X-ray machine, and more.
- The cubes are **capable of handling patients with** severe **injuries up to 25 major burns**, **long limb fractures**, **chest injuries**, **spinal injuries** and approximately 10 **head injuries**.
- It can **treat as many as 200 patients**.
- These cubes are **light and portable**, and can be **rapidly deployed anywhere**, from airdrops to ground transportation.
- **Design**:
  - It consists of **72 cubes** that can be **combined to form a specialized cage** capable of **accommodating 36 mini-cubes**. The mini-cubes are **packed with everything essential for the survival of 100 individuals for**duration of **48 hours.**
  - There are **two master cubes designed to be interconnected**, allowing them to **accommodate a maximum of 200 survivors**. The total weight of every master cube with 36 cubes is less than 750 kilos.
  - It **relies on the Rubik's Cube concept**and each of the cubes is designed to weigh less then 20 kilos to make it easy to carry up manually.
  - The structure will **also contain a tablet-based application which can operate all 72 cubes.**

Golden Mole Presumed Extinct Found Again in South Africa

De Winton's Golden Mole:

- It is an **elusive blind mole** that "**swims" through sand**, **lives in inaccessible burrows,** and has a **shimmering, iridescent coat**.
- **Scientific Name: Cryptochloris wintoni**
- **Distribution**:
  - It is **endemic to South Africa**.
  - It has only **ever been recorded in one location****Port Nolloth**, **on South Africa"s** northwest coast-where it was **last sighted in 1937.**
- **Habitat**: Its natural habitats are **subtropical dry shrubland**, Mediterranean-type **shrubby vegetation, and sandy shores.**
- **Features**:
  - The **upper parts have short, dense fur** that is **slate-grey with a yellowish tinge.**
  - Individual hairs have grey bases, whitish shafts, and fawn tips.
  - The **face, cheeks, and lips have** a more **intense yellowish tinge**.

- The **underparts are rather paler** than the upper parts, with individual hairs having white tips.
- The International Union for Conservation of Nature (**IUCN**) now **rates this species as "critically endangered".** It is currently the only golden mole species with that classification.
- It is **among the 25 "most wanted lost" species** that are the **focus of Global Wildlife Conservation"s "Search for Lost Species" initiative.**

New FjordPhantom Android Malware Targets Banking Apps in Southeast Asia
FjordPhantom

- It is a new **malware** that **employs virtualization** to elude detection and target applications.
- It **propagates through messaging services** and combines app-based malware with social engineering to **deceive banking customers**.
- It strategically zeroes in **on users within Southeast Asia**, encompassing countries such as Malaysia, Thailand, Indonesia, Singapore, and Vietnam.
- **Working**:
  - It **utilises email, SMS**, and **messaging apps to entice users into** unwittingly **downloading** what appears to be a legitimate banking **app, which contains FjordPhantom.**
  - When this app gets installed, the **attackers**, **posing as customer service representatives, guide** the **users** through the **steps to run the app.**
  - The malware **uses virtualization** to create a virtual container to run this app, and attackers **can monitor the user's actions** and **steal their credentials**.
  - It **facilitates attackers in gaining access to files and memory**, conducting debugging, and injecting code into other apps.
  - Additionally, the malware **logs various actions performed** by the targeted applications, signifying active development and suggesting potential targeting of other apps in the future.

Odia scientist discovers disease resistant wild okra
Abelmoschus Odishae

- It is a **new** plant **species of 'wild okra'**.
- It was **discovered in a moist deciduous forest** in Banspal block in Keonjhar district, **Odisha**.
- It **can be used** for hybridisation **to create a better variety with high disease resistance.**
- It can also play a vital role in widening the genetic base of okra.
- **Features**:
  - It is a **perennial shrub** up to 5 metres high with a **densely hispid, prickly stem** with retrorse hairs.
  - It has **large, deep yellow flowers**.
  - It has sub-reniform seeds with short, stout, and non-spiral trichomes.

- It also has a **seed viability of 95 percent**.

Okra

- Okra, also known as **gumbo** or **ladies' fingers**, is a **warm-season vegetable.**
- It is **native to the tropics of the Eastern Hemisphere** and is widely cultivated or naturalised in the tropics and subtropics of the Western Hemisphere.
- It comes in **green and red varieties**.
- It is **part of the mallow family of botanicals**, which also includes cocoa and cotton.
- It is a good **source of minerals, vitamins, antioxidants, and fibre**.
- Okra has a **mild taste** and a unique texture, with a peach-like fuzz on the outside. **Inside the pod are small, edible seeds.**
- It **contains a sticky juice** that people **use to thicken sauces**.

Indian Council of Agricultural Research (ICAR)

- It is an **autonomous organisation under** the **Department of Agricultural Research and Education** (DARE), Ministry of Agriculture and Farmers Welfare, Government of India.
- Formerly known as the Imperial Council of Agricultural Research, it **was established** on 16 July, 1929, **as a registered society under the Societies Registration Act**, 1860.
- It is responsible for **coordinating agricultural education and research in India.**
- With **113 ICAR institutes and 74 agricultural universities** spread across the country, this is one of the largest national agricultural systems in the world.
- **Headquarters: New Delhi.**

New fluorescent material detects anti-cancer drug overdose in minutes

Methotrexate

- It is a widely used **anti-cancer drug.**
- The MTX value of more than **10 µM in blood plasma is hazardous**.
- If it remains in the system for more than 10 hours, resulting in poisoning effects on the lungs, ulcers of the stomach, and heart stroke.
- MTX is highly expensive, and the detection of unwanted overdoses using traditional procedures is time-consuming and involves complex instrumentation.

Cancer

- It is a **disease in which some of the body's cells grow uncontrollably** and spread to other parts of the body.
- Cancer can start **almost anywhere in the human body**, which is made up of trillions of cells.
- **Risk factors:** Tobacco use, alcohol consumption, unhealthy diet, physical inactivity and air pollution are risk factors for cancer and other noncommunicable diseases.

Is White Lung Syndrome caused by a new pathogen?

White Lung Syndrome

- It originates from **distinctive white patches** on chest X-rays in affected children.
- The term includes various respiratory illnesses like acute respiratory distress syndrome, pulmonary alveolar microlithiasis, and silica-related conditions.
- **Causes:** It is believed to be caused by a combination of bacterial, viral, and environmental factors.
- **Signs and symptoms**
    - The patients have symptoms including cough, fever, runny nose, phlegm pileup in sinuses, difficulty breathing and fatigue.
- **Treatment**
    - The treatment is mainly focused **on addressing the symptoms of pneumonia** and ensuring the respiratory health of the patients.
    - Medicines are given to alleviate symptoms like cough and fever. Overall monitoring must be done and oxygen therapy provided if necessary.

Other lungs related infections

- **Acute respiratory distress syndrome** (ARDS) is a serious lung condition that occurs **when fluid builds up in the air sacs** in the lungs. This makes it difficult to breathe. ARDS can be caused by a variety of factors, including pneumonia, sepsis, and trauma.
- **Pulmonary alveolar microlithiasis** (PAM) is a **rare lung disease that is caused by deposits of calcium** in the air sacs of the lungs. This can cause shortness of breath, coughing, and chest pain.
- **Silicosis** is a lung disease that is caused by **inhaling silica dust**. Silica dust is found in sand, stone, and other materials. Silicosis can cause shortness of breath, coughing, and chest pain.

How does GPS work?

Global Positioning System (GPS)

- The U.S. Department of Defence started the GPS programme in 1973 and launched the first satellite in 1978.
- The modern GPS satellite constellation **consists of 24 satellites** moving around the earth in six orbits.
- Each satellite completes **two orbits in a single day**.
- The overall programme has **three main components**:
    - **Space segment**: It **consists of 24 satellites**. The six orbits they occupy **are all 20,200 km above the earth**, and each orbit has four satellites at all times. In this configuration, anyone on the earth will be able to 'see' at **least four satellites at a time.**
    - **Control segment:** It consists of **a global network of ground-based control stations** and antennae that track the 24 satellites, make sure their performance is as expected at all times, and transmit commands.

- **User segment:** It pertains to the use of GPS in various sectors and applications. The major sectors include agriculture, construction, surveying, logistics, telecommunications, power transmission, search and rescue, air travel, meteorology, seismology, and military operations.

How does it work?

- Each GPS satellite continuously broadcasts **a radio signal containing information** about its location in orbit, operational status, and the time at which the signal is emitted.
- The signals are transmitted at the **L1 (1,575.42 MHz) and the L2 (1,227.6 MHz)** frequencies at 50 bits/second.
- The signals are **encoded with code-division multiple access**.
- This allows multiple signals to be transmitted in the same channel and for a receiver to be able to disentangle them.
- There are **two encoding types**: the **coarse/acquisition mode**, which civilians can use to access coarse GPS data, and the **precise mode**, which is encrypted and is for military use.
- Being an electromagnetic signal, the radio waves travel at the speed of light.
- If the receiver has access to signals from four satellites, it will have the information required to calculate its location in four dimensions (three of space plus one of time relative to the satellite clock) – and can thus accurately triangulate its location on the ground.
- This informs the need for every point on the earth being able to 'see' four satellites at a time.

Being Nidhi's parents: A 24-year journey of joy and struggles with India's 'first' Pompe disease patient

Pompe disease

- It is a **rare inherited disorder** that affects one child per million.
- **Causes:**
  - **Mutations in the GAA gene** cause Pompe disease.
  - **The GAA gene** provides instructions for producing an **enzyme called acid alpha-glucosidase** (also known as acid maltase).
  - This enzyme is **active in lysosomes**, which are structures that serve as recycling centres within cells.
  - The enzyme normally breaks down glycogen into a simpler sugar called glucose, which is the main energy source for most cells.
  - Mutations in **the GAA gene prevent acid alpha-glucosidase** from breaking down glycogen effectively, which allows this sugar to build up to toxic levels in lysosomes.

- This buildup damages organs and tissues throughout the body, particularly the muscles, leading to the progressive signs and symptoms of Pompe disease.

- **Some common side effects and symptoms** include muscle weakness, respiratory issues, heart problems and difficulty swallowing.
- This **disease can be:**
  - **Infantile-onset:** symptoms begin in the first few months after birth.
  - **Late-onset or delayed-onset:** symptoms appear later in childhood or in adulthood.
- It affects males and females equally.
- **Treatment:** The treatment includes enzyme replacement therapy (ERT).

Solar Orbiter snaps clearest picture of Sun. Zoom in for a surprise

Solar Orbiter:

- It is a **Sun-observing satellite** with 10 science instruments, all designed to provide unprecedented insight into how the sun works.
- It is conceived to perform a **close-up study of our Sun and inner heliosphere**the uncharted innermost regions of our Solar System.
- It is a **joint mission of the European Space Agency** (ESA) **and NASA**.
- It is the **most complex** scientific **laboratory ever** to have been **sent to the Sun**.
- It will **take images of the Sun from closer than any spacecraft** before and, for the first time, look at its uncharted polar regions.
- The mission, launched on February 10, 2020, released its first images in June of that year.
- After multiple gravitational assist manoeuvres at Earth and Venus, it started its full science operations in December 2021.
- It follows an elliptical orbit around the sun, with the closest point, the perihelion, at about 25 million miles (40 million kilometres) from the sun, which is closer than the orbit of Mercury.
- **Instruments**: It carries **six remote-sensing instruments to observe the Sun** and the solar corona and **four in-situ** instruments to measure the solar wind, energetic particles, and electromagnetic fields.
- The mission is **scheduled to last until at least 2027.**

New young and highly scattered pulsar discovered with ASKAP

Pulsars

- Pulsars are **rotating neutron stars** observed to h**ave pulses of radiation at very regular intervals** that typically range from milliseconds to seconds.

- Pulsars **have very strong magnetic fields,** which **funnel jets of particles out**along the two magnetic poles. These **accelerates particles produce** very powerful **beams of light**.
- **Often, the magnetic field is not alignedwith** the **spin axis**, **so** those **beams ofparticles** and light are swept around as the star rotates.
- **When the beam crosses our line of sight, we see a pulse**; in other words, we see pulsars turn on and off as the beam sweeps over Earth.
- Pulsar **masses range between 1.18 and 1.97 times that of the Sun**, but most pulsars have a mass 1.35 times that of the Sun.

Neutron Star

- It is an **extremely dense** and **compact celestial object** that **forms when a massive star** runs out of fuel and **collapses under its own gravity.**
- The very **central region of the star**, **the core, collapses**, crushing together every proton and electron into a neutron.
- **If the core of the collapsing star is between** about **1 and 3 solar masses**, these newly-created neutrons can stop the collapse, **leaving behind a neutron star.** (St**ars with higher masses** will continue to **collapse into** stellar-mass **black holes**.)
- Since neutron stars began their existence as stars, they are **scattered throughout the galaxy** in the same places where we find stars. And like stars, they can **be found by themselves or in binary systems** with a companion.

Study of virus causing hemorrhagic disease in elephants might help in the development of diagnostics & therapeutics.

Elephant Endotheliotropic Herpesvirus:

- It is a **double-stranded DNA virus** that is classified in the family **Herpesviridae.**
- It causes acute, **fatal hemorrhagic disease** in wild and captive juvenile **Asian and African elephants.**
- It is lethal for young elephants **between the ages of one and 12.**
- The disease is usually fatal, with a **short course of 28-35 hours.**
- **Transmission:** Direct contact with body fluids of infected elephants (saliva, shedding from skin lesions, etc.)
- **Symptoms:** Some elephants show symptoms such as reduced appetite, nasal discharge and swollen glands.
- **Treatment:** It includes a combination of **antiviral therapy**, **aggressive fluid therapy** (to counter haemorrhaging), **immuno-stimulant drugs** (selenium and Vitamins C, E), antipyretics and analgesics (to bring down fever).
- There is no true cure for herpesviruses in animals or in humans because herpes viruses go latent.

Google launches its largest and "most capable" AI model, Gemini

Gemini AI model:

- It is a new **multimodal general AI model**, which means it can understand, and work with **different formats**, including text, code, audio, image, and video, at the same time
- It is **now available** to users across the world through Bard, some developer platforms and even the new Google Pixel 8 Pro devices.
- It can understand, explain and generate high-quality code in the world's most popular programming languages, like Python, Java, C++ and Go.
- It comes in three sizes — the yet -to-be-launched **Ultra, Pro and Nano.**
- **Gemini Ultra,** the largest and most capable model, will be meant for highly complex tasks. It is available now **only to select customers,** developers, partners and safety and responsibility experts for early experimentation and feedback.
- **Gemini Pro** will be best at scaling across a wide range of tasks and is now **available in Bard** for regular users across the world.
- **Gemini Nano** will manage **on-device tasks** and is already available on Pixel 8 Pro, powering new features like Summarise in the Recorder app and Smart Reply via Gboard.

