June 2024 – Current Affairs RajasirIAS.com

INDEX

POLITY & GOVERNANCE

- The Delhi High Court ordered State authorities to take action against the use of oxytocin on cattle in dairy colonies in the Capital.
- The Supreme Court on Thursday reserved one-third of the seats in the executive committee of the Supreme Court Bar Association (SCBA) for women.
- Bombay High Court deems Look Out Circulars by public sector banks against default borrowers without statute unconstitutional.
- Recently, The Delhi High Court emphasized the need of teaching minors about the concept of "virtual touch" alongside traditional notions of "good touch" and "bad touch."
- The Supreme Court ruled that advocates cannot be held liable under the Consumer Protection Act of 1986 for deficiency in service.
- Draft Digital Competition Bill 2024
- The Ministry of Home Affairs warns of 'digital arrest' scam by cyber criminals impersonating police officials.
- Ministry Of Renewable Energy Issued A Warning To Farmers On PM-KUSUM Website Against Fake Websites And Mobile Applications.
- The Supreme Court recently observed that the extraordinary powers under Article 142 of the Constitution of India is an exception to the doctrine of merger and the rule of stare decisis to do complete justice between the parties.
- Recently, The Supreme Court Agreed with the Election Commission's view that Article 329(b) restricts judicial interference.

- **According to Reporters Without Borders (RSF for Reporters sans Frontières), India's position in the World Press Freedom Index declined from 36.62 to 31.28.**

DEFENCE & SPACE

- **Eye on modernising submarine fleet, Indian Navy floats Rs 60,000 Crore tenders.**
- **India's first indigenous bomber UAV aircraft, the FWD-200B, developed by Flying Wedge Defence, an Indian defence and aerospace company, was unveiled recently.**
- **The Army and the Indian Air Force will likely have their MQ-9B Predator Drones in Gorakhpur and Sarsawa.**
- **The Border Roads Organisation (BRO) is preparing to commence the construction of the Shinkun La Tunnel.**
- **ISRO successfully conducts a long duration test of the PS4 engine of the PSLV stage.**
- **New Space India Limited (NSIL) has called on private players to manufacture its largest launch vehicle LVM3 (Geosynchronous Satellite Launch Vehicle Mk III).**
- **SKAMPI, a prototype telescope of the Square Kilometre Array Observatory (SKAO), has achieved its first light.**
- **INS Kiltan, one of the P28 (Project 28) Anti-Submarine Warfare (ASW) Corvettes, recently visited Brunei and the Philippines.**
- **An Indian Air Force (IAF) contingent recently arrived at the Eielson Air Force Base in Alaska to participate in the prestigious multi-national exercise, Red Flag 24.**

- **Recently, the Defence Research & Development Organisation (DRDO) successfully flight-tested the RudraM-II air-to-surface missile from Su-30 MK-I platform of the Indian Air Force (IAF) off the Odisha coast.**
- **Recently, Srinivas R Kulkarni, an Indian-origin US scientist has been awarded the prestigious Shaw Prize in Astronomy for 2024.**

INTERNATIONAL RELATIONS

- **US accuses Russia of using 'chemical weapon CHLOROPICRIN" in Ukraine**
- **India Contributes $5,00,000 to UN Counter-Terrorism Trust Fund**
- **10-year contract signed for the development of Shahid Beheshti Port Terminal at Chabahar Port.**
- **The Philippines recently challenged China to open Scarborough Shoal to international scrutiny after it accused Beijing of destroying the shoal"s marine environment.**
- **The Arab League recently called for UN peacekeeping forces in the Palestinian territories during a summit in Bahrain"s Manama.**
- **The Fourth International Conference on Small Island Developing States (SIDS-4) will be convened (May 27-30) in Antigua and Barbuda, North America.**
- **Recently, North Korea fired a barrage of suspected ballistic missiles toward its Eastern sea.**
- **The world will celebrate Immanuel Kant (1724-1804) 300th birth anniversary this year.**

ECONOMICS

- **The Ministry of Home Affairs (MHA) has cancelled the registration of at least five Non-Governmental Organizations (NGOs) for allegedly violating provisions of the Foreign Contribution Regulation Act (FCRA).**
- **The National Bank for Agriculture and Rural Development (NABARD) has sanctioned a study on the impact evaluation of Geographical Indication (GI) products.**
- **The Reserve Bank of India (RBI) revised the guidelines for custodian banks to issue Irrevocable Payment Commitments (IPCs) in light of the T+1 settlement regime for stocks.**
- **Indian stock market has been witnessing volatility amid the ongoing Lok Sabha elections and swing trading has been trending on the internet.**
- **The government's Department of Pension & Pensioners" Welfare recently started the Integrated Pensioners' Portal in collaboration with Bank of India.**
- **NPCI issues guidelines for merchant acquisition on BHIM Aadhar Pay**
- **The Labour and Employment Ministry has boarded the PM Gati Shakti portal to identify and bridge gaps in social security coverage across the country.**
- **India VIX Index**
- **Airbus Helicopters and the Small Industries Development Bank of India (SIDBI) recently signed a Memorandum of Understanding (MoU) for financing the purchase of Airbus' helicopters in India.**
- **NFRA - National audit watchdog set to expand Inspection.**

