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INDEX

Zinc-Ion Batteries

News: Bengaluru scientists have developed a new cathode material that boosts the energy density and stability of eco-friendly zinc-ion batteries, offering a promising alternative to lithium-ion batteries.

About Zinc-Ion Batteries

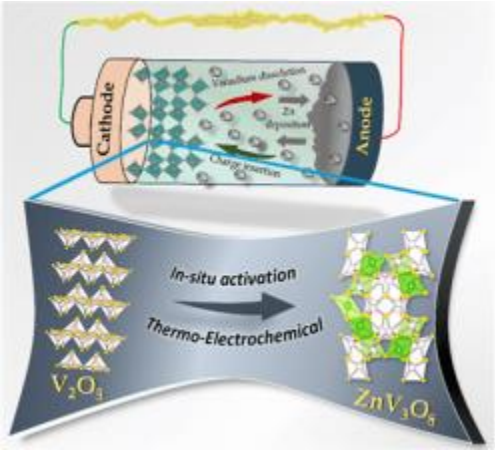


Figure 1. Source: PIB

- Zinc-ion batteries (ZIBs) are rechargeable energy storage devices that use zinc ions (Zn^{2+}) to transfer charge between the electrodes.
- Components and Working Mechanism
  - Anode: The anode in a zinc-ion battery is composed of metallic zinc, which serves as the source of zinc ions during discharge.
  - Cathode: The cathode is generally made from materials such as manganese oxides or vanadium oxides, both of which can reversibly intercalate zinc ions.
  - The electrolyte is a zinc-containing aqueous solution that conducts zinc ions between the anode and cathode.
  - During discharge, zinc metal at the anode is oxidized into zinc ions, which then move through the electrolyte and insert into the cathode material.
  - During charging, zinc ions migrate back to the anode and are reduced to metallic zinc, restoring the battery to its charged state.
- Advantages of Zinc-Ion Batteries
  - Zinc-ion batteries are cost-effective because zinc is abundant, inexpensive, and widely available, which helps reduce production costs.
  - They provide enhanced safety since aqueous electrolytes eliminate the fire and explosion risks commonly associated with lithium-ion batteries.
  - ZIBs are environmentally friendly and generate fewer harmful by products during manufacturing, usage, and disposal.
  - They offer high volumetric energy density, enabling them to store a significant amount of energy within a compact design.
  - Due to recent technological improvements, these batteries can now achieve long cycle life, with some systems lasting thousands of charge–discharge cycles with minimal degradation.

Recent Breakthrough

- The scientists have made a major advancement in improving cathode performance for ZIBs.
- The research team developed a simple thermo-electrochemical activation technique that modifies the structure of the common cathode material vanadium oxide (V_2O_5).
- This process creates beneficial defects within the material, transforming it into zinc–vanadium oxide (Zn-V_2O_5), which provides more pathways and active sites for zinc-ion movement.
- The modified cathode demonstrates significantly improved energy density, enhanced structural stability, and faster ion transport, all of which contribute to more efficient and longer-lasting ZIBs.
- The activated Zn-V_2O_5 material allows the battery to be recharged thousands of times with minimal performance loss, solving a long-standing problem in zinc-ion battery development.

- Researchers noted that this simple activation strategy could also be applied to other cathode materials, potentially accelerating the development of greener and more efficient energy storage technologies.

UAE Just Transition Work Programme (JTWP)

News: At COP30 in Belem, Brazil, the UAE Just Transition Work Programme (JTWP) formally adopted a new Just Transition Mechanism (JTM) to support countries in transitioning away from fossil fuels through technical assistance, capacity-building, and international cooperation.

About UAE Just Transition Work Programme (JTWP)

Figure 2. Source: DTE

- The JTWP is formally adopted at COP30 in Belem, Brazil, also called the Belém Action Mechanism (BAM).
- Aim: To support countries in transitioning away from fossil fuels through technical assistance, capacity-building, and international cooperation.
- It is particularly important for developing countries, which face the greatest social and economic disruption from fossil-fuel phase-out.
- Objective: It ensures that climate action supports communities, workers, and economies during the shift toward low-carbon and climate-resilient development.
- Purpose:
    - Inclusive Transition: It aims to help countries design transition pathways that are socially inclusive, economically sustainable, and environmentally sound.
    - Equity Focus: It emphasizes that climate transitions should generate new opportunities while protecting vulnerable groups and workers.
- Key focus areas:
    - Multi-Dimensional Approach: The programme integrates energy, socio-economic, workforce, and community dimensions into transition planning.
    - Social Protection: It requires transition strategies to include social protection measures for affected workers and communities.
    - Country-Specific Pathways: It encourages nations to tailor their transition plans to their own contexts and development priorities.

Mount Semeru

News: The Semeru volcano erupted recently, sending a massive 6,500-foot ash plume into the atmosphere.

About Mount Semeru

Source: thejakartapost

- Mount Semeru is the highest mountain on Java Island, Indonesia.
- It is an active volcano classified as a stratovolcano and is known for its frequent volcanic activity.
- The volcano is situated within the Bromo-Tengger-Semeru National Park in Lumajang Regency, East Java Province.
- Mount Semeru stands as the highest peak on Java, reaching an elevation of 3,676 meters (12,060 feet) above sea level.
- The volcano is part of the Pacific Ring of Fire, a region characterized by intense seismic and volcanic activity.
- It is also the part of the Island arcs formed by the subduction of the Indo-Australian plate below Sunda Plate (part of Eurasian Plate).

African Grey Parrot

News: African grey parrots continue to be widely sold in pet markets across country despite the fact that no registered breeders or authorized pet shops exist for this species.

About African Grey Parrot

Source: Seneca Park Zoo

- The African grey parrot is a medium-sized parrot with mottled grey plumage.
- Scientific name: Psittacus erithacus.
- This species is classified under the class Aves and the order Psittaciformes.