IISER Bhopal researchers conduct first genome sequencing of jamun

Jamun tree:

- It is also known as jambolan, or black plum **tree and is a Myrtaceae plant family tropical tree**.
- Its natural range includes the **Indian sub-continent and South-East Asia.**
- The genus Syzygium contains 1,193 recognised species, including jamun.
- **Soil**
  - It can be grown on a wide range of soils.
  - However, for high yield potential and good plant growth, **deep loam and a well-drained soil are needed.**
  - It can grow well under salinity and waterlogged conditions too.
- **Climate**
  - It prefers to **grow under tropical and subtropical climate.**
  - It is also found growing **in lower ranges of the Himalayas** up to an altitude of 1300 metres.
  - It **requires dry weather** at the time oftowering and fruit setting.
  - In subtropical areas, early rain is considered to be beneficial for ripening of fruits and proper development of its size, colour and taste.
- **Benefits:** In Ayurveda the black plum is used to treat ailments such as **stomach discomfort, arthritis, cardiac problems**, flatulence, asthma, diarrhoea, and stomach spasms.

Research Symposium at the Global Partnership on Artificial Intelligence – GPAI 2023

Global Partnership on Artificial Intelligence:

- It is a multi-stakeholder initiative which aims to bridge the gap between theory and practice on AI by supporting cutting-edge research and applied activities on AI-related priorities.
- It was launched in **June 2020.**
- Membership in GPAI is **open to all countries,** including emerging and developing countries.
- **Member countries:** At present it has 28 member countries including the European Union.
- India is one of the founding members of GPAI.
- **Secretariat:** Its secretariat is hosted at the Organisation for Economic Co-operation and Development (OECD), Paris.
- **Structure**
  - It has a Council and a Steering Committee.
  - It has two Centres of Expertise: One in Montreal and another in Paris.
  - These Centres of Expertise will facilitate GPAI's four working groups and their research and practical projects, across various sectors and disciplines.
- The working groups will initially focus on **four themes:**
  - Responsible AI
  - Data Governance
  - the Future of Work
  - Innovation and Commercialization

IPC issues alert for painkiller mefenamic acid

The adverse drug reaction found during preliminary analysis was eosinophilia and systemic symptoms called DRESS syndrome

DRESS Syndrome:

- It is a type of drug allergy that can occur as a reaction to a large variety of medications.
- It is sometimes referred to as DIHS (Drug Induced Hypersensitivity Syndrome).
- This syndrome causes a diverse array of clinical symptoms, anywhere from 2 to 8 weeks after initiating the offending drug.
- **Symptoms:**

- Patients typically present with a rash, fever, and **eosinophilia** but can have a variety of symptoms including liver, lung, or kidney involvement.
- Also have a **visceral involvement**(hepatitis, pneumonitis, myocarditis, pericarditis, nephritis, and colitis) which is the major cause of morbidity and mortality in this syndrome.

- **Treatment:**
  - The most important step to treat DRESS Syndrome is to stop the medication involved in the reaction, and sometimes, no further treatment is needed.
  - It is largely supportive and symptomatic; **corticosteroids** are often used and sometimes immunosuppressants like cyclosporine.

Indian Pharmacopoeia Commission:

- It is an autonomous Institution of the **Ministry of Health and Family Welfare,** of India.
- It is created to **set standards of drugs**in the country.
- **Functions:**
  - Its basic function is to update regularly the standards of drugs commonly required for treatment of diseases prevailing in this region.
  - It **publishes official documents for improving Quality** of Medicines by way of adding new and updating existing monographs in the form of Indian Pharmacopoeia (IP).
  - It further **promotes rational use of generic medicines** by publishing National Formulary of India.
  - It **prescribes standards** for identity, purity and strength of drugs essentially required from the health-care perspective of human beings and animals.
  - It also provides **IP Reference Substances (IPRS)** which act as a fingerprint for identification of an article under test and its purity as prescribed in IP.

Can electricity from electric eels transfer genetic material to nearby animals?

- The researchers'' findings add to what we know about electroporation, a gene delivery technique. Electroporation uses an electric field to create temporary pores in the cell membrane. This lets molecules, like DNA or proteins, enter the target cell.
- The researchers thought that if electricity flows in a river, it might affect the cells of nearby organisms. Cells can incorporate DNA fragments in water, known as environmental DNA. To test this, they exposed the young fish in their laboratory to a DNA solution with a marker that glowed in the light to see if the zebrafish had taken the DNA. Then, they introduced an electric eel and prompted it to bite a feeder to discharge electricity.

- The researchers discovered that 5% of the larvae had markers showing gene transfer. This indicates that the discharge from the electric eel promoted gene transfer to the cells, even though eels have different shapes of pulse and unstable voltage compared to machines usually used in electroporation. Electric eels and other organisms that generate electricity could affect genetic modification in nature.

Electric eel

- The scientific name of this species is **Electrophorus Electricus** which is a fish that only lives in **freshwater areas.**
- They can release up to 860 volts, which is enough to run a machine.
- They emit a weak electric signal, which they use like radar to navigate, to **find a mate**, and **to find prey.**
- **Appearance:**
- It has a slender, snake-like body and flattened head.
- It has three specialized electric organs—the main electrical organ, the **Hunter's organ and the Sachs' organ** which make up about 80 percent of this fish's body.
- It can deliver a shock because its nervous system contains a number of disc-shaped electrogenic (electricity-producing) cells called electrocytes.
- **Habitat:** They dwell **mainly on the muddy bottoms of rivers** and occasionally swamps, prefering deeply shaded areas.
- **Distribution:** Its range spans across Brazil, the Guianas, Suriname, Venezuela, Colombia, Ecuador and Peru.
- **Conservation status**
- **IUCN: Least concern**

Electroporation

- Electroporation uses an electric field to create temporary pores in the cell membrane. This lets molecules, like DNA or proteins, enter the target cell.

Protein from Budgett's frog can block enzymes of disease-causing pathogens: Study

Budgett's frog

- **Behaviour**
  - Budgett's frogs are **highly intelligent and very aggressive**.
  - When frightened, they inflate themselves, stand up on their short legs and if this doesn't deter the potential predator, they lunge at them with an open huge mouth followed up by a shrill shriek.
  - During the **dry season**, Budgett's frogs **remain in burrows** they dig in the bottoms of pools of water.

- While in the burrow, they **will shed several layers** of skin from which to form a **waterproof cocoon** that will keep the frog moist.

- They use their exceptional night vision and their sensitivity to movement when hunting food.
- **Habitat/range:** They are found near or in permanent or seasonal bodies of water in **Paraguay, Argentina and Bolivia.**
- **Conservation Status**
  - **IUCN Red List: Least Concern**

Key findings of the research

- The **peptides** (short proteins) produced from the skin of amphibians have long been studied because of their **ability to counter unfavourable conditions** in the environment, including harmful pathogens.
- The frog-secreted peptide inhibited two key enzymes called **subtilisin carlsberg** and **proteinase K.,** produced by pathogens.
- These enzymes play a pivotal role in promoting infections by degrading specific protective proteins of the infected person.
- The peptide was shown to act through a **slow-tight binding pathway**, and was found to be as effective as SSI, a well-known **subtilisin inhibitor.**
- The researchers show the formation of a Michaelis complex – a tight, noncovalent complex with the intact inhibitor – during the process.

Astronaut Captures Image Of Mysterious "Red Sprite" High Above The Earth

Red sprite

- A red sprite represents an **extraordinary meteorological phenomenon** categorized as a Transient Luminous Event (TLE).
- Sprite is also an acronym for **Stratospheric/mesospheric Perturbations resulting** from Intense Thunderstorm Electrification.
- Occasionally dubbed red lightning, it occurs above thunderclouds at **altitudes between 40 and 80 kilometres (**25 - 50 miles) above the Earth''s surface.
- Lightning flashes normally go downward from the clouds to the ground.
- However, a sprite goes in the **other direction, going into the atmosphere**, a bit like backwards lightning.
- It **happens incredibly quickly** - in about a millisecond - which can make it tricky for scientists to capture and observe them.
- Also, as the red sprites form above thunder clouds, they are not easily studied from Earth and are mostly seen from space.

Other Transient Luminous Event

- **Blue jets:** These are quite faint and blue in colour and so this can make them tricky to spot. It is similar to red sprite.

- **Elves:** These are a type of TLE which form **expanding ring shaped glows**. They take place around 100 km (about 62 miles) above the ground over thunderstorms and happen so quickly they can''t be seen with the naked eye.

How do web browsers work?

Web browsers

- The browser is an **application that people use to send and receive messages** via the internet.
- It is a program that runs on your device, with its purpose being to fetch information in different formats from the internet and show it on the device.
- It also **does the reverse**, receiving your input (say, a click), translating it to code, and transmitting it to some other machine across the internet.
- In 1990, the English computer scientist **Tim Berners-Lee** introduced the concept of the World Wide Web also named **'WorldWideWeb'**.
- Modern web browsers have **multiple core components**
  - **Request and response**– When we enter a website's address (in the form of the Uniform Resource Locator, or URL) into your browser's address bar. The browser sends a request to a server, asking for the contents of the specific web page you're interested in.
  - This request travels through a network of servers, upon reaching the server, the request is received and processed. The server then formulates a response containing the information (or data) required to construct the web page.
  - **Deconstructing the response**– The response from the server is not a singular entity. Instead, it is an amalgam of various files. Typically, these files have **information encoded in three languages**: **HTML, CSS, and JavaScript**.
  - **Hypertext Markup Language (HTML):** It provides the architectural **blueprint of a webpage**.
  - **Cascading Style Sheets** (CSS): This information **imparts style and aesthetics** to the HTML structure by controlling attributes like colour schemes, fonts, spacing, and positioning. CSS ensures that the webpage comes into its unique visual identity.
  - **JavaScript: It** is the **dynamic engine**, making web pages interactive and responsive. It allows interactive elements **like pop-ups, forms, animations**, and real-time updates, creating an engaging user experience.
  - **Rendering**–This involves **deciphering the HTML** to understand the structural arrangement, applying CSS for stylistic finesse, and executing JavaScript to infuse interactivity.
  - **Managing data**– Browsers serve as adept custodians of your digital footprint, so they also **implement instruments like cookies** and cache to enhance your online experience.

- Cookies are small snippets of **data stored on your computer** by websites you visit.

Radiocarbon dating

Archaeologists have used radiocarbon dating to analyze the oldest true wooden frame saddle in East Asia, revealing how the rise of Mongolian steppe cultures was likely aided by advances in equestrian technology.

- Radiocarbon dating, **also known as carbon-14 dating, is a widely used method for determining the age of organic materials based on the decay rate of the radioactive isotope carbon-14 (^14C).**
- This technique has revolutionized archaeology, anthropology, and other fields that study the past.

What is Carbon-14?

- Carbon is an essential element found in all living organisms.
- Most carbon atoms are stable**, but a small fraction are radioactive isotopes like carbon-14**.
- Cosmic rays constantly bombard the Earth''s atmosphere, producing ^14C.
- When living organisms consume carbon through photosynthesis or eating, they incorporate a small amount of carbon-14 into their tissues.

Radioactive Decay of Carbon-14:

- Carbon-14 is radioactive and undergoes a process called radioactive decay.
- It **decays into nitrogen-14 (^14N) through beta decay**, emitting a beta particle (electron) and an antineutrino in the process.
- The half-life of carbon-14 is approximately 5,730 years.
- This means that after this period, half of the initial amount of carbon-14 in a sample will have decayed to nitrogen-14.

Dating Process

- **Sample Collection:** Archaeologists or scientists extract samples containing organic material, such as wood, bone, charcoal, or organic sediments, from the site of interest.
- **Isolation of Carbon:** The extracted material undergoes processing to isolate carbon in the form of graphite or carbon dioxide gas.
- **Measuring Carbon-14 Content:** Accelerator Mass Spectrometry (AMS) or other sensitive techniques are used to measure the ratio of carbon-14 to stable carbon-12 (^12C) in the sample.
- **Calibration:** The obtained ratio is compared to the known standard ratio to correct for fluctuations in atmospheric carbon-14 levels throughout history. This calibration accounts for changes caused by factors like solar activity and volcanic eruptions.
- **Calculating Age:** Using the measured ratio of ^14C to ^12C and its known half-life, scientists calculate the age of the sample. The equation used is based on the exponential decay of carbon-14.

Limitations and Considerations

- **Half-Life Limitation:** Radiocarbon dating is effective up to around 50,000 years, as after this time, the amount of remaining carbon-14 becomes too low to accurately measure.

- **Contamination:** Contamination by newer or older carbon-containing substances can skew results. Careful sample preparation and analysis are crucial to avoid this.
- **Calibration Issues:** Calibration curves are used to account for fluctuations in atmospheric ^14C levels, but uncertainties can still exist, affecting the accuracy of the dating.

Applications

- **Archaeology:** Dating ancient artifacts, human remains, and historical sites.
- **Geology:** Studying the age of organic materials in geological contexts.
- **Climate Science:** Analyzing carbon cycles and changes in the Earth''s atmosphere.

Radiocarbon dating provides invaluable insights into the age of organic materials and has significantly contributed to our understanding of human history and the natural world. Despite its limitations, it remains a powerful tool in scientific research. Continuous advancements in technology and calibration methods enhance its accuracy and broaden its applications across various disciplines.

Cassiopeia A (Cas A)

The Webb''s Near-Infrared Camera (NIRCam) has captured Cas A with unprecedented clarity, revealing the intricate aftermath of the star''s explosion. This supernova remnant, located 11,000 light-years away in the constellation Cassiopeia, is one of the most extensively studied objects in the universe.

- Cassiopeia A (Cas A) is a **well-known and intensely studied supernova remnant (SNR) located in the constellation Cassiopeia, approximately 11,000 light-years away from Earth**.
- It represents the remnants of a massive star that exploded in a supernova event, which was observed by Earth''s inhabitants around the year 1680.

Key Characteristics of Cassiopeia A

- **Supernova Explosion:** The supernova that created Cassiopeia A occurred nearly 340 years ago, but its light only reached Earth in the late 17th century. This makes Cas A one of the youngest known supernova remnants in our Milky Way galaxy.
- **Structure and Appearance:** The remnant spans about 10 light-years in diameter and is composed of rapidly expanding debris from the exploded star. Observations across different wavelengths, including radio, infrared, optical, and X-ray, have revealed various structures and elements within the remnant.
- **Elemental Composition:** Cassiopeia A is enriched with various heavy elements, including oxygen, silicon, sulfur, and iron. These elements were forged in the supernova explosion and later dispersed into space, eventually becoming part of new stars, planets, and celestial bodies.
- **Neutron Star Formation:** At the core of Cassiopeia A lies a dense stellar corpse known as a neutron star. This neutron star is a super-dense object formed from the collapsed core of the massive star that underwent the supernova explosion. It''s spinning rapidly, emitting powerful beams of radiation, and occasionally emitting pulses of radio waves, thus classified as a pulsar.