June 2024 – Current Affairs RajasirIAS.com

- **Recently, Maldives is set to introduce India's RuPay service.**
- **The WIPO Treaty on Intellectual Property, Genetic Resources, and Traditional Knowledge was adopted at a World Intellectual Property Organization (WIPO) Diplomatic Conference at its headquarters in Geneva, Switzerland.**
- **Recently Meme Coins are Garnering considerable popularity within the cryptocurrency realm.**
- **As per official data, India has recorded a trade deficit with 9 of its top 10 trading partners in 2023-24.**
- **Recently, the Reserve Bank of India (RBI) has launched three major initiatives – PRAVAAH portal, the retail direct mobile app and a fintech repository.**
- **The International Labour Organization (ILO) has released the Asia-Pacific Employment and Social Outlook 2024, highlighting the region's recovery from the global pandemic and the challenges posed by a rapidly ageing population.**
- **Registrations by Indian companies for external commercial borrowings (ECBs) almost doubled to $49.2 billion in the financial year 2023-24 (FY24) from $26.6 billion in FY23, according to data from the RBI.**
- **The Reserve Bank of India (RBI) recently issued the Framework for Recognising Self-Regulatory Organisation for the FinTech Sector (SRO-FT) for better self-governance and compliance by firms in this space.**

ENVIRONMENT

- **Scientists recently observed a wild male orangutan repeatedly rubbing chewed-up leaves of a medicinal plant on a facial wound in a forest reserve in Indonesia.**
- **European Parliament and the European Council reached to provisional agreement to establish the first EU-level Carbon Removal Certification Framework.**
- **India hosts 46th Antarctic Treaty Consultative Meeting and 26th Meeting of the Committee for Environmental Protection.**
- **A new biocontrol agent to manage 'foot rot' disease in Basmati crop: Why this matters?**
- **Constructed wetlands emerge as a promising approach, offering not only effective treatment but also environmental and economic benefits.**
- **World's largest Direct Air Capture and Storage (DAC+S) plant in Iceland**
- **A leopard cat has been spotted in Maharashtra's Pench Tiger Reserve for the first time.**
- **The Injambakkam-Akkarai stretch development project has been recommended by the Tamil Nadu Coastal Zone Management Authority (TNSCZMA).**
- **Kadar tribesman's death in Tamil Nadu's Anamalai Tiger Reserve in an elephant attack has left the indigenous community in shock.**
- **Kanwar lake, Bihar's only Ramsar site, faces challenge of survival but not a poll issue.**
- **Recently, The 26th meeting of the Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA-26) of the Convention on Biological Diversity (CBD) was held at Nairobi, Kenya.**

- **Census exercise begins in Himachal's cold desert Lahaul & Spiti district to estimate blue sheep, Himalayan ibex.**
- **Recently, a new study has shed light on the extent of microplastic pollution in Ashtamudi Lake, underscoring the need for continuous monitoring and addressing "potential public health concerns."**
- **The National Green Tribunal (NGT) is addressing a case regarding high-tension electrical lines being laid through the eco-sensitive zone of Mrugavani National Park.**
- **Researchers from the University of Cambridge have developed a pioneering zero-emission cement production method.**
- **Kerala Revises KFDC Order to Combat Invasive Species and Human-Wildlife Conflict.**
- **Recently, A New algal species "Oedocladium sahyadricum" discovered in the natural forests of Kumbhavurutty region of Western Ghats in Kollam.**
- **Recently, a Himalayan serow was spotted in the central part of Nameri National Park and Tiger Reserve.**
- **The 3rd edition of the World Wildlife Crime Report (WWCR)-2024 was released by the United Nations Office on Drugs and Crime (UNODC).**

GEOGRAPHY

- **The Indian National Centre for Ocean Information Services (INCOIS) has issued a warning to the coastal states about the "complete suspension of operational and recreational activities.**

- The Cook Islands is at the vanguard of a quest to mine the ocean floor for minerals used in electric car batteries.
- Indian Ocean basin-wide (IOBW) index exhibits a close association with dengue outbreaks in both the Northern and Southern hemispheres.
- Less rainfall, high temperature: Tea production in Assam, Bengal may fall by 50%
- India's first research testbed to study Nor'westers getting ready
- Severe Cyclone Remal.

SCIENCE AND TECHNOLOGY

- 50th anniversary of the Expanded Programme on Immunization (EPI)
- Tokyo Atacama Observatory (TAO) Project
- KAVACH (train collision avoidance system)
- Newly Discovered Peptide Could Treat Incurable Bacterial Infections.
- Endosymbiotic Theory
- India"s first high-performance System-On-Chip (SoC), developed by an IIT-Madras incubated startup.
- Kerala"s health department recently reported West Nile fever cases in three districts.
- Nerium Oleander's Toxicity
- The strongest geomagnetic storm in over two decades recently hit Earth, causing radio blackouts and extending the northern lights to the southern United States.
- China has inaugurated the High Energy Photon Source (HEPS), which will be the first fourth-generation synchrotron light source in Asia.