- It is among the world's most skilled birds when it comes to speaking and mimicking sounds.
- Habitat: They are also found at forest edges, in clearings, gallery forests, mangroves, wooded savannahs, cultivated land, and even gardens.
- Range: They are native to central and West Africa.
    - They are found from southeastern Ivory Coast across the moist lowland forests of West Africa to Cameroon.
    - Their range extends into the Congo forests and areas just east of the Albertine Rift in Uganda, Kenya, and Tanzania.
- Physical Features:
    - It has a large black bill, a white facial mask surrounding yellow eyes, and a distinctive red vent and tail.
    - Females feature a light gray crown bordered with darker gray, a gray body, and bright scarlet tail feathers.
    - Males appear much like females but their plumage darkens as they grow older.
    - It forms monogamous pairs and nests alone in tree cavities.
    - One of its defense mechanisms is fluffing up its feathers to appear larger and using its strong beak to bite.
- Diet: Its diet consists mainly of fruits, seeds, buds, nectar, and pollen.
- Life Span: African grey parrots can live for 50 years or more, often outliving their human caretakers.
- Conservation Status
    - IUCN Red List – Endangered
    - CITES – Appendix I

Bharat NCAP 2.0

News: The Ministry of Road Transport and Highways has issued a revised draft of Bharat NCAP 2.0 expanding assessment scope and updating safety standards.

About Bharat NCAP 2.0

Source – ET Auto

- The Bharat New Car Assessment Program (NCAP) 2.0 is a revised vehicle safety rating programme that evaluates the crashworthiness and safety technologies of cars sold in India.
- Nodal Ministry: Ministry of Road Transport and Highways (MoRTH)

- Certification by: Testing and certification are handled by the Central Institute of Road Transport (CIRT), Pune.
- Aim: Its aim is to upgrade India's vehicle safety standards, protect both occupants and vulnerable road users, and encourage adoption of advanced safety technologies.
- Key Features
    - Comprehensive Assessment Verticals: Bharat NCAP 2.0 evaluates every vehicle across five assessment areas which are –
        - Safe Driving
        - Accident Avoidance
        - Crash Protection
        - Vulnerable Road User Protection
        - Post-Crash Safety
    - Expanded Mandatory Crash Tests: Under the crash protection vertical, it introduces an expanded set of mandatory crash tests, including new full-width frontal impact and rear impact tests in addition to earlier tests.
    - Injury Assessment Using ATDs: The programme uses Anthropomorphic Test Devices (ATDs) to assess potential injuries to adult and child occupants in different crash scenarios during all required tests.
    - Focus on Active Safety Technologies: It makes the Electronic Stability Control (ESC) system a mandatory technology for eligibility to the star rating programme, while allowing manufacturers to voluntarily offer Autonomous Emergency Braking System (AEBS) for additional assessment.
    - Revised and Stricter Star Rating Criteria: The revised document increases the point thresholds for higher star ratings and introduces conditions such as minimum Adult Occupant Protection scores and the bar on zero scores in any assessment vertical for a five-star rating

About Bharat NCAP 2023

- Implementation: Bharat NCAP 2023 was implemented in October 2023.
- Purpose: Its purpose is to provide safety ratings for vehicles based on crash testing under Automotive Industry Standard AIS-197 and to give star ratings that reflect the crashworthiness of cars.
- Assessment verticals and crash test procedure: Under Bharat NCAP 2023, vehicles are assessed under Adult Occupant Protection, Child Occupant Protection and Safety Assist Technologies through controlled frontal, side and oblique side impact crash tests at specified speeds to evaluate safety performance.
- Nature of the Programme: Bharat NCAP 2023 is voluntary in nature.
- Valid till: It is an India-specific safety certification programme valid till September 30, 2027.

Moss

News: A study found that moss spores survived nine months in low-orbit space outside the International Space Station (ISS), with over 80% able to reproduce back on Earth.

About Moss

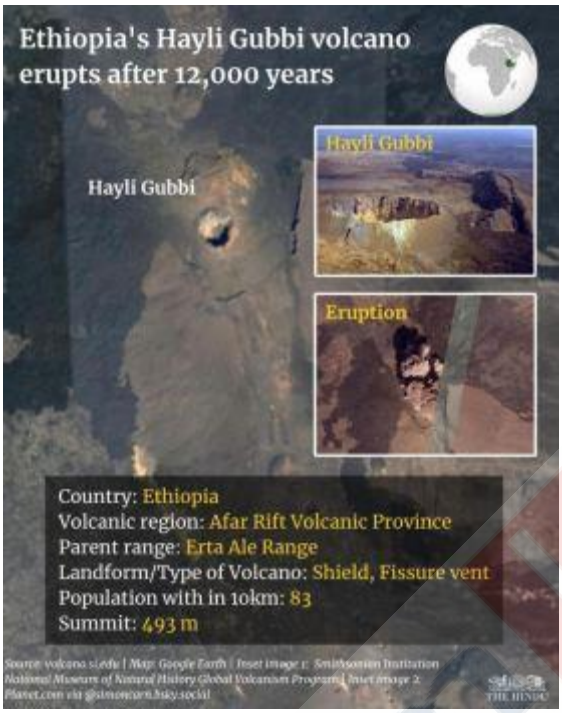
Source – Wikipedia

- Moss is a small non vascular plant known for its high resilience on earth.
- It belong to taxonomic division Bryophyta (bryophytes).
- Pioneering species: It is among the earliest land plants and has colonised some of the harshest environments on the planet, including Antarctica, volcanic fields, and deserts.
    - One of the most well-known cave mosses is *Schistostega pennata*, also known as dragon's gold, which shines an emerald green colour.
- Distribution: Mosses are distributed throughout the world except in salt water and are commonly found in moist shady locations.
- Environmental significance of Moss
    - Mosses function like natural sponges, absorbing rainfall and maintaining soil moisture.
    - They stabilise disturbed soil surfaces.
    - By regulating ground temperature, they protect roots in hot areas and slow ice thawing in cold regions.
    - Mosses enable formation of new ecosystems, especially in harsh environments.
    - Their microhabitats support biodiversity, providing shelter and protection to various small organisms.
    - Mosses are widely used as bioindicators of air pollution, especially for heavy metals, nitrogen compounds and acidic deposition.

Hayli Gubbi Volcano

News: Ethiopia's Hayli Gubbi volcano has erupted after 12,000 years and its ash cloud is moving towards western and northern India.