Research and Discoveries

- **Multi-Wavelength Observations:** Astronomers have extensively studied Cas A using various telescopes across different wavelengths. These observations have provided insights into the remnant''s dynamics, elemental composition, shockwaves, and the evolution of supernova remnants.
- **Elemental Synthesis:** Cas A''s analysis has significantly contributed to our understanding of nucleosynthesis, the process by which heavier elements are formed in the universe. The supernova explosion in Cas A played a vital role in dispersing these elements into space, enriching the interstellar medium.
- **Neutron Star Insights:** The neutron star at the center of Cassiopeia A has been a subject of intense study. Researchers use its behavior, including its rapid rotation and occasional emissions, to understand the extreme physics of neutron stars, magnetic fields, and their role in the universe.

Significance and Ongoing Studies

- **Astrophysical Laboratory:** Cassiopeia A serves as a laboratory for understanding the late stages of stellar evolution, supernova explosions, and the subsequent effects on interstellar material and cosmic evolution.
- **Continued Observations:** Ongoing observations with advanced telescopes and instruments aim to delve deeper into the structure and dynamics of Cassiopeia A, furthering our understanding of the physics behind supernovae, neutron stars, and their impact on the universe.

Chandra X-ray Observatory

- **Purpose and Function:** Launched in 1999, Chandra is a space-based telescope designed to observe X-rays from high-energy regions in the universe. It helps astronomers study celestial objects such as black holes, neutron stars, supernova remnants, galaxy clusters, and active galactic nuclei emitting X-rays.
- **Observational Capabilities:** Chandra has high-resolution X-ray optics that allow it to capture incredibly detailed images of X-ray emissions. It detects X-rays coming from extremely hot regions in the universe, revealing processes involving temperatures in millions of degrees Celsius that are invisible in other wavelengths.
- **Discoveries:** Chandra has contributed significantly to our understanding of the violent processes occurring in the universe, such as the dynamics of black holes, the behavior of matter in extreme environments, and the interactions of cosmic structures.
- **Technology:** Chandra uses four sets of nested mirrors to focus X-rays onto its detectors, providing precise and high-resolution images. Its instruments include imaging detectors and spectrometers specifically designed for studying X-ray emissions.

Hubble Space Telescope

- **Purpose and Function:** Launched in 1990, the Hubble Space Telescope (HST) is one of the most famous telescopes, observing primarily in visible, ultraviolet, and near-infrared wavelengths. It has provided breathtaking images of distant galaxies, nebulae, stars, and planets within our solar system.
- **Observational Capabilities:** Hubble''s location above Earth''s atmosphere allows it to capture clear and detailed images with minimal distortion. Its

instruments include cameras, spectrographs, and other scientific instruments that enable astronomers to study a wide range of cosmic phenomena.

- **Discoveries:** Hubble has made numerous groundbreaking discoveries, including observations of distant galaxies and the measurement of the rate of expansion of the universe (Hubble''s Law). It has provided key insights into the age of the universe, the formation of galaxies, and the existence of black holes.
- **Upgrades and Maintenance:** Over its operational life, Hubble has been serviced and upgraded by astronauts during multiple Space Shuttle missions. These servicing missions have extended its lifespan and improved its capabilities, allowing it to continue producing groundbreaking science.

Cassiopeia

- It is a prominent and easily recognizable constellation in the northern sky.

Overview:

- **Location and Visibility:** Located in the northern celestial hemisphere, Cassiopeia is visible at different times of the year depending on the observer''s latitude. For northern observers, it is circumpolar, meaning it never sets and is visible year-round.
- **Shape and Stars:** The five main stars that form Cassiopeia''s outline are Alpha Cassiopeiae (Shedir), Beta Cassiopeiae (Caph), Gamma Cassiopeiae (Tsih), Delta Cassiopeiae (Ruchbah), and Epsilon Cassiopeiae (Segin). Together, these stars create the distinctive shape that resembles a "W" or an "M."
- **Mythological Significance:** In Greek mythology, Queen Cassiopeia was punished by the gods for her vanity and boastfulness. She was placed in the sky along with her family as constellations, forever circling the celestial pole.

Key Features and Objects Associated with Cassiopeia:

- **Deep-Sky Objects:** While not as abundant in deep-sky objects as some other constellations, Cassiopeia hosts several interesting celestial objects, including open star clusters, nebulae, and galaxies.
- **The Heart Nebula (IC 1805):** A large emission nebula in Cassiopeia resembling a heart shape, it is a region of active star formation and is part of the Perseus Arm of our Milky Way galaxy.
- **The Pacman Nebula (NGC 281):** Another emission nebula, it is named for its resemblance to the video game character Pac-Man when observed in certain images.
- **Open Clusters:** Cassiopeia contains several open star clusters, such as Messier 52 (M52) and NGC 457, both of which are visible with binoculars or small telescopes.
- **Quasars and Galaxies:** Some galaxies and quasars are also found within the boundaries of Cassiopeia, though they may require larger telescopes for observation.

Astronomical Significance:

- **Navigation Aid:** Cassiopeia is used as a navigational reference for locating other constellations, including the North Star (Polaris) in the constellation Ursa Minor, which lies close to Cassiopeia.
- **Astronomical Observations:** Astronomers often study objects within Cassiopeia to explore aspects of star formation, stellar evolution, and cosmology.

- **Cultural Significance:** The constellation''s distinctive shape and position in the northern sky have made it a subject of fascination and storytelling across various cultures throughout history.

Cassiopeia A continues to be a crucial object of study in astrophysics, providing astronomers with valuable insights into the life cycle of stars, the formation of heavy elements, and the extreme environments created by supernova explosions. Its observations contribute significantly to our understanding of the universe''s fundamental processes.

Global Partnership on Artificial Intelligence (GPAI) Summit

- The Global Partnership on Artificial Intelligence (GPAI) Summit kickstarted in New Delhi, with Prime Minister Narendra Modi inaugurating the event.
- India is negotiating with the 28 other member countries to arrive at a consensus on a declaration document on the proper use of AI, the guardrails for the technology and how it can be democratised.

Global Partnership on AI (GPAI)

- **Objectives:** GPAI is a multi-stakeholder initiative focused on bridging the gap between theory and practice in AI. It involves various stakeholders like governments, industry experts, civil society, international organizations, and academia. The initiative aims to support cutting-edge research, address AI-related priorities, and promote international cooperation in AI development.
- **Declaration Document:** The summit seeks to create a declaration document that outlines the proper use of AI, sets guardrails for the technology, and emphasizes the democratization of AI. This declaration is expected to encompass discussions on evaluating AI in sustainable agriculture, collaborative AI, and aligning with India''s Digital Public Infrastructure (DPI) approach.

India''s Stance on AI at GPAI

- **DPI Approach:** India intends to apply its Digital Public Infrastructure (DPI) approach to AI. Similar to Aadhaar and Unified Payments Interface (UPI), this approach aims to build underlying systems facilitating the proliferation of AI. India seeks to develop robust databases and computing capacities to support AI''s wider implementation.
- **Summit Agenda:** India''s emphasis at the GPAI Summit revolves around evaluating AI in sustainable agriculture and fostering collaborative AI. These align with previous GPAI themes like healthcare, climate action, and building resilient societies.

Global Conversation on AI Regulation

- **EU''s AI Act:** The European Union has recently passed the AI Act, introducing strict safeguards on AI use, including restrictions on facial recognition and AI manipulation of human behavior. It aims to address concerns about AI misuse and empower individuals to lodge complaints against violations.
- **AI Safety Summit:** The UK hosted an AI Safety Summit where major countries agreed on the need for global action to address potential risks associated with AI, acknowledging risks related to cybersecurity, biotechnology, disinformation, bias, and privacy.

- **US Executive Order:** The United States issued an executive order aimed at safeguarding against AI threats and providing oversight over safety benchmarks used by companies evaluating generative AI models. This step was seen as the Biden Administration''s initial move to regulate advancing AI technology.

GPAI

- The Global Partnership on Artificial Intelligence (GPAI) is an international initiative established to guide the responsible development and utilization of artificial intelligence (AI), adhering to human rights and democratic values.
- **It was proposed by Canada and France during the 2018 G7 summit and formally launched in June 2020, hosted by the Organisation for Economic Co-operation and Development (OECD).**

Objectives and Structure of GPAI:

- **Objectives:** GPAI aims to bridge the gap between theory and practice in AI by supporting research and applied activities that are pertinent to policymakers in the AI realm. It brings together expertise from various sectors such as industry, civil society, governments, and academia to collaborate on addressing the challenges and opportunities posed by AI.
- **Membership:** The partnership initially began with fifteen founding members, including countries like Canada, France, Germany, India, Japan, the United States, and the European Union. Since then, its membership has expanded to include more nations, with the current count standing at 29 members.
- **Secretariat and Governance:** The OECD hosts a dedicated secretariat to support GPAI''s governing bodies and activities. It operates across several Working Groups focusing on themes like Responsible AI, Data Governance, Future of Work, and Innovation & Commercialization. These Working Groups are supported by Centers of Expertise in Montreal and Paris.
- **Leadership and Presidency:** GPAI has a Steering Committee and a Multi Stakeholder Group (MEG). The chairs of these groups change periodically, with different countries taking up the presidency. Canada, France, Japan, and India have assumed the presidency in different years since its inception in 2020.

Key Developments and Collaborations:

- UNESCO joined GPAI as an observer in December 2020.
- The membership increased with countries like Czechia, Israel, and several EU nations joining in November 2021.
- Themes of collaboration include Responsible AI, Data Governance, Future of Work, and Innovation & Commercialization, each supported by specific centers.
- The leadership rotates, with different countries hosting and chairing meetings to steer GPAI''s agenda.
- Unanimously adopted by 29 member countries, underscoring the need to mitigate risks related to AI development and deployment while promoting innovation.
- Emphasizes the economic potential of advanced AI systems for growth, innovation, and job creation across diverse sectors.
- Advocates for a global framework rooted in democratic values, human rights, dignity, personal data protection, intellectual property rights, privacy, and security for responsible AI use.

- Encourages equitable access to essential resources for AI innovation such as computing, diverse high-quality datasets, algorithms, and software.
- Recognizes the agriculture sector as a thematic priority for AI innovation.
- Commits to diverse membership, particularly focusing on low- and middle-income countries to ensure a broad range of expertise and shared experiences based on common values.
- Highlights Senegal''s elevation to the GPAI steering committee, indicating active participation within the grouping.
- New Delhi Declaration seeks a balance between promoting innovation and addressing AI-related risks.
- Bletchley Park Declaration (UK AI Safety Summit) prioritizes tackling potential AI risks, focusing on security and safety concerns related to AI systems.
- Shifted from previously considering no legal intervention in AI regulation to actively formulating regulations based on a "risk-based, user-harm" approach.
- Prime Minister Narendra Modi, during the GPAI Summit, acknowledged AI''s dual potential as a developmental tool and a potential hazard, stressing the need for a global framework ensuring responsible AI use.
- Incident involving deepfakes of popular personalities prompted discussions on concrete legislative steps to combat AI-based misinformation, potentially leading to new laws or amendments.
- The Telecom Regulatory Authority of India (TRAI) proposed establishing a domestic statutory authority to regulate AI through a "risk-based framework," suggesting collaborations with international agencies for responsible AI use.

Conclusion

The GPAI operates as a collaborative platform for international cooperation on AI, pooling expertise from various domains to address the ethical, regulatory, and practical challenges of AI adoption while promoting its responsible and ethical development globally.

India''s involvement in the GPAI Summit signifies its commitment to shaping global conversations on AI regulation, emphasizing collaborative efforts to ensure AI''s ethical and responsible utilization across sectors like agriculture, healthcare, and beyond.

Amrit Technology

Amrit Technology for removal of arsenic and metal ions from water.

Jal Jeevan Mission (JJM)

- **Mission Objective**:
- Initiated in August 2019 by the Government of India to ensure safe and adequate tap water supply to rural households.
- Implemented in collaboration with states, where they hold responsibilities for planning, execution, and maintenance of water supply schemes.

Progress:

- At the outset of JJM in August 2019, only 16.8% (approximately 3.23 Crore) of rural households had tap water connections.

- Progress report as of 07.12.2023 indicates significant development, with around 10.53 Crore additional rural households provided with tap water connections.
- Currently, out of the total 19.24 Crore rural households in India, about 71.51% (approximately 13.76 Crore households) have access to tap water supply in their homes.

State Responsibility

- **State Control**:
- Drinking water is under state jurisdiction, allowing states to choose water technology for piped supply schemes, especially in addressing water quality issues.
- **Government Support**:
- The central government aids states by offering technical and financial assistance for implementing JJM.
- Collaborates with institutions like Indian Institutes of Technology (IITs) to provide guidance on suitable technologies to tackle water quality concerns.

Arsenic Removal Technology - "AMRIT"

- **Technology Development**:
- Indian Institute of Technology (IIT) - Madras developed "AMRIT" (Arsenic and Metal Removal by Indian Technology).
- Utilizes nano-scale iron oxy-hydroxide to selectively remove arsenic and metal ions from water.
- Adaptable for both domestic and community levels of water purification.
- **Endorsement and Application**:
- "AMRIT" technology has received endorsement by the Department of Drinking Water and Sanitation"s "Standing Committee".
- Recommended for assessment of water and sanitation technologies.

Water Quality Measures

- **Short-Term Measures**:
- Operational guidelines of JJM necessitate the provision of interim measures, like Community Water Purification Plants (CWPPs), in areas affected by water quality issues, including arsenic.
- **Immediate Implementation**:
- As reported on the Integrated Management Information System (IMIS) of the Department, all 378 arsenic-affected habitations lacking tap water supply have been equipped with CWPPs, ensuring safe drinking and cooking water.

Arsenic

- Arsenic is a **naturally occurring chemical element with the symbol "As" and atomic number 33**.
- It is commonly found in the Earth"s crust and can be present in various forms, including inorganic and organic compounds.
- This metalloid has both metallic and non-metallic properties, making it versatile in different industrial applications.

Properties and Occurrence of Arsenic:

- **Physical Properties:**
- Arsenic is a gray, metallic-looking solid at room temperature and has a metallic luster.
- It can exist in various forms: yellow, black, and gray arsenic. The yellow form is the most unstable.
- **Chemical Properties:**
- Arsenic reacts with oxygen and water but doesn't dissolve in non-oxidizing acids.
- It forms various compounds, both organic and inorganic, with different chemical behaviors.
- **Occurrence:**
- Found naturally in soil, rocks, water, air, and living organisms.
- Commonly occurs in combination with other elements like sulfur, oxygen, and metals, especially in minerals.

Uses and Applications:

- **Historical and Industrial Uses:**
- Historically used in various fields like medicine, agriculture, and cosmetics.
- Once widely used in manufacturing, especially in wood preservatives, pesticides, herbicides, and some metal alloys.
- **Current Applications:**
- Semiconductor industry:Arsenic is used in the production of semiconductors, gallium arsenide-based electronics, and solar cells.
- Pharmaceuticals:Arsenic compounds have been explored in medical treatments, particularly in some cancer treatments.
- Agriculture:Formerly used in pesticides and herbicides, but its use has been largely restricted due to its toxicity.