- **Recently, the World Health Organization (WHO) released its updated Bacterial Priority Pathogens List (BPPL) 2024.**
- **Recently, the FSSAI has published a comprehensive guidance document titled "Artificial Ripening of Fruits- Ethylene gas a safe fruit ripener".**
- **A new study by researchers found that ferroptosis is the major cell death mechanism that underlies COVID-19 lung disease.**
- **IIT Madras-incubated ePlane Company is expected to launch electric Vertical Take-Off and Landing (eVTOL) aircraft in Bengaluru.**
- **A recent study challenges the perceived heart health benefits of fish oil supplements rich in omega-3 fatty acids, raising concerns about their impact on cardiovascular health.**
- **Recently, between January and March 2024, about 32,000 cases of Whooping Cough were reported across Europe.**
- **Earlier in May 2024, a team of researchers at Banaras Hindu University (BHU) had conducted a one-year follow-up study on Covaxin vaccine.**
- **Recently, the Central Council for Research in Ayurvedic Sciences (CCRAS) launched "PRAGATI- 2024" (Pharma Research in AyurGyan And Techno Innovation).**

SOCIETY

- **Alok Shukla, convenor of the Chhattisgarh Bachao Andolan and founding member of the Hasdeo Aranya Bachao Sangharsh Samiti, has been awarded the 2024 Goldman Prize from Asia.**
- **How the Widal test is clouding India's sense of its typhoid problem.**
- **Global Report on Internal Displacement.**

- **Muria tribes' own eco-friendly, foolproof seed preservation method**
- **THE 77TH WORLD HEALTH ASSEMBLY: A DECISIVE MOMENT FOR THE FUTURE OF GLOBAL HEALTH COOPERATION**
- **World No Tobacco Day 2024**

ART AND CULTURE

- **UNESCO's Register added three significant Indian literary works at the 10th meeting of the Memory of the World Committee for Asia and the Pacific (MOWCAP).**
- **PM Modi offers prayers at Jagannath temple in Puri**
- **A portion of the Virupaksha temple in Karnataka collapsed due to torrential rains recently.**
- **Nation celebrates Ahilyabai Holkar's 300th birth anniversary**
- **Birth anniversary of Kartar Singh Sarabha was recently celebrated.**

POLITY & GOVERNANCE

The Delhi High Court ordered State authorities to take action against the use of oxytocin on cattle in dairy colonies in the Capital.

- **Petition Against Dairies**: The court's order came after a petition appealed to authorities to look into the state of dairies in the Capital.

Delhi High Court Ruling

- **Administering of oxytocin** amounts to **animal cruelty** and is a **cognisable offense under Section 12 of The Prevention of Cruelty to Animals Act, 1960.**

Prevention of Cruelty to Animals Act, 1960(PCA):

- It is the primary legislation criminalizing various forms of cruelty towards animals and prevents the infliction of unnecessary pain or suffering on animals.
- **Weekly Inspections and Legal Action**: The court asked the Delhi government's Department of Drugs Control to conduct weekly inspections and register cases against the administration of the hormone.
- **Source Tracing**: It asked the Delhi police to identify the sources of oxytocin production, packaging and distribution, and take action in accordance with the law.

Oxytocin

- Also known as the **'love hormone'**, Oxytocin is secreted by the **pituitary glands** of mammals during sex, childbirth, lactation or social bonding. It could be chemically manufactured and sold by pharma companies for use during childbirth. It is administered either as an injection or a nasal solution.

- Role: Oxytocin plays a key role in both the female and male reproductive systems. This includes increasing contractions to induce labor and birth, and the release of milk from the breast after birth.
- It also acts as a chemical messenger in the brain and influences important elements of human behavior such as **social recognition, relationship formation and long-term emotional attachment.**
- **Significance**: Its use is crucial to prevent new mothers from excessively bleeding after giving birth—a common cause of maternal deaths.
- According to an India sample registration scheme survey conducted in 2001-2003, postpartum hemorrhage accounted for 38 percent of maternal deaths.

Concerns Associated:

- **Misuse of oxytocin**: It is being used **illegally to increase milk production** in dairy animals which are forced to produce milk through painful procedures and can become infertile with long-term use.
- **Health Impact**: Its overuse on milch cattle to improve production harms not only the cattle's health but also the health of humans consuming the milk.
- There are concerns that milk from oxytocin-treated animals may contain residues of the hormone that could potentially have negative health impacts on human consumers.

The Supreme Court on Thursday reserved one-third of the seats in the executive committee of the Supreme Court Bar Association (SCBA) for women.

Status of Women in Judiciary:

Supreme Courts:

- Only **11 women** have served as judges in the Supreme Court since independence, comprising merely **4.1% of the total 268 judges** appointed.