About Hayli Gubbi Volcano



Source – TH

- Location: It is located in the Rift Valley in Afar region of Ethiopia.
    - It forms part of the Erta Ale volcanic range.
    - It lies at the edge of the East African Rift, where the African and Arabian plates are slowly pulling apart (divergent boundary) in an intense geological activity zone.
- Type: It is a broad shield volcano formed by thin, fluid lava flows that usually erupt less explosively.
- Composition: It is built mainly from dark basaltic lavas but also contains more silica-rich rocks such as trachytes and rhyolites.
- Recent eruption: This volcano has erupted after almost 12,000 years.
    - The eruption was classified as sub-plinian, producing an ash cloud that rose up to 45,000 feet (14 km), dispersing volcanic ash, sulfur dioxide, glass shards, and fine rock fragments.

Auramine O

News: Recently, auramine O, a banned synthetic dye, has re-emerged in India's food chain, highlighting recurring chemical adulteration concerns.

About Auramine O

Source – TH

- Auramine O is a synthetic yellow industrial dye, produced from compounds such as dimethylaniline and formaldehyde.
- Regulation: It is not approved for use as a food colour in India, the European Union, the United States, or most other regulatory jurisdictions.
    - The International Agency for Research on Cancer (IARC) classifies it as a substance that is possibly carcinogenic to humans.
    - Concern: It is used to give a yellow colour to sweets, turmeric powder, chickpeas and street food snacks, despite the ban.
- Chemical property and structure
    - Formula: It has the molecular formula $C_{17}H_{22}ClN_3$.
    - Appearance: It typically appears as yellow flakes, powder or needle like crystals.
    - Solubility: It is soluble in ethanol and slightly soluble in water.
- Applications
    - Biological and medical uses
        - Fluorescent stain: Used to stain acid-fast bacteria in microscopy, particularly for detecting *Mycobacterium tuberculosis* and other mycobacteria.
        - Diagnostic tool: Helps in the direct detection of bacteria in patient specimens and is used to stain parasites like *Cryptosporidium* in stool samples.
        - Research: Investigated for potential uses in cancer treatments, cardiovascular disease research, and as a component in targeted drug delivery systems.
    - Industrial applications
        - Textile and leather industry: Used for dyeing acrylic, silk, and cotton fibers, as well as leather and paper.
        - Printing and inks: Used in direct printing, blotch discharge printing, and as a component in inks.
    - Other applications
        - Color lakes and paints: Used to create color lakes and is also used in the production of paints.
        - Food adulteration testing: Its presence is sometimes a marker for adulteration in certain food products, and specialized methods are used for its detection.
        - Health Concern: Ingestion of auramine O can cause liver and kidney damage, enlargement of the spleen, mutagenic effects, and carcinogenic outcomes with long-term exposure.

Blind Women's T20 World Cup 2025

News: Indian Women's blind cricket team have created history winning the first-ever Women's T20 World Cup for the Blind in Colombo.

About Blind Women's T20 World Cup 2025

Source – CABI

- The T20 Cricket for the Blind Women's World Cup is a pioneering initiative that champions inclusivity, empowerment, and sporting excellence.
- 2025 edition: The Blind Women's T20 World Cup 2025 was the inaugural tournament.
- Host: India and Sri Lanka co-hosted the event, with fixtures in Delhi, Bengaluru and Colombo.
- Teams participated: This historic tournament featured six teams: India, Pakistan, Sri Lanka, Australia, USA, and Nepal.
    - Eleven players make up a blind cricket team.
- Features: The game is played with a white plastic ball packed with ball bearings that rattle as it rolls, which allows it to be heard by players.
- Final Result: India emerged as the champion by defeating Nepal by 7 wickets in the final held at the P Sara Oval, Colombo.
- Rules followed: The event followed the International Blind Sports Federation Sight Classification rules, ensuring fairness and competitiveness.
- Role of CABI: The Cricket Association for the Blind in India (CABI) played a significant role in organizing and promoting the tournament, underscoring India's leadership in developing blind cricket globally.

About Cricket Association for the Blind in India (CABI)

- The Cricket Association for the Blind in India (CABI) is the apex body that organizes and conducts cricket for the blind across India.
- Affiliated to: It is affiliated to World Blind Cricket (WBC).
- CABI is the cricketing arm of Samarthanam Trust for the Disabled which governs cricket for the blind in India.

Article 240

News– The Centre is considering a proposal under the Constitution (131st Amendment) Bill, 2025 to bring Chandigarh under Article 240 of the Constitution.

Currently, Chandigarh is a Union Territory without a legislature, administered by the Governor of Punjab, who holds additional charge. The city also functions as the shared capital of Punjab and Haryana, and several laws of both states apply to it.

About Article 240

- Article 240 gives the President of India the power to make regulations for the peace, progress and good government of certain Union Territories, such as:
    - Andaman and Nicobar Islands
    - Lakshadweep
    - Dadra and Nagar Haveli and Daman and Diu
- These regulations can amend or repeal any existing law, including laws made by Parliament, applicable to those Union Territories.

Implications of Bringing Chandigarh Under Article 240

- If Chandigarh is brought under Article 240, the Centre (through the President) would be able to make laws for Chandigarh directly, instead of depending on Parliament for every legal change.

Abujhmadiya Tribe

News: The Abujhmadiya tribe is in news because its members are increasingly participating in the Bastar Olympics sports tournament.

About Abujhmadiya Tribe

Source – MoTA

- It is sub-group and sub-caste of the Gond tribe of the Central India region.
    - On racial grounds, they are placed in the Pre-Dravidian or Proto-Australoid group, with generally medium height and strong physique.
- Location: They inhabit the dense forests and hilly terrains of the Abujhmarh region, which spans the Narayanpur, Bijapur, and Dantewada districts of Chhattisgarh, bordering Maharashtra and Odisha.
- It is also recognized as one of the seven Particularly Vulnerable Tribal Groups (PVTGs) in Chhattisgarh.