Health and Environmental Concerns:

- **Toxicity:**

- Arsenic is highly toxic and exposure to elevated levels can cause severe health issues.
- Inorganic arsenic compounds are particularly dangerous and have been associated with various health problems, including cancers (skin, lung, bladder, etc.), skin lesions, cardiovascular diseases, and developmental issues.
- **Environmental Impact:**
- Arsenic contamination in water sources poses a significant environmental concern.
- Groundwater contamination with arsenic is a global issue and a major public health risk in some regions.

Arsenic in Water:

- **Sources of Arsenic**:
- Arsenic occurs naturally in the Earth"s crust and can seep into groundwater, especially in regions with specific geological formations.
- Anthropogenic sources include industrial activities like mining, smelting, and pesticide use.
- **Health Risks**:
- Chronic exposure to arsenic in drinking water can lead to skin lesions, cancers of the skin, bladder, and lungs.
- Long-term ingestion results in cardiovascular diseases, diabetes, and developmental issues in children.

Detection and Measurement:

- **Testing Methods**:
- Arsenic levels are measured using analytical methods such as atomic absorption spectroscopy (AAS) and inductively coupled plasma mass spectrometry (ICP-MS).
- Field test kits are available for on-site screening of water for arsenic contamination.
- **Regulations**:
- International standards set safe arsenic levels in drinking water. The World Health Organization (WHO) guideline is 10 µg/L, while different countries may have varying permissible limits.
- Regular monitoring and compliance with these standards are crucial to safeguard public health.

Mitigation Strategies:

- **Treatment Technologies**:

- **Coagulation-Filtration**: Adding chemicals to water to bind arsenic, followed by filtration to remove arsenic precipitates.
- **Adsorption Methods**: Using activated alumina, iron oxide, or activated carbon to absorb arsenic.
- **Ion Exchange and Reverse Osmosis**: Techniques to remove arsenic by exchanging ions or through selective filtration.
- **Community Interventions**:
- Community-level water treatment systems employing cost-effective technologies are vital for affected regions.
- Public awareness campaigns about the dangers of arsenic contamination and the importance of safe water sources.

Challenges:

- High-cost associated with advanced treatment technologies is a barrier, especially in low-resource regions.
- Ensuring sustainable access to safe water sources and regular monitoring in arsenic-affected areas remains a challenge.
- Ongoing research focuses on developing low-cost, efficient arsenic removal technologies suitable for different settings.
- Collaboration between scientific institutions, governments, and NGOs to implement effective arsenic mitigation strategies.

Toxic metals in water

Sources and Entry into Water:

- **Natural Sources**:
- Geological processes like weathering of rocks and soil erosion release toxic metals into water bodies.
- Minerals and ores contain these metals, leaching into groundwater or surface water.
- **Anthropogenic Activities**:
- Industrial discharge, mining, improper waste disposal, and agricultural runoff are primary human-made contributors to water contamination.
- Pipes, fittings, and storage tanks can leach metals, adding contaminants to drinking water systems.

Common Toxic Metals:

- **Arsenic**:
- **Sources**: Natural occurrence in rocks, human activities like mining, industrial discharge.
- **Health Impacts**: Causes skin lesions, cancers, cardiovascular issues, and developmental problems.

- **Lead**:
- **Sources**: Plumbing systems, lead-based paints, batteries, industrial waste.
- **Health Impacts**: Affects the nervous system, developmental issues in children, hypertension.
- **Mercury**:
- **Sources**: Industrial discharge, mining, combustion of fossil fuels.
- **Health Impacts**: Neurological issues, impaired vision, kidney problems, developmental issues in children.
- **Cadmium**:
- **Sources**: Industrial discharge, batteries, metal plating.
- **Health Impacts**: Kidney damage, skeletal issues, respiratory problems.
- **Chromium**:
- **Sources**: Industrial waste, tanneries, stainless steel manufacturing.
- **Health Impacts**: Respiratory issues, skin irritation, lung cancer.

Detection and Measurement:

- **Analytical Methods**: Various methods such as spectroscopy, chromatography, and atomic absorption are used to detect and measure toxic metals in water.
- **Regulatory Standards**: Different countries have set permissible limits for toxic metals in drinking water to safeguard public health.

Mitigation Strategies:

- **Water Treatment**: Techniques like coagulation-filtration, ion exchange, reverse osmosis, and adsorption used to remove toxic metals from water.
- **Community Initiatives**: Establishing community-level water treatment facilities to provide safe water in affected areas.
- **Public Awareness**: Education on the risks of consuming contaminated water and the importance of using safe water sources.

Toxic metals in water pose a serious threat to public health and the environment. A multifaceted approach involving stringent regulations, efficient monitoring, advanced treatment technologies, and global cooperation is essential to mitigate the risks associated with these contaminants and ensure access to safe and clean drinking water for all.

Barracuda

Barracuda, the fastest solar-electric boat in India, stands as a remarkable feat of engineering and innovation, designed and built by a team of students from the Indian Institute of Technology Madras.

Key features and significance

- **Fastest Solar-Electric Boat:** Barracuda is dubbed as India''s fastest solar-electric boat. It''s designed by Navalt Solar and Electric Boats and can achieve speeds of up to 12.5 knots (around 23 kmph).
- **Eco-Friendly Design:** The boat operates solely on clean energy sources. It''s powered by twin 50 kW electric motors, a marine-grade LFP battery, and incorporates 6 kW of solar power. This reliance on renewable energy minimizes air pollution and significantly reduces noise and vibration while in operation.
- **Versatility and Efficiency:** The Barracuda isn''t just about speed and eco-friendliness; it''s a versatile vessel capable of navigating through rough seas

with waves as high as four meters. It can ferry up to 12 passengers and cargo, making it a practical and efficient choice for maritime transportation.

- **Range and Durability:** On a single charge, the boat boasts a range of seven hours, showcasing its endurance and suitability for various purposes, including as a workboat.
- **Recognition and Awards:** Navalt Solar and Electric Boats, the company behind the Barracuda, has garnered recognition for its innovation. Winning the world''s best start-up award in the mobility and transportation category at the Berlin Start-up Energy Transition Awards 2023 highlights the boat''s significance in the global shift towards sustainable transportation.
- **Future Implications:** The introduction of the Barracuda by Mazagon Dock Limited in Mumbai indicates a step towards embracing eco-friendly alternatives in maritime industries, potentially paving the way for similar sustainable vessels in the future.
- Barracuda represents a leap towards cleaner, quieter, and more sustainable maritime transportation, demonstrating the potential for innovation and eco-consciousness in the industry.

Norovirus

Norovirus cases have been on the rise in the UK in recent weeks, with numbers being 60% higher than the same time last year.

- Norovirus is a highly contagious virus notorious for causing gastroenteritis, resulting in symptoms like vomiting, diarrhoea, abdominal cramps, nausea, muscle aches, headache, fever, and sometimes chills.
- **It is commonly referred to as the "stomach flu" or "winter vomiting bug,"** but it is important to note that norovirus is distinct from influenza and specifically causes gastrointestinal issues.

Nature of Norovirus

- Norovirus exists in numerous strains, and individuals can experience multiple infections in their lifetime due to the diversity of these strains.
- It''s highly contagious and easily transmitted from person to person, primarily through:
- **Contaminated Surfaces:** The virus can persist on surfaces like doorknobs, countertops, or objects touched by an infected person. Contact with these surfaces and subsequent hand-to-mouth actions can lead to infection.
- **Contaminated Food and Water:** Norovirus can contaminate food and water during preparation or handling by an infected individual, leading to widespread outbreaks if consumed by others.

Symptoms of Norovirus Infection

- The typical onset of symptoms occurs within one to two days after exposure to the virus.

- **Gastrointestinal Distress:** Vomiting and diarrhoea are hallmark symptoms. These can be severe, leading to dehydration due to the loss of fluids.
- **Nausea, Abdominal Pain, and Fever:** Patients often experience nausea, cramping abdominal pain, accompanied by a fever, headaches, and body aches.

Transmission Routes

- **Person-to-Person Contact:** Close contact with infected individuals, especially through exposure to their vomit or stool, is a primary transmission route.
- **Contaminated Surfaces and Objects:** The virus can persist on surfaces and objects for an extended period, making transmission possible through touching contaminated surfaces and then touching the face or consuming contaminated food without proper hand hygiene.
- **Contaminated Food and Water:** Consumption of food or water contaminated during preparation or handling by an infected person can result in infection.
- **Aerosolized Vomit or Stool:** Even the air around an area contaminated with vomit or stool can potentially spread the virus.

Treatment

- There is **no specific antiviral treatment for norovirus.**
- There is **no currently available vaccine for norovirus.**
- Resting, managing symptoms, and ensuring adequate hydration to prevent dehydration are the primary focus.
- Individuals are advised to avoid certain foods and activities until they recover. Severe cases might necessitate hospitalization for intravenous fluids to prevent dehydration.

Prevention

- Frequent handwashing with soap and water is paramount in preventing infection.
- Thoroughly cleaning and disinfecting surfaces, especially in areas where infected individuals have been present.
- Ensuring proper cooking of food, particularly shellfish, and careful washing of fruits and vegetables before consumption.
- Limiting contact with sick individuals helps minimize transmission.

Complications

- Norovirus infections are typically short-lived and resolve within a few days. However, for vulnerable populations such as young children, the elderly, and immunocompromised individuals, there''s a higher risk of dehydration and complications, making the illness potentially more severe.
- Norovirus, while highly contagious, is typically not severe. Practising good hygiene and taking precautions can significantly reduce its spread, safeguarding both oneself and others from infection.

China"s Scientific Marvel: Key Points About the World"s Deepest Lab - DURF

Milestone Achievement:

- China achieves a physics milestone with the operationalization of the Deep Underground and Ultra-low Radiation Background Facility (DURF).
- World"s deepest lab located 2,400 meters below Jinping Mountain in Liangshan Yi Autonomous Prefecture, Sichuan Province.

- **Location and Structure:**
  - DURF is part of the China Jinping Underground Laboratory"s second phase.
  - Total room capacity of 330,000 cubic meters.
  - Three years of upgrades and expansion, construction started in December 2020.
  - Jointly built by Tsinghua University and Yalong River Hydropower Development Company, Ltd.
- **Scientific Objectives - Dark Matter Exploration:**
  - Primary objective is to contribute to the global search for dark matter.
  - DURF"s extreme depth blocks cosmic rays, aiding in precise dark matter observations.
  - Strategic advantage for deep-earth experiments.
- **Cosmic Ray Shielding:**
  - Yue Qian, a professor at Tsinghua University, highlights DURF"s exposure to an incredibly small amount of cosmic rays (one hundred-millionth of the Earth"s surface).
  - Enables an unparalleled environment for experiments free from cosmic intrusions.
- **State-of-the-Art Facilities:**
  - Ultra-low cosmic ray flux, extremely low environmental radiation, exceptionally low radon concentration, and ultra-clean space.
  - Ideal setting for precision experiments in physics with unprecedented clarity.
- **Historical Context - From Concept to Reality:**
  - Journey began with the completion of the first phase of the China Jinping Underground Laboratory in 2010.
  - Initial phase with a room capacity of 4,000 cubic meters.
  - DURF builds on the foundation, making significant contributions to China"s dark matter direct detection experiments.
- **Collaborative Construction:**
  - DURF constructed through collaboration between Tsinghua University and Yalong River Hydropower Development Company, Ltd.
  - Represents a significant scientific achievement in the realm of physics.

What is ketamine, the drug involved in Actor Matthew Perry's death?

In recent years, ketamine has become a subject of widespread debate for its increased use in treating depression and serious mental health issues. While some experts and patients lauded it as lifesaving, others criticized it as addictive.

Ketamine

- Ketamine is a dissociative anaesthetic hallucinogen that has been used as an anaesthetic for animals since the 1960s and was later approved for human use by the US Food and Drug Administration.
- **It is known for creating a feeling of detachment from pain and the environment.** In recent years, ketamine has gained attention for its potential therapeutic effects in treating depression and other serious mental health issues, especially in cases where traditional therapies have not been effective.

Methods of Consumption

- Patients with mental health issues typically take ketamine through an IV, nasal spray, or tablet once or twice a week for a specified treatment period.
- For recreational purposes, ketamine is often snorted as a white crystalline powder. It can also be injected or smoked.

Effects of Ketamine

- Some patients undergoing ketamine treatment report positive experiences, describing it as a "reset button for the brain." During treatment sessions, individuals may have pleasant visualizations and a sense of detachment, leading to a reduction in the perceived weight of daily problems.
- Ketamine affects brain receptors that traditional antidepressants do not target, leading to a psychedelic-like experience. This aspect is considered by many to be integral to the drug''s therapeutic effect.

Safety Considerations

- When used for medicinal purposes and in the right doses, some doctors argue that ketamine can be safe and effective in treating mental illnesses.
- **There are concerns about potential addiction and health risks, especially when taken chronically in high doses.** Chronic use may lead to severe bladder damage, and there are indications that abuse could result in cognitive impairment.
- There is limited research on prolonged ketamine treatment and its safety. Additionally, there is a lack of literature on addiction and abuse among medical users.

The safety and efficacy of ketamine, especially in non-medical settings, remain topics of ongoing research and debate. When used under medical supervision, ketamine can be a valuable tool for anaesthesia and potentially for certain mental health conditions, but its recreational use poses significant health risks.

Covid-19 JN.1 Highlights

The detection of the JN.1 sub-variant of COVID-19 in Kerala has triggered several responses and concerns.

- The JN.1 sub-variant, currently spreading in the US and China was identified in Kerala through routine surveillance by INSACOG (Indian SARS-CoV-2 Genomics Consortium).
- The case was discovered in Karakulam, Thiruvananthapuram, in a sample that tested positive on November 18. The patient experienced mild influenza-like illness (ILI) symptoms and has since recovered.
- The Union Health Ministry is actively coordinating with state health authorities and conducting mock drills across health facilities nationwide to assess their readiness and preparedness by December 18.
- **JN.1 is closely related to the Pirola variant** (BA.2.86) and carries one additional mutation in the spike protein compared to its relative.

Concerns and Observations

- An increasing trend of COVID-19 cases in Kerala, attributed partially to heightened testing of ILI cases, has been noted. Most cases are mild and recovering at home.
- Despite generally low global COVID-19 cases this year, a slight rise has been observed in early December, especially with the emergence of JN.1 in the US, China, and Singapore.

The detection of the JN.1 sub-variant of COVID-19 in Kerala prompts health authorities to initiate coordinated efforts. Despite its global prevalence, updated vaccines have shown efficacy against related variants, emphasizing the importance of ongoing preventive measures in managing the evolving landscape of COVID-19.

Nyholm Prize

Professor Savita Ladage from the Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research (TIFR), has been awarded the prestigious Royal Society of Chemistry''s (RSC) Nyholm Prize for Education in recognition of her outstanding contributions to chemistry education.

- **Professor Savita Ladage received the Royal Society of Chemistry's Nyholm Prize for Education** is a significant recognition of her exceptional contributions to chemistry education.
- Professor Ladage''s primary focus on advocating the significance of chemical education has been instrumental.
- Her efforts extend to mentoring chemistry educators and leading various programs benefiting teachers and students in advancing chemistry education across India.
- The **Royal Society of Chemistry''s Nyholm Prize acknowledges her remarkable dedication to chemistry education**. It places her among a group of esteemed individuals who have made significant contributions to the field.