- The first woman judge, **Justice Fathima Beevi**, was appointed in **1989**.
- Currently, there are three female judges: **Justices Hima Kohli, Bela Trivedi, and BV Nagarathna.**
- Justice **BV Nagarathna** is **projected** to be the **first female Chief Justice of India in 2027**, albeit for a short tenure of 36 days.
- The appointment in 2021 of Justices Kohli, Nagarathna, and Trivedi marked a historical moment with four female judges simultaneously serving in the Supreme Court, the highest number to date.

High Courts:

- India has **25 High Courts** with a sanctioned strength of 1,114 judges, but only 782 are currently serving.
- Of the serving judges, only **107 are women**, which is about 13%.
- Justice Sunita Agarwal was recently appointed as the Chief Justice of Gujarat High Court, a notable appointment given the scarcity of female chief justices across other High Courts.
- Despite **no reservation** for specific groups, the Centre has advised High Court Chief Justices to consider candidates from diverse backgrounds, including women, to ensure social diversity in appointments.

Lower Judiciary:

- The lower judiciary shows a higher representation of women compared to the higher courts, with **35% of judges** being women according to the India Justice Report 2022.
- A study by the Vidhi Centre for Legal Policy in 2018 noted that while there is better representation at the lower judiciary level, it diminishes significantly in higher positions such as district judges.
- In states **like Goa, Meghalaya, and Sikkim**, women judges exceed **60%** of the judiciary, the highest in the country.

- Several states including Andhra Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Karnataka, Odisha, Rajasthan, Tamil Nadu, Telangana, and Uttarakhand have implemented quotas ranging from 30% to 35% for women in the lower judiciary through direct appointments.

Bombay High Court deems Look Out Circulars by public sector banks against default borrowers without statute unconstitutional.

- The Bombay High Court recently invalidated a section of a central government memorandum, which allowed public sector banks to seek the issuance of lookout circulars (LoCs) for wilful defaulters.
- The court ruled in the case of **Viraj Chetan Shah v Union of India**, stating that this provision violated fundamental rights to life (Article 21) and equality (Article 14).

Wilful Defaulter:

- A wilful default occurs when a borrower **deliberately fails** to repay a loan despite possessing the means to do so.
- **Large defaulter**: it is a borrower with the balance of **Rs. 1 crore or more**. Whose account has been marked as doubtful or a loss.
- **Misuse of Funds**: Another scenario of wilful default arises when the borrower diverts the borrowed funds for purposes other than the intended use.
- **Asset Disposal**: Wilful default also includes all situations where the borrower sells or disposes of the asset pledged as collateral for the loan.
- **Penalty Threshold**: Any borrower classified as a wilful defaulter with an outstanding balance of Rs 25 lakh or more is subject to penal provisions.
- **Threshold Application**: The Rs 25 lakh limit also applies when funds are misused.

Prohibitions and Rules for Wilful Defaulters in India

- The concept of a wilful defaulter in India carries significant weight, essentially blacklisting borrowers from financial opportunities.
- **Designation Authority**: Commercial lenders like banks and **NBFCs** have the power to designate borrowers as wilful defaulters.
- Consequences: This designation comes with severe consequences, prohibiting access to:

1. Additional credit facilities from the designating lender.
2. Any credit for new ventures.
3. Issuing equity shares (listed companies).
4. Launching an Initial Public Offering (IPO).
5. Submitting a resolution plan under the Insolvency and Bankruptcy Code.

Evolution of Institutional Arrangements:

- The designation of wilful defaulters by commercial lenders has undergone significant institutional changes over time.
- **Central Vigilance Commission Directive (1998)**: It initiated the first layer of institutional design in 1998.
- It instructed the Reserve Bank of India (RBI) to gather information on wilful defaults exceeding Rs 25 lakh.
- **Parliamentary Standing Committee Recommendations (2000)**: This committee has recommended blacklisting wilful defaulters from institutional finance and equity markets.
- However, it didn't propose adequate procedural safeguards
- **Penal measures**: The RBI circular in 2002 introduced penal measures, which were updated over time due to judicial intervention.
- RBI kept on updating these through circulars, primarily on account of judicial intervention

- **The Insolvency and Bankruptcy Code (IBC) of 2016**: it allowed creditors to take over a defaulted company regardless of the default being wilful or not.
- **Procedural Safeguards**: These safeguards were prioritized in 2019 when the supreme court rulings emphasize the need for proper procedures before designating a will.
- **Natural Justice**: Borrowers must be granted access to relevant investigation material before being labelled a wilful defaulter.
- **Right to Respond**: This aligns with the concept of allowing inspection of documents in securities law enforcement proceedings.
- **The rights of wilful defaulters**: In September 2023, the RBI provided an initial guideline proposing changes to the procedures aimed at better protecting the rights of wilful defaulters and those with significant defaults.

Reasons for Criticism with Lenders Classifying Wilful Defaulters:

- **Lender as Judge**: Banks and NBFCs, who are parties to the loan agreement, are responsible for classifying borrowers as wilful defaulters. This raises concerns about impartiality.
- **Shifting Blame**: A lender's poor initial credit assessment could lead to a default.
- However, the system incentivizes the lender to classify the borrower as wilful, deflecting blame.
- **No Impact on Lender**: Wilful defaulter designation doesn't affect the lender's financial obligations, further raising questions about their objectivity.
- This structure violates the principle of natural justice: **"nemo judex in causa sua"** (no one can be a judge of their own cause).