- Language: Speak 'Madi', a local dialect of the Dravidian language family's Gondi dialect.
- Chief Deities: Major deities include Budhadeva, Thakur Dev (Tallubhet), Budhimai or Budhi Dokri, and Lingopen.
- They also have a house god (Chota pen, Bada pen, Manjhla pen) and a clan god (Gotranusara as the Kul Devta).
- Nature Worship: The tribe worships natural elements such as the Sun, Moon, rivers, mountains, and the Earth.
- Festivals : Major festivals include Pola, Kakasar, and Pandum, often linked to agricultural cycles.
- Dance and Music: Men and women are very fond of dancing and singing. Key dances include Kaksar, Gedi dance, and Rilo.
    - Traditional musical instruments like drums and flutes are used during performances.
- Folk Songs: Their folk songs include Dadriya, Relogeet, Poojageet, songs for marriage, engagement, and baby showers (chhatthi).
- Body Art: Tattooing (*Godana*) is considered a permanent jewel for Abujhmaria women.
- Social Structure:
    - The society is patriarchal and organized into clans (*gotras*).
    - They have a traditional caste panchayat system led by a *Manjhi* (chief).

Lachit Borphukan

News: Every year, 24th November is celebrated as Lachit Diwas to mark the birth anniversary of Ahom general Lachit Borphukan.

About Lachit Borphukan

- Lachit Borphukan was an Ahom army commander known for leading the 1671 Battle of Saraighat against the Mughals.
- Birth: He was born on 24th November 1622.
- Battle of Saraighat: In the 1671 Battle of Saraighat, fought on the Brahmaputra River, he lured the Mughals into a naval battle and defeated their fleet.
- Guerrilla tactics: He preferred guerrilla tactics, using mobile forces to raid large Mughal camps and positions.
- Death: He died on 25th April 1672, a year after the Battle of Saraighat.
- He was the inspiration behind strengthening India's naval force and revitalising inland water transport and creating infrastructure associated with it due to his great naval strategies.
- Recognition: The Lachit Borphukan gold medal, instituted in 1999, is awarded to the best National Defence Academy cadet.

About Ahom Dynasty

- Established: The Ahom kingdom was founded in 1228 in the Brahmaputra valley of Assam.
- Founder: The kingdom was founded by Chaolung Sukapha.
- First permanent capital: Charaideo was the first permanent capital of the Ahom empire, which was founded by the Ahom monarch Chao Lung Siu-Ka-Pha.
- The Ahoms fought several Mughal campaigns between 1615 and 1682 while retaining independence.
- Ahom rule ended in 1826 when the Treaty of Yandaboo annexed the province to British India.

SIDDHI 2.0 Platform

News: SIDDHI 2.0 is in the news because CCRAS has launched its second edition as a two-day national conclave in Vijayawada.

About SIDDHI 2.0 Platform

Source – PIB

- Full form: Scientific Innovation in Drug Development, Healthcare & Integration (SIDDHI 2.0)
- It is the second edition of CCRAS's flagship industry–research interface initiative in Ayurveda.
- Launched by: It has been launched by the Central Council for Research in Ayurvedic Sciences (CCRAS), Ministry of Ayush.
- Aim: It aims to act as a national translational accelerator that promotes wider industry adoption of CCRAS technologies and supports the development of evidence-based, globally competitive Ayurvedic pharmaceuticals.
- SIDDHI 2.0 marks a decisive shift towards research-led product development, indigenous technologies, and faster translational pipelines, which are key priorities of India's current Ayush innovation strategy.
- Significance: It lays the foundation for a modern, evidence-driven, and scalable future for Ayurveda in alignment with India's national vision for holistic health.

About Central Council for Research in Ayurvedic Sciences (CCRAS)

- It is an autonomous apex research body responsible for promoting scientific research in Ayurvedic Sciences.
- Nodal ministry: It is under Ministry of AYUSH.
- Establishment: It began in 1962 as the advisory Central Council for Ayurvedic Research.
- Purpose: To formulate, coordinate, and promote research in Ayurveda on scientific lines.
- Structure: It works through 30 institutes and collaborations with universities and hospitals.
- Objectives:
    - It frames research aims and undertakes programmes in Ayurveda.
    - It promotes institutions by financing enquiries and publishing literature.
    - It undertakes consultancy, sponsored R&D and national and international collaborations.

Lake Urmia

News: Iran has used cloud-seeding over the Urmia Lake basin to address the country's severe drought.

About Lake Urmia

Source: Britannica

- Location: It is a large oligotrophic and extremely hypersaline lake located in Iran.
    - It lies in the Armenian Highlands, between the provinces of Azerbaijan in Iran and west of the southern portion of the Caspian Sea
- It is the largest lake in the Middle East and the sixth-largest saltwater lake on Earth.
- The lake is surrounded by mountains in the west and north, and plateaus in the south and east.
- Feeding rivers: The inflow of water in the lake is from rivers like the Talkheh, Zarīneh, and Sīmīneh.
- Area: The lake covers an area ranging from 2,000 to 2,300 square miles.
- Elevation: It lies at an elevation of 4,183 feet (1,275 meters) above sea level.
- Protection status: The Lake, along with its 102 islands were protected to create Urmia Lake National Park in 1975.
- Features
    - Lake Urmia is known for its extremely salty water, which is one-fourth as salty as the Dead Sea.
        - Main salts in the lake are chlorine, sodium, and sulfates.
    - A unique feature of Lake Urmia is its changing colors in certain seasons.
        - The high salinity and microscopic activities cause the water to turn red and orange, creating a striking landscape.
    - The lake also has impressive salt dunes, adding to its natural beauty.
- Threats: Fluctuating water levels and reduced inflow due to climate change, water diversion, and human activity have raised concerns about the lake's future sustainability.

Critical Mineral Recycling Incentive Scheme

News: Recently, the progress of the ₹1,500 crore Incentive Scheme for Critical Mineral Recycling was reviewed.