- The award, comprising £5,000, a medal, and a certificate, reflects her outstanding commitment and influence in this domain.

The Nyholm Prize celebrates exceptional individuals contributing to various levels of education in the chemical sciences. This recognition extends to teachers, technicians, and others involved in shaping and advancing education in chemistry.

Radon

Radon is a gas, an invisible killer which is responsible for over 21,000 deaths per year, as per reports of EPA.

- Radon is a **colorless, odorless, and tasteless radioactive gas that occurs naturally as a result of the breakdown of uranium in soil, rock, and water.**
- It is a significant health concern as prolonged exposure to elevated levels of radon can lead to serious health issues, particularly lung cancer.

Atomic and Chemical Properties

- **Atomic Number and Decay**: Radon has the atomic number 86 and is a member of the noble gas group. It is produced through the decay of heavier elements, primarily uranium and thorium, in the Earth''s crust.
- **Radioactive Isotope**: The most common isotope of radon found in nature is Radon-222 (Rn-222), which undergoes alpha decay. It emits alpha particles during decay, transforming into polonium-218, part of a decay chain eventually resulting in stable lead-206.

Sources of Radon

- **Uranium Decay**: Radon is formed as part of the decay chain of uranium-238, which occurs in many types of rocks and soils, particularly granite and shale.
- **Soil and Rock**: Radon is produced from the decay of uranium, which is found in varying concentrations in soil and rocks. It seeps into buildings through cracks in the foundation, walls, floors, gaps around pipes, and other openings.
- **Water**: Groundwater sources can contain dissolved radon. When this water is used for activities like showering or washing dishes, radon can be released into the air.

Health Effects of Radon

- **Alpha Radiation**: The decay of radon and its progeny emits alpha particles, which, when inhaled, can damage the cells lining the lungs. These damages to lung tissue can lead to the development of lung cancer over time.
- Radon exposure is the **second leading cause of lung cancer after smoking.**
- **Ionizing Radiation and Carcinogenesis**: Radon decay products, upon inhalation, emit ionizing radiation energy, affecting bronchial epithelial cells. Prolonged exposure may trigger the process of carcinogenesis, leading to lung cancer.
- Smokers exposed to radon are at an even higher risk.

Radon Detection and Measurement

- **Detection Methods**: Radon is measured in the air using various methods, including alpha track detectors, charcoal canisters, continuous monitors, and electret ion chambers. Waterborne radon can be measured through liquid scintillation or using specific radon detectors.
- **Radon Testing**: Testing for radon is crucial to determine if levels are elevated in a building. Short-term and long-term tests are available. Short-term tests usually last from 2 to 90 days, while long-term tests run for more than 90 days.
- **Radon Measurement Units**: Radon concentration is measured in picocuries per liter of air (pCi/L). The EPA recommends action if levels reach or exceed 4 pCi/L.
- **Radon Testing Importance**: It is emphasized that testing indoor radon levels is vital. Levels above 148 Becquerels per cubic meter require mitigation to reduce health risks.

Radon Mitigation

- **Radon Mitigation Systems**: Several methods can reduce radon levels in buildings. Common systems include sub-slab depressurization (active soil depressurization), which uses pipes and fans to draw radon from below the building and vent it outside.
- **Sealing Cracks and Openings**: Improving the airtightness of a building''s foundation and structure can help prevent radon from entering.

Radon exposure poses a significant health risk, and taking proactive measures such as testing, mitigation, and awareness campaigns are essential to reduce its health impacts. Regular testing and appropriate mitigation strategies can significantly lower radon levels, ensuring a safer living and working environment.

Hydrogen Cyanide

Scientists have found hydrogen cyanide — a key molecule in the creation of life — in the oceans of Saturn's icy moon Enceladus, according to a new study based on data from the National Aeronautics and Space Administration's (NASA) Cassini spacecraft.

- **Study Details**: The research utilized data obtained from the Cassini spacecraft, which investigated plumes of gas, water, and ice ejected from Enceladus'' surface.
- **Detection of Hydrogen Cyanide**: Scientists identified hydrogen cyanide along with other compounds like methanol, ethane, and oxygen in the plumes of water vapor, indicating a diverse and dynamic ocean chemistry beneath Enceladus'' icy surface.
- Hydrogen cyanide (HCN) is a **highly toxic, colorless, and extremely flammable gas with a faint, bitter almond-like odor in its pure form.**
- It is a deadly chemical compound that poses serious health hazards to humans and animals.

Significance for Life Formation

- **Chemical Energy**: This discovery suggests that the oceans beneath Enceladus'' frozen crust possess more chemical energy than previously

assumed, potentially supporting the formation and survival of complex organic compounds essential for life.

- **Supporting Habitability**: Enceladus has long been known for harboring organic molecules and compounds crucial for life. This finding strengthens the notion of the moon''s potential habitability.

Implications for Astrobiology

- **Building Blocks of Life**: Hydrogen cyanide is recognized as a fundamental molecule in the creation of biological building blocks, and its presence on Enceladus indicates the possibility of processes conducive to life.
- **Complex Biomolecule Formation**: The discovery offers insights into the potential pathways for the formation of complex biomolecules crucial for sustaining life.

Enceladus

Physical Characteristics:

- **Size and Composition**: Enceladus is a relatively small moon with a diameter of about 310 miles (500 kilometers). It is composed largely of water ice, making it one of the brightest objects in the solar system.
- **Surface Features**: Its surface is marked by deep fissures, cracks, and a lack of impact craters in some regions, indicating geological activity and ongoing changes.

Subsurface Oceans:

- **Discovery**: Enceladus gained attention for its subsurface oceans, confirmed by observations showing water vapor and icy plumes erupting from its south polar region.
- **Hydrothermal Activity**: These plumes suggest the existence of hydrothermal vents beneath the icy surface, potentially providing a suitable environment for life to thrive.

Potential for Life:

- **Organic Compounds**: Data from NASA''s Cassini spacecraft revealed the presence of complex organic compounds and molecules, including hydrogen cyanide, in Enceladus'' plumes, enhancing the moon''s potential habitability.
- **Habitable Zone**: The existence of liquid water and potential energy sources within Enceladus'' subsurface ocean positions it within the habitable zone, raising the possibility of supporting microbial life.

Exploration Missions:

- **Cassini-Huygens Mission**: The Cassini spacecraft, a collaboration between NASA, ESA, and ASI, provided extensive data on Enceladus, including flybys and observations of its plumes. The Huygens lander explored Saturn''s moon Titan but didn''t visit Enceladus.

Properties of Hydrogen Cyanide

- **Chemical Formula**: HCN (one carbon atom, one nitrogen atom, and one hydrogen atom)
- **Physical State**: Colorless gas with a faint, bitter almond-like odor (odor threshold varies among individuals)
- **Solubility**: Highly soluble in water, forming hydrocyanic acid (HCN dissolved in water is also referred to as prussic acid)

- **Flammability**: Highly flammable and combustible in air

Sources and Production

- **Natural Occurrence**: Hydrogen cyanide can be found naturally in certain plants, such as in the seeds of some fruits like apricots, peaches, and almonds.
- **Industrial Production**: Synthesized through various methods including Andrussow process (ammonia, natural gas, and oxygen), as well as through the hydrolysis of cyanide salts.

Uses of Hydrogen Cyanide

- **Chemical Manufacturing**: It serves as a precursor for many chemical compounds used in plastics, pharmaceuticals, dyes, and pesticides.
- **Fumigation**: Used in pest control, particularly for exterminating rodents and insects.

Health Effects and Toxicity

- **Toxicity**: Hydrogen cyanide is highly toxic and can be lethal even in small quantities. It interferes with cellular respiration by inhibiting the body''s ability to use oxygen, leading to suffocation.
- **Symptoms of Exposure**: Inhalation or ingestion can cause dizziness, headache, nausea, rapid breathing, convulsions, loss of consciousness, and ultimately death.
- **Inhibition of Cellular Respiration**: Hydrogen cyanide inhibits cytochrome c oxidase in mitochondria, disrupting the electron transport chain and cellular respiration, leading to metabolic asphyxiation.
- **Biodegradation**: Hydrogen cyanide can break down in the environment through microbial degradation and photochemical reactions.
- **Toxicity to Aquatic Life**: It poses a threat to aquatic organisms, especially in high concentrations.

Detection and Safety Measures

- **Detection Methods**: Specialized equipment like gas detectors or chemical test kits are used to detect hydrogen cyanide gas.
- **Safety Measures**: Workers in industries where HCN is used must follow strict safety protocols, including wearing protective gear and working in well-ventilated areas.
- **First Aid**: Immediate medical attention is crucial if exposure to hydrogen cyanide occurs. Artificial respiration and administration of specific antidotes like hydroxocobalamin may be necessary.

The detection of hydrogen cyanide on Enceladus, alongside other compounds, underscores the moon''s significance in astrobiology. This finding not only expands our understanding of the moon''s potential habitability but also sheds light on the possible processes involved in the creation of life-sustaining compounds, offering exciting prospects for further exploration and research into the mysteries of Enceladus.

TEMPO SATELLITES

- NASA''s **new satellite to hourly measure air pollution hourly** has shown significant progress and now the space agency officials are already thinking about ways to extend its life.

- TEMPO is **NASA's first Earth-observation satellite in geostationary orbit** and has developed further from previous polar-orbiting satellites provided daily observations to provide 10 to 12 daily scans.

Mission and Objectives

- **Purpose:** TEMPO is a space-based ultraviolet–visible spectrometer designed to monitor air pollution across greater North America.
- **Measurements:** It provides high-resolution, hourly data on atmospheric pollutants like ozone, nitrogen dioxide, and formaldehyde.

Instrumentation and Operation

- **Spectrometer Design:** TEMPO"s ultraviolet–visible spectrometer measures reflected sunlight from the Earth"s atmosphere and dissects it into 2,000 component wavelengths.
- **Geostationary Host:** Hosted as a payload on a commercial geostationary communication satellite, TEMPO maintains a constant view of North America.
- **Coverage Area:** Scans the region from the Pacific Ocean to the Atlantic Ocean and from the Alberta oil sands to Mexico City.

Constellation and Collaborations

- **Geostationary Constellation:** TEMPO contributes to a constellation of pollution-monitoring assets, including ESA"s planned Sentinel-4 and South Korea"s Geostationary Environment Monitoring Spectrometer (GEMS).
- **Partnerships:** Developed as a collaboration between NASA and the Smithsonian Astrophysical Observatory.

Integration and Launch

- **Host Satellite:** TEMPO resides on the Intelsat 40e satellite, built by Maxar Technologies, responsible for payload integration.
- **Launch Date:** It was sent aloft in April and built by Ball Aerospace.

Program

- **Earth Venture-Instrument Program:** TEMPO is NASA"s inaugural Earth Venture-Instrument (EVI) mission.
- **EVI"s Role:** Part of NASA"s Earth System Science Pathfinder (ESSP) program office, supporting innovative, low-cost missions driven by scientific research and applications.
- **Competitive Selection:** Selected through competitive solicitations, EVI missions address various areas of Earth science.

Other Earth Venture Missions

- **Nature of Missions:** EVI missions are characterized as small-sized, competitively selected orbital missions or instrument missions of opportunity.
- **Examples:** Include missions like NASA-ISRO Synthetic Aperture Radar (NISAR), Surface Water and Ocean Topography (SWOT), ICESat-2, and others like Gravity Recovery and Climate Experiment Follow On (GRACE-FO), Cyclone Global Navigation Satellite System (CYGNSS), and Ecosystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOSTRESS), among others.

Future Prospects

- **Extended Lifespan Goals:** While initially planned for a 20-month operation, NASA and Intelsat are aiming for an extended functionality of 10-15 years for TEMPO.

- **Precursor for Future Missions:** TEMPO''s success sets the stage for NOAA''s enhanced Atmospheric Composition Instrument, slated for a mid-2030s launch.

TEMPO''s role as part of the EVI program showcases NASA''s commitment to innovative, cost-effective missions focusing on Earth science research and applications, particularly in monitoring and understanding air pollution over North America.

Pantoea Tagorei: Visva-Bharati researchers name a bacteria after Rabindranth Tagore that helps plants.

- It was discovered from soil samples collected in the Jharia coal mines.

Characteristics

- It has unique properties beneficial for plant growth.
- It not only solubilizes potassium but also replenishes nitrogen and solubilizes
- The team has conducted experiments by introducing this bacterium to farmers, who have expressed satisfaction with the positive results.
- Significance: This bacteria marks a significant stride toward fostering environmentally friendly agricultural methods.

Key facts about Rabindranath Tagore:

- He was a world-renowned poet, litterateur, philosopherand Asia's first Nobel laureate.
- He was born in Kolkata on May 7, 1861.
- He was popularly known as Bard of Bengal,and
- He introduced new prose and verse forms and the use of colloquial language into Bengali literature, thereby freeing it from traditional models based on classical Sanskrit.
- He was highly influential in introducing Indian culture to the West and vice versa.
- Awards: In 1913he became the first non-European to receive the Nobel Prize for Literature
- He was awarded a knighthood in 1915, but he repudiated it in 1919 as a protest against the Amritsar (Jallianwala Bagh) Massacre.
- Visva Bharati University, which was known as Shantiniketan founded by Rabindranath Tagore.
- Rabindranath Tagore wrote India''s national anthem, Jana Gana Mana.
- Tagore's most notable work of poetry is Gitanjali: Song Offerings, for which he received the Nobel Prize in Literature in 1913.

INS Kadmatt conducts underway replenishment with Japan"s JS Towada in North Pacific

INS Kadmatt

- It is an **indigenous stealth anti-submarine warfare corvette**.
- It is the second of four anti-submarine warfare corvettes **built for the Indian Navy by** the **Garden Reach Shipbuilders and Engineers of Kolkata** under Project 28.
- It was commissioned into the Indian Navy in January 2016.
- The ship was **inducted into the Eastern Naval Command** of the Indian Navy.
- It has been **named after the Kadmat Island of India"s Lakshadweep Islands.**
- The **primary role** of the INS Kadmatt **is in anti-submarine warfare—to** protect ships in convoys and ports from enemy submarine attacks.
- **Features:**
    - Length: 109 m (358 ft)
    - Beam: 12.8 m (42 ft)
    - Speed: 25 knots (46 km/h)
    - **Range: 3,450 mi (5,550 km)** at 18 knots (33 km/h)
    - **Complement: 180 sailors** and 13 officers
    - The ship is fitted with state-of-the-art weapons, sensors, and machinery and is also **designed to embark on the Sea king anti-submarine helicopter**.
    - The ship also has **on-board early warning**, na**vigation, and fire control radars,** besides **underwater sensors** and integrated communication and electronic warfare systems.
    - It **produces low levels** of radiated underwater **noise, which reduces** its **chances of detection.**
    - It is equipped with anti**aircraft guns, torpedoes, and rocket launchers**.