Recently, The Delhi High Court emphasized the need of teaching minors about the concept of "virtual touch" alongside traditional notions of "good touch" and "bad touch."

- **Objective**: in today's virtual world, this step will help them identify potential risks in cyberspace.

Virtual Touch:

- Virtual touch technology creates a way to interact with digital content using hand movements like touching, even though it's not real touch.

Applications:

- **Virtual reality**: VR technology builds simulated environments using computers.
- It allows users to be fully immersed in a 3D experience
- **Augmented Reality (AR)**: This technology lets you see and interact with virtual stuff that appears to be right there in your surroundings, making the real world more interactive.
- **Gaming**: Virtual Touch takes gaming to a new level. Players can control characters, objects, and menus with simple gestures, making gameplay smoother and more intuitive.
- **Smartphones and Tablets**: The touchscreens you use on your phone or tablet rely on virtual touch.
- **Haptic Technology**: This technology increases interaction with Digital products through simulation of senses by using forces, motions, and vibrations.
- It increases immersion in **virtual reality** or **remote control applications**.
- For example: Touching a virtual button on a scream makes us feel like clicking or a buzzing.
- It helps people to navigate, type, and interact with apps using simple touches on the screen.
- Haptic technology: This technology is sometimes called **kinaesthetic communication** or **3D touch**.

- It creates a sense of touch for users by using forces, vibrations, or motions.

Technologies:

- **Gesture Recognition**: Gesture recognition is a computer skill that uses math algorithms to understand and respond to human gestures.
- **Electrostatics**: In some touchscreens, electromagnetic phenomena is used to detect the proximity of fingers without making direct contact.
- *Challenges:*
- **Fidelity Challenges**: The replication touch in virtual experiences, like in video games or virtual reality, it's hard to make it feel just like real touch.
- Things like texture, temperature, and how hard or soft something feels are tough to copy accurately.
- This can make virtual stuff feel fake and not as engaging.
- **Hardware Limitations**:
- Existing haptic technology relies on bulky devices or gloves.
- These devices can hinder movement and user comfort.
- To encourage more people to use this technology, there is need
- More advanced interfaces.
- User-friendly designs.
- Equipment that is easier to use and more comfortable.
- **Accuracy and Latency Concerns**: There is a need of Precise hand tracking and real-time response for seamless virtual touch experience.
- Delays or jittery movements can disrupt the sense of immersion and lead to frustration.
- **Privacy and Security Issues**: Virtual touch technology may collect and analyze hand movement data, posing privacy risks.
- Therefore, there is a need to establish clear guidelines and provide users with control over data collection are crucial for addressing privacy and security concerns.

Components of "Virtual Touch" Education:

1. Teaching appropriate online behavior.
2. Recognizing warning signs of predatory behavior.
3. Understanding privacy settings and online boundaries.

Significance of "Virtual Touch Education":

"Education on Virtual Touch' holds significance as it provides users, particularly minors, with essential knowledge and abilities to safely and responsibly maneuver through the expanding digital realm. Here's why it's crucial:"

- *Ensuring Safe Online Navigation:*
- Virtual touch education provides users, especially minors, with the necessary knowledge and skills to navigate the digital landscape securely and responsibly.
- Users learn about setting online boundaries and appropriate behavior, helping them identify warning signs and steer clear of potentially risky online situations.
- *Safeguarding Privacy:*
- Understanding the implications of virtual touch technology on data collection empowers users to make informed decisions regarding their privacy settings and the use of their personal information.
- Users gain insight into how their data may be collected and utilized, enabling them to protect their privacy effectively.
- *Preventing Cyberbullying:*
- Recognizing inappropriate virtual touch interactions enables users to shield themselves from cyberbullying and online harassment.
- By understanding what constitutes inappropriate behavior, users can take proactive measures to safeguard their well-being and maintain a positive online experience.

The Supreme Court ruled that advocates cannot be held liable under the Consumer Protection Act of 1986 for deficiency in service.

- **Indian Medical Association vs V P Shantha (1996)**: SC ruled that the definition of **"services" under the Consumer Protection Act, 1986** included the medical and healthcare sectors, provided a fee was paid.

Consumer Protection Act (CPA) 2019:

- The **CPA 2019** replaced the CPA 1986 to address modern consumer issues in the digital age.
- Its objective is to provide effective safeguards to consumers against defective products, unsatisfactory services, and unfair trade practices.
- The Act established the **Central Consumer Protection Authority (CCPA)** to regulate matters relating to consumer rights violations, unfair trade practices, and misleading advertisements.
- **Consumer Disputes Redressal Commissions (CDRCs)** are set up at the national, state, and district levels to handle consumer complaints.