About Critical Mineral Recycling Incentive Scheme

Source: PIB

- The Critical Mineral Recycling Incentive Scheme is a ₹1,500 crore initiative under the National Critical Mineral Mission.
- Aim: To boost India's recycling capacity for extracting critical minerals from secondary sources.
- Objective: The scheme seeks to develop an annual recycling capacity of 3 lakh tonnes for critical mineral extraction.
- Project Management Agency: Jawaharlal Nehru Aluminium Research, Development & Design Centre (JNARDDC), Nagpur.
    - It manages the application process, supports stakeholders, and oversees implementation.
- Focus: It focuses on securing vital materials needed for clean energy technologies, electronics, EVs, and strategic sectors.
    - It also focusses on rapidly scaling up domestic recycling capacity to meet the growing industry demand for critical minerals essential for clean energy, electronics, mobility, and strategic sectors.
- Features of scheme
    - Targeted Secondary Sources: The scheme promotes extraction of minerals from: E-waste, Spent Lithium-ion Batteries (LiBs) and Industrial scrap and other secondary materials
    - Beneficiaries: The scheme include both large recyclers and small/new recyclers, including start-ups.
        - One-third of the scheme outlay is earmarked specifically for small and new recyclers.
        - The scheme supports investments in new units, capacity expansion, modernization, and diversification of existing facilities.
    - Incentives apply to the actual extraction of critical minerals, not just mass production.
- Significance: The scheme strengthens India's circular economy and reduces dependence on imported critical minerals. It supports sustainable resource management and accelerates India's clean-energy transition.

Rare Earth Magnets

News: The Union Cabinet has approved 'Scheme to Promote Manufacturing of integrated Rare Earth Permanent Magnets' to promote manufacturing of sintered Rare Earth Permanent Magnets.

About Rare Earth Magnet

- Rare earth magnets are permanent magnets made from alloys of rare earth elements.
- They are the strongest type of permanent magnets.
- They are made using rare earth elements such as neodymium, samarium and dysprosium.
- The manufacturing process of REPMs involves converting rare earth oxides into metals, then turning those metals into alloys, and finally forming them into finished magnets with precise shapes and properties.
- Properties: REPMs have very high magnetic strength despite being small and lightweight.
    - These magnets retain their magnetic power for a long time and perform well even under extreme conditions.
    - REPMs are important because they produce powerful magnetic fields even when they are small and lightweight, making them ideal for advanced industrial and technological applications.
    - Their strength and efficiency allow machines and devices to perform better, use less energy, and become more compact.

Types of Rare Earth Magnets: There are two main types of rare earth magnets, each with distinct properties and uses:

- Neodymium Magnets (NdFeB): They are made from neodymium, iron and boron. They are the strongest and most widely used rare earth magnets.
- Samarium Cobalt Magnets (SmCo): They are made from an alloy of samarium and cobalt. They are known for excellent high-temperature performance and strong resistance to corrosion and demagnetization.

Uses: REPMs are essential in several key sectors, including:

- Electric vehicles (EVs): Used in motors for higher efficiency
- Renewable energy: Used in wind turbine generators
- Electronics: Found in smartphones, laptops, speakers and hard drives
- Aerospace and defence: Used in precision instruments and high-tech equipment

- Medical devices: Found in equipment like MRI machines and surgical tools.

Due to their importance in modern industries, REPMs are considered critical for national security and technological growth.

Ningaloo Reef

News: An unprecedented marine heatwave has caused catastrophic damage to the UNESCO-listed Ningaloo Reef in Western Australia, killing nearly 70% of its corals.

About Ningaloo Reef

Source: youraussieholiday.com.au

Location: Ningaloo Reef is located on Western Australia's remote northwest coast along the East Indian Ocean. It is about 1,200 km north of Perth.

- The reef is bordered by the striking red limestone ranges of Cape Range National Park.
- The reef forms part of the Ningaloo Coast World Heritage Area, which includes the reef and the adjoining Cape Range Peninsula.

Marine Biodiversity: Ningaloo sustains both temperate and tropical marine life, including mammals, reptiles, and diverse fish species.

- Coral Diversity: The reef contains around 250 coral species, including 200 hard corals, forming vibrant coral gardens.
- Fish Diversity: Over 500 species of fish inhabit the reef, contributing to its rich marine ecosystem.
- Mega Marine Species: The reef is home to manta rays, whale sharks, humpback whales, potato cod, dugongs, reef sharks and six species of sea turtles.
    - Ningaloo hosts one of the world's largest seasonal aggregations of whale sharks, making it one of the best places on earth to swim with them.

Aboriginal Heritage: The Yinikutira (Jinigudira) are the traditional owners of the Ningaloo Coast and the Cape Range region.

Recreational Activities: Ningaloo Reef is a popular destination for snorkelling, scuba diving, kayaking and marine wildlife tours.

Sirpur Archaeological Site

News: Chhattisgarh government is giving the Sirpur archaeological site a major upgrade, including battery-operated golf carts, digital exhibits, and immersive storytelling modules, as part of its efforts to prepare Sirpur for a UNESCO World Heritage Site nomination.

About Sirpur Archaeological Site

Source: IE

- Location: Sirpur is located in the Mahasamund district of Chhattisgarh.
- The site dates back to the 5th–12th centuries CE and contains monuments from multiple religious traditions.
- Sirpur stands on the banks of the Mahanadi River. Historically, it was known as Shripur or Sripura during its flourishing phase.
- History: Sirpur served as the capital of Dakshina Kosala under the Panduvanshi and later the Somavamshi kings.
- Discovery: The archaeological site was first discovered in 1882 by Alexander Cunningham. Major excavations were conducted in the 1950s, 1990s and again in 2003.

Archaeological Discoveries in Sirpur

Temples and Monasteries: Archaeologists uncovered 22 Shiva temples across the site. Excavations also revealed five temples dedicated to Vishnu.

- The Laxman Temple, dedicated to Lord Vishnu, is a notable example of Nagara-style architecture.
- The Gandheshwar Temple is renowned for its detailed carvings that highlight the artistic excellence of the period.
- The Surang Tila complex features a raised terrace accessed by 37 steps and built in panchayatana style.

Budhist Centres: Ten Buddhist viharas have been found along with large monasteries like the Tivaradeva Mahavihara which was a major Buddhist centre.

Jain Centres: Three Jain viharas form part of the multi-religious blend of the site.