Navy gets ready for its biggest naval exercise amid ocean engagements

Exercise Milan

- It is a biennial **multilateral naval exercise that began in 1995.**
- It has since significantly expanded in scope and scale to become the largest exercise held by India.
- It was started **with the participation of only four countries**, viz., Indonesia, Singapore, Sri Lanka and Thailand, in the 1995 edition, the exercise has since transitioned leaps and bounds in terms of the number of participants and complexity of exercises.
- Originally conceived in consonance with India"s "**Look East Policy**, MILAN expanded in ensuing years with the Government of **India"s "Act East Policy**" and **Security And Growth for All in the Region (SAGAR)**

initiative to include participation from other Friendly Foreign Countries (FFCs).

- The mid-planning conference of Milan-24 was held in October this year. The last edition of Milan, which is held off the coast of Visakhapatnam, saw participation from over 40 countries.

SAGAR initiative

- It is an **Indian foreign policy doctrine** that was introduced in 2015.
- The aim of SAGAR is to enhance **cooperation and mutual trust between India and its neighbouring countries,** particularly in the Indian Ocean region.
- The SAGAR policy has several components, including ensuring maritime security and safety, promoting sustainable development and economic growth, and strengthening cultural and people-to-people ties between nations.

CRPF deployed at Nagarjunasagar Dam amid Andhra Pradesh and Telangana fight

Nagarjuna Sagar Dam

- It is **built between** the Nalgonda district of **Telangana and** the Guntur district of **Andhra Pradesh.**
- It is built **across the River Krishna**.
- It is the largest and **highest masonry dam in the world.**
- The dam is **150m tall** and 1.6 km long.
- It **derives its name from a nearby hillock** and island **called Nagarjunakonda**, where an ancient Buddhist monk once lived.
- It is also **one of the earliest projects built in post-independence India** for irrigation and hydroelectricity generation.
- The construction of the dam commenced in 1956 and was completed by 1967.
- This dam **supports the national grid with its electric power** and provides irrigation water to five districts, including Khamman District, Nalgonda District, Guntur District, Prakasam District, and Krishna District.
- **As per** the provisions of the **Andhra Pradesh Reorganisation Act, 2014**, Nagarjunasagar **Dam is controlled and supervised by Telangana**.

Defence Acquisition Council approves capital acquisition proposals worth Rs 2.23 lakh crore to enhance the operational capabilities of the Armed Forces

Defence Acquisition Council (DAC):

- DAC is the **highest decision-making body of** the **Defence Ministry on procurement**.
- **Objective**: To ensure **expedited procurement of** the **approved requirements of** the **armed forces.**
- **Formation**: It was formed after the **Group of Ministers"recommendations** on "Reforming the National Security System"**, in 2001, post-Kargil War (1999).**
- **Composition**:
  - The **Defence Minister is the chairman** of DAC.

- Its **members include** the **Chief of Defence Staff** (CDS) and **chiefs of** the **Army, Navy, and Air Force.**

- **Functions**:
  - Give in-principle **approval of** a **15-year Long Term Integrated Perspective Plan** (LTIPP)**for defence forces**.
  - **Accord of acceptance of necessity** to acquisition proposals.
  - **Categorization of the acquisition proposals** relating to **'Buy', 'Buy & Make', and 'Make'.**
  - **Look into issues relating to single vendor clearance**.
  - **Take decisions regarding 'offset' provisions in** respect of acquisition **proposals above Rs 300 crore**.
  - **Take decisions regarding the transfer of technology** under the 'Buy & Make' category of acquisition proposals.

INS Sandhayak: GRSE delivers largest survey vessel built in India on Navy Day
INS Sandhayak

- It is the **largest survey vessel** ever **built in India**.
- It is fully designed and built **by the Garden Reach Shipbuilders and Engineers (GRSE),**
- It is the **first in the series of four** Survey Vessels (Large), or SVLs, **being built by GRSE**.
- It is the reincarnation of another ship by that name. The previous warship, also a survey vessel, was commissioned into the Navy in 1981 and decommissioned in 2021.
- The new INS Sandhayak and the remaining ships in the series are far more advanced than their predecessors.
- **Features:**
  - It is a 110-metre-long ship **propelled by two marine diesel engines** combined with fixed-pitch propellers.
  - It is **fitted with bow and stern thrusters to** help the ships **manoeuvre at low speeds** during surveys.
  - It is **capable of full-scale coastal and deep-water hydrographic surveys** of port and harbour approaches and the determination of navigation channels and routes.
  - It can also undertake **surveys of maritime limits** and the co**llection of oceanographic and geographical data** for defence applications.
  - It can **carry a helicopter**, participate in **low-intensity combat,** and function as a **hospital ship**.
  - It can also be used for humanitarian assistance and disaster relief operations.

Army Deploys Double Humped Camels In Eastern Ladakh
Double Humped Camels

- Double Humped Camels or **Bactrian camels, have two humps** on their backs **where they store fat.**
- **Scientific Name**: **Camelus bactrianus**
- **Distribution**:
  - They are **native to** the harsh and **arid regions of Central Asia.**
  - They occupy habitats in Central Asia **from Afghanistan to China**, primarily **up into the Mongolian steppes and** the **Gobi desert.**
  - **A small population** of Bactrian camels **exists in the Nubra Valley of Ladakh**.
- **Features**:
  - They are up to 10 feet (3.0 m) long and weigh 590-1000 kg.
  - They **are smaller** and slenderer **than the one-humped dromedary camels found** in Africa and the Middle East.
  - Their **fur colour varies from beige to dark brown.**
  - They **have thick, woolly coats** that provide warmth during the cold months and insulation from the desert heat, and they **shed this for the summer months.**
  - **Lifespan: 50 years**
  - They **typically live in herds of 6-20 members**, although they can occasionally be solitary or in groups of up to 30 individuals.
  - **Diet**: They are **omnivores** but are **primarily herbivores** that constantly graze on grasses.

Pilatus PC-7 Mk II crash: 5 things to know about the trainer aircraft

Pilatus PC-7 Mk II

- It is a **trainer aircraft.**
- It is a **low-wing, turbo-prop aircraft** with tandem seating (the cadet sits in the front, the instructor behind him).
- While the original aircraft has been in service since the 1970s, the Mk II version was introduced in the 1990s, with newer airframe and more advanced avionics.
- It is Powered by a **Pratt & Whitney turbo-prop engine**, it **has a maximum speed of 412 km/h** and can fly to a height of slightly more than 10,000 m.
- It has **a range of 1,200 km** without external tanks, which translates to slightly more than 4 hours of flying time.
- There are 75 Pilatus PC-7 Mk II aircraft in service with the IAF.

Trainer aircraft

- A trainer is a class of aircraft **designed specifically to facilitate flight training** of pilots and aircrews.
- Modern military aircraft are notoriously difficult to master for rookie pilots. Hence, they must first be trained on other, more basic aircraft.

- Trainer aircraft are far more forgiving than the aircraft military pilots will eventually fly — they fly slower, have fewer complex systems, and are designed to be resistant to and recoverable from stalls and spins, a common challenge for rookie pilots.
- They **are also much cheaper**, allowing air forces to buy them in bulk to train cadets.

664 crimes against women per million: NCRB data

National Crime Records Bureau (NCRB)

- It was established in 1986 to act as a **repository of information on crime and criminals.**
- It comes **under the Ministry of Home Affairs**(MHA), Government of India.
- It was set up based **on the recommendations of** the **Tandon Committee**, the **National Police Commission** (1977-1981) and the Task Force of the Home Ministry.
- It is responsible for **collecting and analysing crime data** as well as serving as a **repository of such information** to **aid investigators in tracing crimes and criminals**.
- **Headquarters: New Delhi**
- In 2009, the NCRB was entrusted with the responsibility of monitoring, coordination, and **implementing the Crime and Criminal Tracking Network and System (CCTNS) project.** This project connects about 15,000 police stations and 6,000 high offices in the country.
- In 2017, the NCRB **launched the National Digital Police Portal**, which **allows police officers to look for a criminal** or suspect **on the CCTNS database** and **gives citizens** with **services such as online complaint filing**, etc.
- The Bureau has also been entrusted to **maintain the National Database of Sexual Offenders (NDSO)** and **share it with the States**/UTs on a regular basis.
- NCRB has also been designated as **the Central Nodal Agency to manage the** technical and operational functions of the **'Online Cyber-Crime Reporting Portal'** through which any **citizen can lodge a complaint or upload a video clip as evidence** of crime **related to child pornography, rape**/gang rape.
- The NCRB has also **launched CyTrain**, a portal **for online training** of different stakeholders **in cybercrime investigations** and prosecution.
- The **Central Finger Print Bureau under the NCRB** is a national **repository of all fingerprints** in the country.
- NCRB also compiles and **publishes National Crime Statistics** i.e. **Crime in India**, **Accidental Deaths & Suicides,** and also **Prison Statistics**.
- NCRB also assists various States in capacity building in the areas of Information Technology, CCTNS, Finger Prints, Network security, and Digital Forensics through its **training centres in Delhi and Kolkata.**

MeitY organises 40th CISO Deep Dive Training Programme

Cyber Surakshit Bharat Initiative

- It is an **initiative of** the **Ministry of Electronics and Information Technology** (MeitY), Government of India.

- It was conceptualised with the mission **to spread awareness about cybercrime** and **build the capacities of Chief Information Security Officers** (CISOs) **and** frontline **IT officials across all government departments.**
- It is an initiative **to fortify the cyber security system in India** with regard to the Government's vision of a Digital India.
- It was launched **in cooperation with the National e-Governance Division (NeGD) and** various **industry partners** in India.
- It can be entitled as the **first public-private enterprise of its kind**.
- The **partners involved** in the origination of this scheme **include chief IT companies** like Intel, Microsoft, etc.
- **Operation:**
  - It will be operated on **three principles: education, awareness, and enablement.**
  - It will **comprise a program of awareness on** the **importance of cybersecurity**.
  - The scheme will also **include a number of workshops** on the best enablement and practices of the officials with **cybersecurity health tool kits** for the management and mitigation of cyber threats.
  - It will also conduct a number of **training programs** all over the country from time to time, which will be **attended by CISOs and technical officials from the central government, state governments,** PSBs, UTs, PSUs, defence PSUs and **technical arms of the Army, Navy, and Air Force.**
- **Deep-Dive training programme:**
  - It specifically aims at **educating and enabling CISOs to understand cyber-attacks and get the necessary exposure to the latest technologies** for safeguarding e-infrastructure.
  - The training focuses on providing a holistic **view of legal provisions**, **enabling** CISOs to **formulate policies for cybersecurity** and build concrete cyber crisis management plans.

National Automated Fingerprint Identification System Established at 1022 Locations, Says Home Ministry

National Automated Fingerprint Identification System (NAFIS):

- It is a **pan-India searchable database**of crime and criminal-related fingerprints.
- It is managed by the **Central Fingerprint Bureau** at the National Crime Records Bureau (NCRB), based in New Delhi.
- It functions as a central information repository by consolidating fingerprint data from all states and Union Territories.
- It enables law enforcement agencies to upload, trace, and retrieve data from the database in real time on a **24×7 basis**.

- With the help of this it is possible to locate a person of interest in a matter of minutes and connect that individual's name to any active warrants, warnings, or information about related criminal conduct stored in other police information reference systems.
- **Working of NAFIS:**
  - It assigns a unique **10-digit National Fingerprint Number** for each criminal, based on biometrics.
  - The unique ID will be used for a **lifetime of an offender**. Different crimes registered under different FIRs will be logged as incidents belonging to the same National Fingerprint Number.
  - The first two digits of the ID will be the state code of the state where the criminal is registered, followed by a sequence number.
  - The state partition will have IDs belonging to a state

Anti-collision system Kavach deployed on 1465 Route km, 139 locomotives, work underway in major corridors

Kavach' System:

- It is an indigenously developed **Automatic Train Protection (ATP) system.**
- It was developed by the **Research Design and Standards Organisation (RDSO)** under the Indian Railway (IR) in collaboration with the Indian industry.
- It is a set of electronic devices and Radio Frequency Identification devices installed in locomotives, in the signalling system, as well the tracks, that talk to each other using ultra-high radio frequencies to control the brakes of trains and also alert drivers, all based on the logic programmed into them.
- Since 2016, the railways have been carrying out field tests for Kavach on passenger trains.
- **Applications:**
  - It is meant to provide protection by preventing trains from passing the signal at Red (which marks danger) and avoiding collisions.
  - The system can alert the loco pilot, take control of the brakes, and bring the train to a halt automatically when it notices another train on the same line within a prescribed distance.
  - The device also continuously relays the signals ahead to the locomotive, making it useful for loco pilots in low visibility.
  - It also controls the speed of the train through an automatic application of brakes in case the loco pilot fails to do so.

- It helps the loco pilot in run the train during inclement weather conditions, such as dense fog.
- An added feature is the centralised live monitoring of train movements through the Network Monitor System.

Union Raksha Rajya Mantri informed Lok Sabha that 16 defence technologies have been successfully developed/realised under the Technology Development Fund (TDF) scheme.

Technology Development Fund (TDF) scheme:

- It is a flagship programme of **Ministry of Defence** executed by **Defence Research and Development Organisation** (DRDO) under 'Make in India' initiative.
- The main objectives of the scheme are:
- To provide **Grant in Aid to Indian industries**, including MSMEs and Start-ups, as well as academic and scientific institutions for the development of Defence and dual use technologies that are currently not available with the Indian defence Industry.
- To **engage with the private industries** especially MSMEs and Start-ups to bring in the culture of Design & Development of Military Technology and support them with Grant in Aid.
- To focus on **Research, Design & Development** of Niche technologies which are being developed for the first time in the country.
- To create a bridge amongst the Armed Forces, research organizations, academia and qualifying/certifying agencies with private sector entities.
- To support the **futuristic technologies** having a Proof of Concept and converting them into prototype.
- **Funding Support:**
- The funding will be through provision of **grants to the Industry**.
- The project cost of **up to INR 10 Cr** will be considered for funding, subject to a maximum of 90% of the total project cost.
- Industry may work in collaboration with academia or research institutions.
- The work involvement of academia cannot exceed 40% of the total project cost.
- **Project Duration:** Maximum development period will be two years.

Missile testing paused in Odisha to save sea turtles

Wheeler Island

- **Abdul Kalam Island**, formerly known as Wheeler Island, is an island **off the coast of Odisha.**
- The island was **renamed to honour the late President Dr. APJ Abdul Kalam** and also to encourage the youth to pursue a scientific temperament.

- It is the **only place in India that has an integrated test range** maintaining a **missile testing facility,** which is located on this island.
- **All indigenous missiles,** like Akash missile, Agni missile, Prithvi Missile etc. **are tested from here.**
- The **island is 2 km long, having an area of 390 acres,** and is basically a s**oil formation without rocks** in the Bay of Bengal.