Key Features of CPA 2019:

- **Broad Definition of Consumer**: The definition includes transactions through online and offline modes, teleshopping, direct selling, and multi-level marketing.
- **Product Liability**: Manufacturers and service providers are responsible for compensating consumers for any harm caused by defective products or deficient services.
- **Unfair Trade Practices**: Expanded to include non-issuance of bills/receipts, refusal to accept returned goods within 30 days, and disclosure of personal information.
- **E-Commerce Regulation**: Specific provisions are included to regulate e-commerce and direct selling.
- **CCPA Powers**: The authority can take **suo-moto actions**, recall products, order reimbursements, cancel licenses, impose penalties, and file class-action suits.

- **Mediation**: Provision for mediation cells at national, state, and district levels to resolve disputes amicably.
- **Enhanced Jurisdiction**: Increased pecuniary jurisdiction for district, state, and national commissions to reduce the workload on higher commissions.
- **Penalties for Misleading Advertisements**: Penalties of up to INR 5 million for endorsers not exercising due diligence before endorsing products.

6 Consumer Rights under CPA 2019:

- **Right to Safety**: Protection against goods and services hazardous to life and property.
- **Right to be Informed**: Information about the quality, quantity, potency, purity, standard, and price of goods or services.
- **Right to Choose**: Access to a variety of goods and services at competitive prices.
- **Right to be Heard**: Representation of consumer interests in appropriate forums.
- **Right to Redressal**: Redress against unfair trade practices, restrictive trade practices, or unscrupulous exploitation.
- **Right to Consumer Education**: Knowledge about consumer rights and responsibilities to make informed choices.

Draft Digital Competition Bill 2024.

Digital Competition Bill 2024:

- The Digital Competition Bill 2024 addresses the evolving challenges in digital markets.
- It introduces an **"ex-ante"** regulatory framework, aimed primarily at major digital enterprises to prevent anti-competitive practices before they manifest.
- The Bill is inspired by global precedents, notably the **EU's Digital Markets Act**, and seeks to adapt similar regulatory strategies.

Key Provisions:

1.Predictive regulation:

- A forward-looking, preventive, and **presumptive law** (an ex ante framework), which foresees the potential harms that can arise out of antitrust issues and prescribes pre-determined no-go areas is perhaps the way forward. This is one of the foremost proposals in the draft Bill.

2.Significant entities:

- The Bill proposes that for certain **"core digital services"** like search engines, and social media sites, the **Competition Commission of India (CCI)** should designate companies as **"Systematically Significant Digital Enterprise (SSDE)"** depending on various quantitative and qualitative parameters such as turnover, user base, market influence etc.
- **Systemically Significant Digital Enterprises (SSDEs):** These are entities with a substantial user base and specific financial benchmarks.
- SSDEs are mandated to adhere to stringent regulatory conditions to promote fair competition.
- **Thresholds for Classification**:
- *If in **the last 3 financial years**, its turnover in India is **not less than Rs 4,000 crore**; or its global turnover is not less than $30 billion; or*
- *Its gross merchandise value in India is not less **than Rs 16,000 crore**; or*
- *Its **global market capitalisation** is not less than $75 billion; or*
- *The core digital service provided by these companies should also have at least 1 crore end users, or 10,000 business users.*
- Non-compliance with these criteria and reporting requirements could result in penalties.

Associate Digital Enterprises (ADEs): Larger corporate groups that offer core digital services and have multiple entities must identify and declare all related ADEs.

- Both SSDEs and ADEs are subject to similar regulatory obligations.

Need for the Bill:

- Currently, India follows an ex post antitrust framework under the **Competition Act, 2002**.
- The rapid dominance of large digital firms has the potential to irreversibly tip the scales of the market, which the current **ex-post regulatory framework (which acts after violations have occurred)** struggles to address effectively.
- The Bill aims to provide timely interventions to prevent potential market abuses and maintain competitive digital markets.

The Ministry of Home Affairs warns of 'digital arrest' scam by cyber criminals impersonating police officials.

Digital Arrest:

- Digital arrest scams involve cybercriminals impersonating law enforcement officials, such as police or customs officers, to deceive victims into believing they face legal consequences for fabricated offenses.
- Scammers use **psychological manipulation**, creating fear and urgency, to coerce victims into making payments or **providing personal information to avoid "arrest."**
- These scams typically involve fake calls, emails, or social media messages where the perpetrators claim the victim's involvement in illegal activities such as smuggling or fraud.
- Victims are often asked to provide sensitive information or make payments to clear their name from false accusations.
- The scam can lead to significant financial losses and personal data theft, with cases reported across multiple states in India.

Cybercrime:

- Cybercrime encompasses criminal activities conducted using computers and the internet, including hacking, identity theft, phishing, and the spread of malware.
- Common types of cybercrime include financial fraud, data breaches, online harassment, and cyber espionage.
- The impact of cybercrime includes financial losses, theft of personal data, and damage to the reputation and trust in digital systems.
- Cybercriminals employ various techniques such as **social engineering**, exploiting software vulnerabilities, and sophisticated phishing schemes to carry out their activities.
- The rise of cybercrime has led to increased efforts in cybersecurity measures, regulatory frameworks, and public awareness to combat these threats effectively.