Sculptures and Artifacts: Exquisite sculptures of deities and fragments of ancient pottery demonstrate the skilled craftsmanship of the region's artisans.

Sirpur's Trade and Commerce

Sirpur's position along the Mahanadi River made it a strategically important trade centre. The region prospered as a hub for trading goods such as gemstones, textiles, and spices.Remains of old marketplaces highlight the city's significance in regional and long-distance trade.

Tex-RAMPS Scheme

News: The Government of India has approved the Tex-RAMPS scheme to boost innovation and competitiveness in the textiles sector.

About Tex-RAMPS Scheme

Source – Ministry of Textiles

- Textiles Focused Research, Assessment, Monitoring, Planning and Start-up (Tex-RAMPS) Scheme is for future-proofing India's textiles and apparel ecosystem.
- Type of Scheme: It is a Central Sector Scheme.
- Ministry involved: It is fully funded and implemented by the Ministry of Textiles.
- Timeline: The scheme is co-terminus with the upcoming Finance Commission cycle.
- Aim: It addresses critical gaps in research, data systems, innovation support and capacity development.
- Vision: Its vision is to position India as a global leader in sustainability, technology and competitiveness.
- Financial layout: The scheme has an outlay of ₹305 crore for for 2025–31.
- Key component: The key components are research and innovation, data, analytics and diagnostics, the Integrated Textiles Statistical System, capacity development and knowledge ecosystem, and start-up and innovation support.
- Key features:
    - Integrated Textiles Statistical System (ITSS): It a real-time analytics platform intended to improve structured monitoring and strategic decision-making across the sector.
    - It will foster entrepreneurship by supporting incubators, hackathons and collaborations between academia and industry to promote high-value textile start-ups.

Finn's Weaver

News: Finn's Weaver Bird is in the news because its population is rapidly declining in the Terai region.

About Finn's Weaver

Source – DTE

- The Finn's Baya (*Ploceus megarhynchus*) is also called as Finn's Weaver, Yellow Weaver and Himalayan Weaver.
    - In Uttarakhand, it is called *Pahari* (hill) Baya.
- Naming: The weaver bird was named Finn's Weaver after Frank Finn, the British officer who identified the bright yellow colour during the breeding season.
- First identified by: It was first identified by A O Hume (father of Indian ornithology).
- Habitat: It lives near dams and reservoirs where marshy soil, water and tall grasses provide nesting sites.
- Distribution: It is native to the Ganges and Brahmaputra valleys in India and Nepal, especially the Terai grasslands.
- Diet:
    - Finn's Weavers are primarilyGranivorous.
    - It is also an opportunistically (during the breeding period) insectivorous.
- Conservation status
    - IUCN Red list: It is in Endangered category.
    - Wildlife Protection Act, 1972: It is placed in Schedule IV of the Wildlife Protection Act, 1972.
- Threats: Expansion of agriculture, grass cutting, construction and water management decisions, along with floods, crow attacks and breeding failures, threaten this species.

Scheme to Promote Manufacturing of Sintered Rare Earth Permanent Magnets (REPM)

News: The Union Cabinet approved the Scheme to Promote Manufacturing of Sintered Rare Earth Permanent Magnets with a financial outlay of Rs. 7,280 crore.

About Scheme to Promote Manufacturing of Sintered Rare Earth Permanent Magnets (REPM)

Source – PIB

- It is a first-of-its-kind national initiative to build a complete domestic supply chain from rare earth oxides to finished high-performance Rare Earth Permanent Magnets (REPMs).
    - It will support setting up integrated REPM manufacturing units that convert rare earth oxides into metals, then metals into alloys, and finally alloys into finished magnets.
- Nodal ministry: The nodal ministry is the Ministry of Mines (with oversight from the Department of Atomic Energy and NITI Aayog).
- Targets
    - Establish 6,000 Metric Tons per Annum (MTPA) integrated REPM manufacturing capacity.
    - Select 5 beneficiaries through global competitive bidding, each with up to 1,200 MTPA capacity.
- Financial outlay
    - Total outlay: Rs. 7,280 crore
        - Rs. 6,450 crore as sales-linked incentives for five years.
        - Rs. 750 crore as capital subsidy for setting up 6,000 MTPA capacity.
- Duration: The total duration of the scheme will be 7 years from the date of award which include-
    - a 2-year gestation period for setting up an integrated REPM manufacturing facility
    - 5 years for incentive disbursement on the sale of REPM.

Current Status of India w.r.t. Rare Earth Permanent Magnets (REPMs)

- Rare earth reserves in India: India has 6.9 million tonnes of rare earth reserves, (5th largest globally), yet contributes around 1% to global production.
    - Distribution:
        - It spread across coastal placer sands in Odisha, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra and Gujarat.
        - It is also found in hard-rock deposits in Rajasthan and Gujarat.

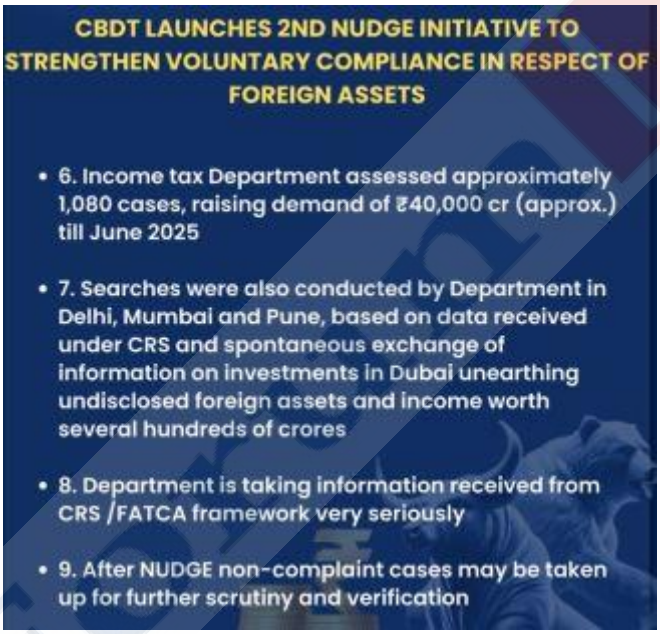
- REPMs consumption in India: India currently consumes about 4,000–5,000 tons per annum (TPA) of permanent magnets.
    - Future demand: REPM demand is expected to double by 2030 from 2025 due to electric vehicles, renewable energy, and electronics.
    - Import dependent: Presently, REPM demand is almost fully import-dependent.