Defence Research Development Organisation (DRDO):

- It is the **R&D wing of the Ministry of Defence**, Govt of India, with a vision to empower India with cutting-edge defence technologies and a mission to achieve self-reliance in critical defence technologies and systems.
- It is**India"s largest research organisation.**
- **Formation**: The organisation was formed in 1958 from the amalgamation of the then already functioning Technical Development Establishment (TDEs) of the Indian Army and the Directorate of Technical Development & Production (DTDP) with the Defence Science Organisation (DSO).
- **Headquarters: New Delhi.**
- It **has a network of laboratories engaged in developing defence technologies** covering various fields, like aeronautics, armaments, electronics, land combat engineering, life sciences, materials, missiles, and naval systems.

Indian Armed Forces contingent comprising 45 personnel reached Hanoi, Vietnam to take part in the Joint Military Exercise VINBAX-2023.

Exercise VINBAX-2023

- It was **instituted in 2018** and the **first edition** was conducted at Jabalpur, Madhya Pradesh.
- It is an annual training event conducted **alternatively in India and Vietnam**.
- Last edition was conducted at **Chandimandir** Military Station in August 2022.
- This year's exercise will be conducted at **Hanoi, Vietnam**.
- The Indian contingent comprises 39 personnel from an **Engineer Regiment** of Bengal Engineer Group and six personnel of **Army Medical Corps** are participating.
- Aim of the exercise is to **foster collaborative partnership**, promote inter-operability and share best practices between the two sides under Chapter VII of United Nations Charter on Peacekeeping Operations.
- The exercise will be conducted as a Command Post Exercise cum Field Training Exercise with focus on deployment and employment of an Engineer Company and a Medical Team.
- Both sides will conduct technical military operations in accordance with scenarios akin to worldwide deployment of United Nations' contingents

Karrar combat drones

- Iran has unveiled advanced Karrar combat drones armed with air-to-air missiles, enhancing its air defence capabilities.

- Dozens of Karrar drones with an operational range of up to 1,000 kilometres will be deployed along the country''s borders.
- **Majid Air-to-Air Missiles:** The Karrar interceptor drone, initially introduced in 2010, now incorporates the ''Majid'' thermal missile, which reportedly has an eight-kilometer range. This missile was developed entirely within Iran.

Concerns Over Iran''s Military Developments

- Various nations, particularly the United States and Israel, have expressed **concerns regarding Iran''s continuous development of its military arsenal**, dating back to the 1980s, initially stemming from its war with Iraq.
- There are allegations that **Iran is supporting allies in the Middle East and supplying drones to groups like Hezbollah in Lebanon and Houthi rebels in Yemen**.
- Additionally, there are accusations, which Iran denies, of **supplying drones to Russia for use in the Ukraine conflict**.
- In response to these alleged arms sales, **Western governments have imposed multiple rounds of sanctions on Iran.**

Karrar

- The HESA Karrar is an **Iranian jet-powered target drone manufactured by Iran Aircraft Manufacturing Industrial Company (HESA) since 2010.**
- Derived from the American Beechcraft MQM-107 Streaker target drone, and potentially incorporating elements from the South African Skua, it was developed during the Ahmadinejad presidency.

Design and Features:

- **Physical Structure:** The Karrar features a small, clipped delta wing, a cylindrical, blunt-nosed fuselage, and twin arrowhead-shaped tailfins. It has a dorsal air intake for the engine and utilizes a rocket-assist system for takeoff, recovered by a parachute.
- **Capabilities:** While it''s used primarily as a target drone for air-defense crew training, reports suggest it has evolved to carry armaments such as the Shahab-e-Saqeb missile and the Majid heat-seeking missile, extending its functionality to hitting air targets.
- **Flight Characteristics:** Capable of high and low altitude flight, day and night operation, and following pre-programmed flight paths or updated instructions during flight. It''s purported to have an autopilot system with INS and/or GPS guidance and may possess terrain-following capabilities.
- **Payload:** The Karrar can carry a range of armaments, including bombs like the Mk 82 general-purpose bomb, anti-ship missiles such as the Nasr-1 or Kowsar, and satellite-guided glide bombs like the Balaban.

Operational History:

- **Unveiling:** Unveiled in 2010 by Iranian President Mahmoud Ahmadinejad, it was presented as a "long-range bomber drone," considered Iran''s first long-range UAV.
- **Export and Use:** Reports indicate its export to groups like Hezbollah and its deployment in conflicts like the Syrian Civil War. It''s been used in training exercises for various air defense systems and weapons.

- **Debate on Capability:** While Iranian sources tout its weapon deployment capabilities, some analysts question these claims, suggesting it''s primarily a target drone.
- **Ongoing Use:** The Karrar continues to be employed in Iran''s air defense force training, frequently utilized to test various surface-to-air missile systems and air-to-air missiles.

The unveiling of these advanced combat drones equipped with air-to-air missiles marks a significant development in Iran''s defense capabilities, prompting international attention and raising concerns among some nations regarding the implications of Iran''s military advancements and alleged arms dealings in the Middle East and beyond.

Autonomous Flying Wing Technology Demonstrator

The successful flight trial of the Autonomous Flying Wing Technology Demonstrator by the Defence Research and Development Organisation (DRDO) is a momentous achievement in India''s aeronautical advancement.

- **Technology Mastery:** The flight trial marks **India''s entry into an exclusive league of nations capable of maneuvering flying wing technology** in a tailless configuration, demonstrating exceptional control and proficiency in this specialized field.
- **Development Origins:** The UAV was **conceived and crafted by DRDO''s Aeronautical Development Establishment**. The journey began with its maiden flight in July 2022, followed by a series of six meticulously planned flight trials.
- **Design and Material Excellence:** The aircraft''s construction utilized **lightweight carbon prepreg composite material**, a remarkable display of India''s indigenous expertise in aerospace technology.
- **Autonomous Features:** The UAV demonstrated autonomous landing capabilities without relying on ground radars, infrastructure, or human pilots. Its unique ability to take off and land from runways with **pinpoint accuracy was facilitated by sensor data fusion and GPS Aided GEO Augmented Navigation (GAGAN) receivers**, ensuring precise navigation.
- **Technological Sovereignty:** India''s adeptness in developing cutting-edge technology like the Autonomous Flying Wing UAV signifies a significant leap towards self-sufficiency and technological sovereignty in the realm of advanced aerospace technology.

Flying-wing UAVs

- They represent a unique and advanced category of unmanned aircraft characterized by their distinct wing design, which merges the body of the aircraft into a single, wing-shaped structure, without any separate tail or fuselage.
- These UAVs are engineered to provide a myriad of applications across various fields due to their innovative design and versatile capabilities.

Design and Features:

- **Wing Configuration:** The most prominent feature of a flying-wing UAV is its wing configuration, which is the primary structure and contributes to both lift and stability.

- **Stealth and Low Radar Signature:** The design of flying-wing UAVs often aims for reduced radar cross-section, providing stealth characteristics that make them less detectable by radar systems.
- **Payload Capacity:** These UAVs can accommodate various payload configurations, including sensors, cameras, communication devices, and sometimes even weapons, depending on the intended purpose.
- **Long-Endurance Flight:** Due to their efficient aerodynamics, flying-wing UAVs can achieve extended flight times and long endurance, making them suitable for surveillance, reconnaissance, and monitoring missions.
- **Control Systems:** Advanced control systems and fly-by-wire technology ensure stability and precise control, enabling autonomous or remotely piloted flights.

Applications:

- **Surveillance and Reconnaissance:** Flying-wing UAVs excel in intelligence gathering, surveillance, and reconnaissance missions. Their stealthy design and endurance capabilities make them suitable for long-duration aerial surveillance tasks.
- **Military Operations:** They have applications in military scenarios for reconnaissance, target acquisition, and potential deployment as combat drones.
- **Civilian Uses:** In civilian domains, they find use in environmental monitoring, disaster management, agriculture, and infrastructure inspection.
- **Communications Relay:** Some variants serve as high-altitude communications relays for extending network coverage or supporting communication in remote areas.
- **Research and Development:** Flying-wing UAVs are also employed in research and development for advancing aerospace technology and testing new aerodynamic designs.

Flying-wing UAVs represent a cutting-edge evolution in unmanned aerial technology, offering a blend of stealth, endurance, and adaptability for diverse applications across military, civilian, and research sectors. Further advancements in design, control systems, and regulatory frameworks will continue to shape their role in the future of aerial operations and technological innovation.

INS Tarmugli

INS Tarmugli, a Fast Attack Craft has been commissioned into the Navy at a ceremony held at Naval Dockyard, Visakhapatnam.

- **Name and Class:** INS Tarmugli, a Trinkat Class Fast Attack Craft (FAC).
- **Initial Gift:** The vessel was initially gifted to the Maldivian Naval Defence Forces (MNDF) by India in 2006.
- **Return and Restoration:** The ship returned in May and underwent extensive restoration at the Naval Dockyard, Visakhapatnam.
- **Features and Capabilities:**
- Advanced MTU engines and water jet propulsion.
- Latest communication equipment and an advanced radar system.
- Fitted with a 30 mm gun for defense purposes.
- **Purpose and Functionality:**

- **Role:**Primarily intended for coastal surveillance.
- **Area of Operations:**Protection of Offshore Development Areas (ODAs) in the KG Basin area and the East Coast.
- **Operational Command:**Under the Naval Officer-in-Charge (Andhra Pradesh).
- **Speed and Capacity:**
    - 320-tonne vessel measuring 48 meters in length.
    - Capable of achieving speeds in excess of 30 knots.

- **Strategic Importance:**Vital for maritime security and defense operations.
- **Naming Tradition:**Named after a picturesque island in the Andaman group.

Trinkat-class patrol vessels

Role:

- **Functions:** Fisheries protection, anti-poaching, counter-insurgency, and search-and-rescue operations.
- **Operational Area:** Primarily in coastal areas and the exclusive economic zone.
- **Naming Convention:** Named after islands from the Andaman and Nicobar Islands or the Lakshadweep Islands.

Ships in Class:

- **Trinkat (T61):**
- **Homeport:**Port Blair
- **Commissioned:**28 September 2000
- **Status:**Active
- **Tillanchang (Now INS Tarmugli - T62):**
- **Commissioned:**17 March 2001
- **Transferred:**To the Maldivian Coast Guard in April 2006 as MCGS Huravee.
- **Decommissioned:**2 May 2023 and transferred back to India.
- **Recommissioned:**As INS Tarmugli on 14 December 2023 after refit.
- **Tarasa (T63):**
- **Commissioned:**24 August 2001
- **Transferred:**To Seychelles Coast Guard in November 2014 as PS Constant.
- **Tarmugli (T64):**
- **Commissioned:**4 March 2002
- **Transferred:**To Seychelles Coast Guard in February 2005 as SCG PS Topaz.

Replacements:

- **Newer Ships:** Garden Reach Shipbuilders and Engineers developed replacements for the older vessels, known as the Car Nicobar-class patrol vessels.
- **Launch Dates:**
- New INS Tarasa (T94) launched in June 2016.
- New INS Tillanchang (T92) commissioned in March 2017.
- New INS Tarmugli (T91) commissioned in May 2016.

Recent Developments:

- New INS Tarmugli (T91) donated to the Maldives in May 2023.
- Older MCGS Huravee (formerly INS Tillanchang) transferred back to India.
- INS Tarmugli (formerly Tillanchang) was refitted and recommissioned into the Indian Navy on 14 December 2023.

FAC

- Fast Attack Craft (FAC) is a type of small, agile, and highly maneuverable naval vessel designed primarily for offensive and defensive operations in littoral or coastal areas.
- These crafts are built for speed, flexibility, and rapid response, often playing a crucial role in coastal defense, patrolling, escort duties, anti-submarine warfare, and protection of larger naval vessels.

Design and Characteristics:

- **Size and Construction:**
- Typically small in size, ranging from around 20 meters to 50 meters in length, allowing for high maneuverability and speed.
- Lightweight construction using advanced materials, such as aluminum or composites, for speed and agility.
- **Speed and Maneuverability:**
- Emphasis on high speed, capable of reaching and sustaining speeds often exceeding 40 knots.
- Swift acceleration and quick turning capabilities for rapid response and evasion of threats.
- **Armament and Payload:**
- Mounts a variety of offensive weaponry, such as naval guns, surface-to-surface missiles, anti-ship missiles, torpedoes, and close-in weapon systems (CIWS).
- May also carry electronic warfare systems, decoys, and small unmanned aerial or surface vehicles.
- **Stealth and Survivability:**
- Some designs incorporate stealth features, reduced radar signature, and advanced sensor technologies.
- Countermeasures against threats include sophisticated electronic warfare suites and defensive systems.

Roles and Missions:

- **Coastal Defense:**

- Protecting territorial waters by patrolling and monitoring activities in coastal areas.
- Providing rapid response to threats such as piracy, smuggling, and intrusions by hostile forces.
- **Escort and Protection:**
- Escorting larger naval vessels or convoys, safeguarding them against surface and subsurface threats.
- **Anti-Submarine Warfare (ASW):**
- Engaging and countering enemy submarines using torpedoes and other ASW weapons.
- **Surveillance and Reconnaissance:**
- Conducting surveillance missions to gather intelligence and monitor maritime activities.

Global Use:

- **United States Navy (USN):**
- The Cyclone-class patrol ships, serving in littoral areas, providing fleet support, and executing maritime security operations.
- **Russian Navy:**
- The Tarantul-class missile corvettes, designed for anti-ship warfare and used for coastal defense and convoy escort.
- **Indian Navy:**
- The Abhay-class corvettes, optimized for shallow water operations and anti-submarine warfare in littoral regions.
- **Chinese Navy (PLAN):**
- Utilizes various classes of missile boats and fast attack crafts for coastal defense and regional security.

The Trinkat-class and its replacements, the Car Nicobar-class patrol vessels, signify India''s commitment to maritime security, exemplified by their roles in various critical operations in coastal regions and EEZs. The recent recommissioning of INS Tarmugli is a testament to the Navy''s consistent efforts in bolstering its fleet for national defense and coastal security.

DRDO Achieves Milestone: Key Points on India''s Successful Flight Test of High-Speed Flying-Wing UAV

- **Significant Milestone:**

- DRDO achieves a milestone with a successful flight trial of the Autonomous Flying Wing Technology Demonstrator, a high-speed flying-wing UAV.

- **Elite Club Entry:**
  - India joins an elite group of countries mastering flying wing technology controls.
  - Successful demonstration in Karnataka's Chitradurga showcases technological readiness.
- **Development by DRDO:**
  - UAV designed and developed by DRDO's Aeronautical Development Establishment.
  - Signifies a leap in India's aerospace capabilities.
- **Commendation from Defence Minister:**
  - Defence Minister Rajnath Singh commends DRDO, armed forces, and the industry for the successful flight trial.
  - Emphasis on strengthening armed forces through indigenous critical technology development.
- **Flight Trials and Advancements:**
  - Maiden flight in July 2022 followed by six subsequent trials in various configurations.
  - Advancements in aerodynamics, control systems, real-time simulation, hardware-in-loop simulation, and ground control stations.
- **Aerospace Technology Showcase:**
  - UAV prototype features an arrowhead wing platform made from lightweight carbon prepreg composite material.
  - Demonstrates "Aatmanirbharta" (self-reliance) in aerospace technology.
- **Autonomous Landing Capacity:**
  - UAV boasts autonomous landing capability, eliminating the need for ground radars, infrastructure, or a pilot.
  - Take-off and landing possible from any runway with surveyed coordinates.
- **Unique Landing Features:**
  - Autonomous landing achieved through onboard sensor data fusion.
  - Indigenous satellite-based augmentation using GPS-aided and GEO Augmented Navigation (GAGAN) receivers enhances navigation accuracy and integrity.