Ministry Of Renewable Energy Issued A Warning To Farmers On PM-KUSUM Website Against Fake Websites And Mobile Applications.

The Ministry of Renewable Energy recently issued a warning to farmers on PM-KUSUM website against fake websites and mobile applications that provide fake online application forms and demand registration fees for installing solar water pumps under PM Kusum scheme.

PM-KUSUM Scheme:

- The PM-KUSUM Scheme was launched in 2019 for **de-dieselisation** of the farm sector and enhancing the income of farmers.
- It is aimed at **ensuring energy security** for farmers in India, along with honouring India's commitment to increase the share of installed capacity of electric power from **non-fossil-fuel sources to 40% by 2030** as part of **Intended Nationally Determined Contributions (INDCs).**
- The scheme aims to add Solar capacity of about **34,800 MW by March 2026** with the total Central Financial support of Rs 34,422 crore.

- Nodal Ministry: **Ministry of New and Renewable Energy (MNRE)**
- Under the Scheme, a central government subsidy upto 30% or 50% of the total cost is given for the installation of standalone solar pumps and also for the **solarization of existing grid-connected agricultural pumps.**
- Further, farmers can also install grid-connected solar power plants up to 2MW, under the Scheme on their barren/fallow land.
- This scheme is being implemented by the designated departments of the State Government.

The Scheme consists of three components:

Component A:

- 10,000 MW of solar capacity through the installation of **small Solar Power Plants** of individual plants of capacity up to 2 MW.
- The solar power plants will be preferably installed within five-kilometre radius of the notified sub-stations in order to avoid high cost of transmission lines and losses.
- The power generated will be purchased by the **local DISCOM at a pre-fixed tariff** determined by the respective **State Electricity Regulatory Commission (SERC).**

Component B:

- Installation of 20 lakhs of **standalone Solar Powered Agriculture Pumps.**
- Individual farmers will be supported to install standalone solar Agriculture pumps of capacity up to 7.5 HP for the replacement of existing diesel Agriculture pumps / irrigation systems in off-grid areas, where grid supply is not available.
- The State Government will give at-least subsidy of 30% and the remaining will be provided by the farmer.

Component C:

- For Solarisation of 15 Lakh Grid Connected Agriculture Pumps.

- Under this Component, individual farmers having grid connected agriculture pump will be supported to solarise pumps.
- The farmer will be able to use the generated solar power to meet the irrigation needs and the excess solar power will be sold to DISCOMs at pre-fixed tariff.

Eligible categories for KUSUM Scheme are:

1. An individual farmer.

2. A group of farmers.
3. FPO or Farmer producer organization.
4. Panchayat.
5. Co-operatives.
6. Water User Associations.

The Supreme Court recently observed that the extraordinary powers under Article 142 of the Constitution of India is an exception to the doctrine of merger and the rule of stare decisis to do complete justice between the parties.

Doctrine of Merger:

- It is a common law doctrine founded on the principle of maintenance of decorum and propriety in the functioning of courts and tribunals.
- The doctrine of merger provides that when an appellate court passes an order, the order passed by the lower court is merged with that order.
- The underlying logic is **that there cannot be more than one decree or operative order governing the same subject matter at a given point of time.**
- The doctrine solves the issue of **which order must be enforced** and given importance if there are multiple orders passed by both subordinate and superior courts on a single issue.
- It clarifies and provides that in this situation, the order passed by the superior court or the successive order would prevail and that the order of the lower court would be merged with the order passed by the superior court.
- The doctrine is **not recognized statutorily** but is a statement of judicial propriety and seeks to instil discipline in the functioning of subordinate adjudicating authorities, whether judicial, quasi-judicial, or administrative.

Doctrine of Stare Decisis:

- The doctrine of Stare Decisis refers to **the concept that courts must follow previously made judicial decisions** in cases where the same legal issues are brought before them in subsequent matters.
- It means that courts refer to previous, similar legal issues to guide their decisions.
- Such previous decisions that courts refer to are known as **"precedents".**
- Precedents are legal principles or rules that are created by the decisions given by courts.
- Such decisions become an authority or an example for the judges to decide similar legal cases/issues in the future.
- The doctrine of Stare Decisis creates an obligation on courts to refer to precedents when taking a certain decision.

Recently, The Supreme Court Agreed with the Election Commission's view that Article 329(b) restricts judicial interference.

- Earlier, Association for Democratic Reforms (ADR), an NGO, sought directions to the Election Commission (EC) to publish booth-wise voter turnout figures and to make the Form 17C vote tally records available online within 48 hours of polling for each phase of the ongoing Lok Sabha polls.
- Therefore, adjourned ADR's request for the Election Commission to release voter turnout data.
- **Article 329(b)** invoked by EC in SC that **restricts judicial intervention in poll process.**
- *Article 329:*
- Enshrined in **Part XV** of the Constitution (**Articles 324-329** specifically discuss elections).