NOTE: For more information on Rare Earth Permanent Magnets (REPMs), please click here.

NUDGE Initiative

News: The Central Board of Direct Taxes (CBDT) is launching the second NUDGE Initiative based on its analysis of Automatic Exchange of Information (AEOI) data for FY 2024–25.

About NUDGE Initiative



Source – ET

- Full form: "Non-intrusive Usage of Data to Guide and Enable (NUDGE)" initiative
- Implementing agency: Central Board of Direct Taxes (CBDT)
- Nodal Ministry: Ministry of Finance
- Aim: To strengthen voluntary tax compliance through data-driven, non-intrusive communication.
- Focus: It focuses on helping taxpayers correctly disclose foreign assets and foreign-source income.
- First NUDGE Campaign: The first NUDGE Campaign was launched in November 2024.
    - It targeted taxpayers flagged under Automatic Exchange of Information (AEOI) for not reporting foreign assets in AY 2024–25.
    - It resulted in: 24,678 taxpayers revising returns, disclosure of ₹29,208 crore worth foreign assets and declaration of ₹1,089.88 crore foreign-source income.
- Second NUDGE Campaign: The second NUDGE Campaign was launched in November 2025.
    - Under the campaign, SMSs and emails will be issued to such taxpayers whose foreign assets appear to exist but have not been reported in the ITRs filed for AY 2025-26.

- This is to advise them to review and revise their returns on or before 31st December 2025 to avoid penal consequences.
- The campaign aims to facilitate correct reporting in Schedule Foreign Assets (FA) and Foreign Source Income (FSI) in ITRs.

- Note: Accurate and complete disclosure of foreign assets and income is a statutory requirement under the Income-tax Act, 1961 and the Black Money (Undisclosed Foreign Income and Assets) and Imposition of Tax Act, 2015.

About Automatic Exchange of Information (AEOI)

- It is a system for the regular exchange of financial account information between tax authorities of different countries under international agreements developed by the Organisation for Economic Co-operation and Development (OECD).
- Objective: To promote global tax transparency and curb tax evasion by enabling jurisdictions to access information about their residents' foreign financial assets.
- The framework operates through major international standards such as
  - Common Reporting Standard (CRS)
  - Foreign Account Tax Compliance Act (FATCA)
- These frameworks require financial institutions to identify and report accounts held by specified individuals and entities to their respective tax authorities.
- AEOI significantly aids tax administrations in detecting undisclosed offshore assets, recovering tax revenue, and encouraging voluntary compliance.

Bnei Menashe

News: Israel has approved a plan to bring the remaining 5,800 Bnei Menashe Jews from Northeast India to the country within the next five years.

About Bnei Menashe

Source: The Week

- The Menashe or Bnei Menashe are an indigenous community from Manipur and Mizoram in Northeast India.
- They belong mainly to the Chin, Kuki, Mizo, and Zo ethnic groups.

- The community believes it descends from the biblical Tribe of Menashe, one of the Ten Lost Tribes of Israel exiled by the Assyrian Empire roughly 2,700 years ago.
    - According to historians, the community is believed to have reached India approximately three to five centuries ago.
    - Their claim has cultural and traditional roots, though it is not scientifically proven.
- They are Christians who have converted to Judaism and now follow traditional Jewish practices, including observing holidays like Sukkot.
    - Over the last several decades, many Bnei Menashe have embraced Jewish rituals.
- In 2005, they were recognized as "Zera Yisrael" (descendants of Israel), a classification that allowed them to pursue immigration.
- In November 2025, Israel approved a plan to bring all remaining 5,800 Bnei Menashe from Northeast India over the next five years, completing their Aliyah by 2030.

Grey Seal (Halichoerus grypus)

News: A recent study found that grey seal milk contains 332 different kinds of oligosaccharides, making it more complex than human milk.

About Grey Seal (Halichoerus grypus)

Source – Wildlife Trust

- Grey seal is a marine mammal belonging to the family Phocidae.
- It is also called the Atlantic seal or the horsehead seal.
- Habitat: It spends most of their lives in coastal waters.
    - On land, it hauls out on rocky coasts, islands, sandbars, ice shelves, and icebergs.
- Distribution: It is found across shores of the North Atlantic Ocean, from the mid-Atlantic region to the Baltic Sea.
- Features
    - Males can grow up to 10 feet long, while females are smaller.
    - Males have large, horse-like heads.
    - Pups are born with white lanugo fur which helps retain warmth by absorbing sunlight and trapping heat.
    - Behaviour: It is diurnal, active during the day and sleeping at night.
        - It displays bottling behaviour, where the seal floats vertically with only its head above water.

- Diet: It is carnivores feeding mainly on benthic or demersal fish, squid, and occasionally seabirds.
- Indicators species: Being apex predators, it absorbs high levels of pollutants, serving as indicators of marine ecosystem health.
- Life Span: It typically lives between 25 and 35 years.

- Conservation Status: It is listed as Least Concern on the IUCN Red List.
- Threats: They face threats from receding ice cover, pollution, shrinking fish stocks, and disease.

About Grey Seal Milk

- Grey seal milk contains 332 types of oligosaccharides, the highest recorded in any mammal milk, surpassing human milk which averages 100.
  - Oligosaccharides are carbohydrates composed of a small number (typically 2 to 10) of monosaccharide sugar units.
    They are found in foods like fruits, vegetables, legumes, and milk.
  - They act as prebiotics, feeding beneficial gut bacteria and supporting gut health.
- These sugars help protect against viruses and bacteria, support gut development, and promote healthy microorganism growth in pups.
- Grey seal milk may help develop future medicines or may be added to breast milk substitutes to strengthen infant immunity.

Key Facts About Italy

News: The Italian Parliament has approved a law recognizing femicide, with support from both ruling and opposition parties, to better protect women.