BEL Secures Rs.4,522 Crore Order from Indian Army

- **Major Order for Bharat Electronics Limited (BEL):**
  - BEL clinches a significant order worth Rs.4,522 crore from the Indian Army, highlighting its crucial role in defense manufacturing.
- **Supply of Fuses for Various Calibres:**
  - The order involves the supply of fuses for various calibres, showcasing BEL"s commitment to meeting critical defense requirements.
- **Atmanirbhar Bharat Initiative:**

- BEL''s collaboration with Indian Electronics and associated Industries, including MSMEs, aligns with the "Atmanirbhar Bharat'' initiative, emphasizing self-reliance in defense technologies.

- **Official Contract Signing:**
  - Contract signed on December 15, 2023, by Maj Gen Gurpreet Singh Choudhary (JS Army and TA/DMA) and Bhanu Prakash Srivastava, CMD, BEL, in the presence of Vice Admiral Atul Anand.
- **Inclusion of MSMEs in the Project:**
  - The project involves the collaboration of MSMEs and electronic industries, fostering a collaborative and inclusive approach to defense manufacturing.
- **Diversification of Orders:**
  - BEL secures additional orders valued at Rs.356 crores, covering Electronic Warfare Testers, Medical Systems, Consumables for EVMs, Night Vision Devices Spares, and more.
- **Cumulative Orders in FY 2023-24:**
  - BEL''s cumulative orders for the current financial year reach Rs.23,176 crores, showcasing the company''s robust performance and vital role in enhancing India''s defense capabilities.

Vijay Diwas 2023: Commemorating India''s Victory in the 1971 War

Date and Occasion:

- Vijay Diwas is observed on December 16 every year.
- Commemorates India''s triumph in the 1971 war against Pakistan.

- **Historical Background:**
  - Rooted in oppressive actions by the Pakistani military regime led by General Yahya Khan.
  - Genocide in East Pakistan following the 1970 elections won by the Awami League.
  - Indian intervention under Prime Minister Indira Gandhi to shelter refugees.
- **Initiation of War:**
  - December 3, 1971: Pakistan''s air strikes on Indian airbases.
  - Prime Minister Indira Gandhi instructs General Sam Manekshaw to initiate a full-scale war
- **Military Operations:**
  - Execution of ''Operation Trident'' targeting the Karachi Port.
  - Support to Bangladeshi nationalist groups.
  - 13 days of intense conflict leading to the surrender of General Niazi and 93,000 soldiers.
- **Surrender and Implications:**
  - General Niazi''s surrender marked a significant military event post-World War II.
  - Resulted in the creation of Bangladesh.
- **Commemoration and Significance:**

- Vijay Diwas is a day dedicated to honoring soldiers who sacrificed their lives.
- Symbolizes courage, unity, and the indomitable spirit of the armed forces.
- Holds cultural and political significance, emphasizing strong ties between India and Bangladesh.

- **Celebrations and Observances:**
  - Marked by parades and significant events in India and Bangladesh.
  - Serves as a reminder of shared history and enduring spirit of cooperation between the two nations.
- **Legacy and Inspiration:**
  - Inspires generations, fostering patriotism and pride in the hearts of citizens.
  - Symbolizes India''s celebrated emergence during the 1971 war.
- **Conclusion:**
  - Vijay Diwas 2023 continues to be a day of reflection, tribute, and celebration, highlighting the valor and sacrifices of the armed forces and the enduring friendship between India and Bangladesh.

India Deploys Counter UAV Systems At Military Installations Fearing Suicide Drone Attack

The Indian Air Force (IAF) has **initiated plans to counter the increasing threat posed by unmanned aerial systems (UAS) by issuing Requests for Proposals (RFPs) for various counter-drone systems.**

- These systems are designed to address different operational scenarios, particularly the challenge presented by multiple swarm drones.

Counter Unmanned Aircraft Systems (C-UAS)

- The C-UAS systems are intended to offer a comprehensive solution for detecting, tracking, identifying, designating, jamming, and neutralizing multiple threats simultaneously.
- Key features include:
- **Multi-sensor Capability**: Providing a comprehensive air situation picture using various sensors.
- **Vehicle-Mounted System**: Offering mobility for deployment in different operational areas.
- **No-Fly Zone Enforcement**: Intercepting identified threats and preventing unauthorized UAS intrusion.
- **Recognition of Unknown UAS**: Generating alerts based on user-defined parameters.

Micro Munitions Systems (MMS)

- These systems are designed to combat swarm drones attacking IAF bases from multiple directions.

- Key attributes of the MMS include:
- **Guided Munition System**: Capable of deploying multiple guided munitions laterally to counter swarms.
- **Mobile Delivery Vehicle**: Equipped with radar-controlled platforms launching 128 guided missiles per launch.
- **Multi-Directional Engagement**: Ability to launch missiles in various directions simultaneously.

Kamikaze Drone Systems (KDS)

- The KDS, also mounted on vehicles, aims to counter multiple swarm drones by utilizing satellite navigation-based flight and communication links.
- Notable features include:
- **Satellite Navigation-Based System**: Utilizing flight and communication links for drone control.
- **Explosive-Laden Kamikaze Drones**: Directing drones towards detected swarm drones to neutralize them by crashing into them.
- **Comprehensive Air Situation Picture**: Using radar and radio frequency detectors for detection, tracking, and neutralization.

Common Requirements for all Systems

- Integration with existing air defense and communication networks, anti-drone measures, and close-in weapon systems of the IAF.
- Deployment flexibility on rooftops or unprepared locations.
- All-weather capability and functionality at altitudes of up to 16,000 feet, ensuring nationwide deployment.

Swarm drones

- Swarm drones, also known as drone swarms or unmanned aerial vehicle (UAV) swarms, represent a groundbreaking approach to aerial operations.
- These systems **consist of multiple drones working together in a coordinated manner to achieve various objectives.**

Technology behind Swarm Drones:

Swarm Control and Communication:

- **Swarm Algorithms**: These are essential for controlling the behavior of individual drones within the swarm and ensuring coordination.
- **Communication Protocols**: Efficient communication is crucial. Drones can communicate directly or through a central system like a ground station or a leader drone.
- **Decentralized Control**: Swarm drones often use decentralized decision-making processes to enhance adaptability and resilience.

Sensing and Perception:

- **Sensors**: Drones are equipped with various sensors (e.g., cameras, LiDAR, GPS) for navigation, obstacle detection, and situational awareness.

- **Computer Vision**: Enables drones to recognize and track objects, people, or terrain features, aiding in navigation and mission execution.
- **Machine Learning and AI**: Algorithms enable drones to learn, adapt, and make autonomous decisions based on incoming data.

Swarm Formation and Coordination:

- **Formation Flying**: Algorithms enable drones to maintain specific formations for different purposes, like maximizing coverage or minimizing vulnerability.
- **Collaborative Tasks**: Drones can collaborate to perform tasks collectively, such as mapping an area, delivering payloads, or conducting surveillance.

Applications of Swarm Drones:

Military and Defense:

- **Surveillance and Reconnaissance**: Swarm drones can cover vast areas, gather intelligence, and monitor enemy movements.
- **Target Identification and Attack**: They can identify and engage targets collectively, enhancing precision and efficiency.
- **Electronic Warfare**: Swarm drones can disrupt enemy communication systems or provide electronic support.

Civilian and Commercial:

- **Search and Rescue**: Swarm drones can cover large areas quickly, aiding in locating missing persons or disaster-stricken areas.
- **Agriculture**: They assist in crop monitoring, spraying pesticides, and assessing field conditions.
- **Entertainment and Light Shows**: Used for spectacular aerial displays during events and celebrations.

Infrastructure and Maintenance:

- **Inspections**: Swarm drones can inspect infrastructure like pipelines, power lines, and buildings more efficiently.
- **Construction**: They might assist in tasks like 3D mapping, material transport, and building maintenance.

Indian scenario:

- Several Indian startups and organizations have made notable strides in developing indigenous swarm drones capable of surveillance and performing attack missions.

Winners of Indian Air Force Swarm Drone Competition:

- **NewSpace Research & Technologies Pvt Ltd**: Led by former IAF officer Sameer Joshi, NewSpace won the "swarm architecture" award in the Indian Air Force"s competition. They secured a significant USD 15 million swarm drone order from the Indian Army. Hindustan Aeronautics Ltd. is supporting NewSpace in developing these drones.
- **Flaire Unmanned Systems Pvt. Ltd. (Incubated by Delhi Technology University)**: This team partnered with Adani Defence and won the "communication architecture" award in the competition.
- **Dhaksha Unmanned Systems**: Awarded the "drone architecture" award in the competition, showcasing their expertise in designing advanced drone architectures.

DRDO"s Swarm Drone Technology Showcase:

- In November 2021, the Defense Research and Development Organisation (DRDO) showcased armed swarm technology designed for minimal human intervention.
- These drones are designed to operate in high-altitude regions, rough weather conditions, and boast a speed of 100 km/h.
- Notably, they possess the capability to strike multiple drones at a target, enhancing their effectiveness in combat scenarios.

Indian Air Force Initiatives:

- The Indian Air Force launched the Mehar Baba Swarm Drone Competition in 2018 to promote drone development.
- This three-year-long competition aimed to encourage different organizations to innovate and contribute to the advancement of swarm drone technology.

International Examples of Swarm Drone Deployment:

- The use of swarm drones has also been demonstrated on the international stage, notably by the Israeli Defence Forces.
- They utilized swarm drones to locate rocket launchers situated in Gaza, showcasing the effectiveness of these technologies in reconnaissance and target identification.

The development and acquisition of these systems underscore the IAF"s proactive approach in countering evolving threats from unmanned aerial systems, particularly swarm drones, and aim to bolster India"s defense capabilities against such threats in varied operational environments. These counter-drone systems represent a concerted effort to harness technology to safeguard against the growing challenges posed by drones in military and security contexts.

India receives two "Romeo" helicopters

Indian Navy has **received the sixth MH-60R "Romeo" helicopter from Lockheed Martin**.

- The company expects to complete the delivery of all the MH-60R choppers that India ordered by 2025.

Procurement and Specifications

- **Acquisition and Cost**: India signed a contract to acquire 24 MH-60R helicopters from the United States for $2.6 billion. The deal includes India-specific modifications and weaponry, such as Hellfire air-to-surface missiles and Mark 54 anti-submarine torpedoes.
- **Operational Range and Capabilities**:

- The MH-60R Seahawk is renowned for its multi-role capabilities, ranging from anti-submarine warfare (ASW) to maritime surveillance, anti-smuggling, anti-piracy, and search-and-rescue missions.
- Equipped with advanced sensors, systems, and weapons, the helicopter provides a comprehensive and versatile platform for various naval operations.

Deployment and Operational Significance

- **Aircraft Carrier Operations**:
- These helicopters are intended to be deployed on India''s aircraft carrier INS Vikramaditya, significantly enhancing its aerial capabilities.
- Successful landings of MH-60R helicopters on indigenously built aircraft carrier INS Vikrant and destroyer INS Kolkata demonstrate their compatibility and readiness for carrier-based operations.
- **Strategic Maritime Security**:
- The induction of MH-60R helicopters enhances India''s maritime security posture by significantly boosting the Navy''s anti-submarine and anti-surface warfare capabilities.
- The helicopters play a pivotal role in patrolling critical maritime zones, safeguarding territorial waters, and countering maritime threats.
- **Versatility and Operational Flexibility**:
- The MH-60R''s adaptability for various missions ensures operational flexibility, making it an asset for combating diverse maritime challenges, including piracy, smuggling, and search-and-rescue operations.

Indigenous Integration and Future Plans

- **India-Specific Modifications**:
- The helicopters are undergoing India-specific modifications, likely tailored to suit the Indian Navy''s operational requirements and maritime environment.
- **Strategic Partnership with the United States**:
- The procurement underscores the strategic partnership between India and the United States in defense cooperation, providing India with access to advanced military technology and equipment.
- The MH-60R Seahawk helicopter, commonly known as the "Romeo," is a versatile and advanced maritime helicopter primarily operated by the United States Navy (USN).
- It serves as a multi-mission platform designed for anti-submarine warfare (ASW), anti-surface warfare (ASuW), search and rescue (SAR), and intelligence, surveillance, and reconnaissance (ISR) missions.

Design and Capabilities:

- **Variant of Sikorsky"s Seahawk Helicopter**: The MH-60R is derived from the Sikorsky S-70B Seahawk and is built by Sikorsky Aircraft Corporation, now a part of Lockheed Martin.
- **Advanced Sensors and Systems**:
- The helicopter is equipped with state-of-the-art sensors and systems, including the AN/APY-9 radar, sonobuoys, acoustic sensors, electronic support measures (ESM), and radar warning receiver (RWR), enabling comprehensive surveillance and threat detection capabilities.
- **Weapons and Armament**:
- It carries a range of advanced weapons, such as Hellfire missiles, Mark 54 torpedoes, and precision-guided rockets, making it effective in both anti-submarine and anti-surface warfare operations.
- **Multi-Mission Capabilities**:
- The MH-60R"s versatility allows it to conduct various missions, including anti-submarine warfare, anti-surface warfare, search and rescue, medical evacuation, and maritime surveillance.

Operational Features:

- **Enhanced Maritime Surveillance**:
- Its advanced sensor suite allows for effective monitoring of surface vessels and submarines, detecting and tracking potential threats in maritime environments.
- **Anti-Submarine Warfare (ASW)**:
- Equipped with sophisticated sonar systems, it can detect and engage submarines using torpedoes and depth charges.
- **Anti-Surface Warfare (ASuW)**:
- Capable of engaging and neutralizing surface threats with precision-guided missiles and rockets.
- **Search and Rescue (SAR)**:
- Its capacity for medical evacuation and SAR operations makes it an asset in saving lives during maritime emergencies.

International Deployment:

- **International Operators**:
- Apart from the US Navy, several other countries operate or have ordered the MH-60R for their naval fleets, including Australia, Denmark, Saudi Arabia, India, and others.
- **Modernization and Upgrades**:

- Continuous upgrades and modernization programs ensure that the MH-60R remains at the forefront of maritime helicopter technology, incorporating new sensors, weapons, and systems.

The induction of MH-60R Seahawk helicopters represents a significant leap in India''s maritime capabilities, particularly in anti-submarine warfare and multi-role naval operations. Their deployment on aircraft carriers and other naval assets reinforces India''s commitment to enhancing maritime security and signifies a vital step towards bolstering its naval force in the Indian Ocean Region.