Key Facts About Italy

Source – Britannica

- Location: Italy is located in Southern and Western Europe, consisting of a peninsula extending into the Mediterranean Sea and several islands.
- Capital: The capital and largest city of Italy is Rome.
- It is the tenth-largest country in Europe by area and the third-most populous EU member.

- Land boundaries
    - It shares land borders with France, Switzerland, Austria, Slovenia and enclaves Vatican City and San Marino.
    - Exclave: Campione d'Italia is an Italian exclave in Switzerland.
- Coastline Border: Italy has a coastline of 7,600 km on the Mediterranean Sea, the Ligurian and Tyrrhenian seas, the Ionian Sea, and the Adriatic Sea – including its islands.
- Climate: Coastal areas largely follow a Mediterranean climate, while inland northern and central regions experience humid subtropical conditions.
- Mountains
    - The Apennine Mountains run through the centre of the peninsula, while the Alps mountain form most of its northern boundary.
    - Highest point: Mont Blanc
- River
    - The Po River is the longest river of Italy which flows across the Padan plain.
    - Most of its rivers drain into the Adriatic or Tyrrhenian Sea.
- Lake: Lake Garda is the largest lake of Italy.
- Volcanic Features
    - Active volcanoes – Mount Etna (largest in Europe), Stromboli, and Vesuvius.
- Terra Rossa: Much of southern and coastal Italy has a soil known as Terra Rossa — a reddish, clayey to silty-clay soil formed over limestone or dolomite in Mediterranean climate zones.

International Maritime Organization (IMO)

News: India has been re-elected to the Council of the International Maritime Organization (IMO) in Category B, comprising 10 countries with the largest interest in international seaborne trade.

About International Maritime Organization

Source: IMO

- International Maritime Organization is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships.
- Purpose: To create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented.
- Established in: It was established in 1948 and the IMO Convention entered into force in 1958.

- Headquarters: London, UK
- Member states: IMO currently has 176 Member States and three Associate Members.
    - India joined the IMO in 1959.
    - There are 67 intergovernmental organizations which have observer status and 88 international non-governmental organizations in consultative status with IMO.
- Structure of the organisation:
    - IMO is led by the Secretary General.
    - IMO Assembly: It consists of all Member States and is the highest governing body of the Organization.
    - IMO Council: It is elected by the Assembly for a term of two years. It acts as the executive organ of IMO and is responsible for supervising the work of the Organization.

Vikram-I

News: Recently, the Prime Minister has unveiled India's first privately developed orbital launch vehicle Vikram-I.

About Vikram-I

Source: News11

- Vikram-I is India's first privately developed orbital-class rocket.
- Built by: Skyroot Aerospace in Hyderabad.
- Launched by: Skyroot Aerospace is targeting early 2026 for Vikram-I's maiden orbital flight.
- Named after: It is named after Dr. Vikram Sarabhai, the pioneer of India's space programme.
- Purpose: Vikram-I is designed to serve the small satellite launch market with rapid, affordable orbital access.
- The rocket is intended to support dedicated launches, rideshare missions, and multi-orbit deployments for small satellite operators.
- It aims to provide fast turnaround, enabling assembly and launch within 24 hours from any launch site.
- Features:
    - Dimensions: The rocket stands 20 meters tall and has a diameter of 1.7 meters, making it compact yet powerful.
    - It generates 1,200 kN of thrust using solid propulsion in its first three stages.

- It uses an all-carbon composite structure, which reduces weight while improving strength and efficiency.
- It incorporates 3D-printed engines that reduce engine mass by up to 50% and cut production time by 80%.
- It uses ultra-low-shock pneumatic separation systems, which ensure safer and smoother stage separation.
- Its advanced avionics system enables precise real-time guidance during ascent.
- The rocket includes a restartable orbital adjustment module, allowing insertion into multiple orbits in a single mission.
- Payload Capacity: Vikram-I can carry up to 350 kg to Low Earth Orbit (LEO).
    - It can deliver 260 kg to a Sun-Synchronous Orbit (SSO).
    - It is capable of lifting 290 kg to a 500 km SSO, and 480 kg to a 500 km LEO at a 45° inclination, depending on mission profile.

- Propulsion System:
    - Stage 1 – Kalam-1200: Kalam-1200 is a 10-meter solid rocket motor made from carbon fiber. It produces a peak thrust of 120 tons and burns for 80–100 seconds.
    - Stage 2 – Kalam-250: The second stage uses solid propulsion similar in design to the first stage.
        - It provides the mid-ascent boost after first-stage separation.
    - Stage 3 – Kalam-100: The third stage, known as Kalam-100, produces 100 kN of thrust in vacuum for 108 seconds.
    - Stage 4 – Raman Engine Cluster: The fourth stage uses a cluster of four Raman engines, each producing 3.4 kN of thrust.

International IDEA 2026

News: Chief Election Commissioner of India is set to assume the Chairship of the International Institute for Democracy and Electoral Assistance (International IDEA) for 2026.

About International IDEA

Source – International IDEA

- International IDEA (International Institute for Democracy and Electoral Assistance) is an intergovernmental organisation founded in 1995.
- It works to strengthen democratic institutions and electoral processes worldwide.
- The organisation promotes inclusive, resilient, and accountable democracies globally.
- Membership: It has 35 member countries, with the US and Japan as observers.
    - India is a founding member of International IDEA and has consistently contributed to its governance and democratic initiatives.
- Governance
    - The Institute's governance consists of a Council of Member States, a Steering Committee, a Finance and Audit Committee, a Board of Advisers and a Secretariat, led by the Secretary-General.
    - The Council of Member States are governments from all regions.
    - Chairship: Each year, the Council elects a Chair and two Vice Chairs among its Members States.
- Registered Electors (35 IIDEA Member Countries): 1,887,164,374

About International IDEA 2026

- Chief Election Commissioner (CEC) of India will assume the Chairship of International IDEA in 2026.
- As Chair, India will preside over all council meetings throughout 2026.
- Significance: The Chairmanship is seen as a major global recognition for the Election Commission of India (ECI).