- **Article 329**, which has two clauses, concerns itself with the role of the judiciary in electoral matters.
- Article 329 (a) says the **"Judiciary is not allowed to challenge the constitutionality of laws relating to the boundaries of electoral districts or the allocation of seats".**
- Article 329 (b) says that **"Any challenges to the conduct or results of elections to the Houses of Parliament or state legislatures must be made through a designated legal process that is referred to as an "election petition".**
- The **19th Amendment Act of 1966** refined clause (b) of Article 329, **stipulating that election-related inquiries are exclusively addressed through election petitions presented to the authority designated by that law.**
- The Representation of the People Act, 1951, furthers this clause as **it empowers the high courts to hear and decide election petitions**.
- A decision in such petitions can be challenged in the Supreme Court.
- *Several Judicial Pronouncements Outlined the Contours of Article 329(b):*
- **Ponnuswamy (AIR 1952 SC 64) :** In *a Ponnuswami v. Returning Officer*, Namakkal Constituency, SC has emphasized what is implicit in Art. 329 (b) that once the process of election has started, it should not be interrupted since the tempo may slow down and the early constitution of an elected parliament may be halted.Therefore, think twice before obligating a hearing at a critical stage when a quick repoll is the call.
- **Venkatachalam vs A.Swamickan Case (1999)** : The Supreme Court in that case determined that Article 329(b) is inapplicable if the matter pertains to **Articles 191 and 193**, which deal with **disqualifications and penalties related to parliamentary and legislative assembly membership**, respectively.
- The judgment further held that **the word "election" would include every process of proceedings after the issuance of election notification.**

- **Inderjit Barua vs Election Commission of India (1985) :** In that case, the Supreme Court **excluded electoral roll preparation from the definition of "election."**
- It further said that no election could be challenged on the grounds of defects in electoral rolls.
- **Gujarat High Court judgment in N.C. Patel vs State of Gujarat (2007):** The HC affirmed that election petitions can only be filed under the Representation of People's Act, 1951, and not by way of a writ petition.
- **Allahabad High Court in Hari Krishna Lal vs Atal Bihari Bajpai (2002) :** clarified that only candidates officially recognised by the Election Commission are eligible to file election petitions.
- By merely filing a nomination paper, a person does not become a duly nominated candidate.
- A candidate becomes a nominated candidate when the **EC recognises him to be a valid candidate** fulfilling all the statutory obligations.

According to Reporters Without Borders (RSF for Reporters sans Frontières), India's position in the World Press Freedom Index declined from 36.62 to 31.28.

World Press Freedom Index:

- The index is compiled by **RSF** annually assessing the ability of journalists to work and report freely and independently.
- **Reporters Without Borders (RWB)**: It is an international non-profit organization governed by principles of democratic governance. It defends the right of every human being to have access to free and reliable information.
- Headquarter: **Paris**

- **Press Freedom**:It is the ability of journalists to select, produce, and disseminate news in the public interest independent of political, economic, legal, and social interference and in the absence of threats to their physical and mental safety.

Report analysis:

- **India's Ranking**: India's rank improved from **161 in 2023 to 159 in 2024**. However, this rise was primarily due to other countries slipping in their rankings.
- Scores for India decreased in all categories except for the security indicator in the press freedom questionnaire, which encompasses political context, legal framework, economic context, sociocultural context, and security.
- Ranking of Indian Neighbors: Pakistan ranked 152, Sri Lanka at 15, Nepal at 74 and Maldives at 106.
- Afghanistan is at 178, Bangladesh at 165 and Myanmar at 171.
- **Asia-Pacific Region**: It is the world's second most difficult region for practicing journalism.
- Five countries are among the world's ten most dangerous countries for journalism. Myanmar (171st), China (172nd), North Korea (177th), Vietnam (174th) and Afghanistan (178th).
- Middle East and North Africa: The situation is "very serious" in nearly half of the countries.
- The United Arab Emirates joins the eight other countries in the **red zone on the map**: Yemen, Saudi Arabia, Iran, Palestine, Iraq, Bahrain, Syria and Egypt.
- Palestine, occupied and under bombardment by the Israeli army, and the deadliest country for journalists, is at the bottom of the Index.
- Countries with Good Press Freedom: The countries where press freedom is "good" are all in Europe, and more specifically within the European Union, which has adopted its first media freedom law (EMFA).
- **Norway(1st)** is followed by Denmark (2nd) and Sweden (3rd).

Concern Raised by the Index:

- **Global Press Freedoms Under Threat**: Political authorities, who are supposed to safeguard press freedom, are increasingly becoming threats to it.
- Press freedoms have experienced a decline, with an average decrease of 7.6 points globally.
- **Use of AI for Election Manipulation**: Increasing use of artificial intelligence(AI) is raising concerns, particularly its application in propagating disinformation for political motives.
- Deep Fakes are now being used to influence the course of elections.

DEFENCE & SPACE

Eye on modernising submarine fleet, Indian Navy floats Rs 60,000 Crore tenders.

- A massive Rs 60,000 crore contract to modernize the Indian Navy submarine fleet to build six stealth submarines equipped with **Air Independent Propulsion (AIP)** technology has started with trials of competing teams at **Mazagaon Docks**, Mumbai.
- What is AIP?
- With the emergence of submarines, there was a problem finding satisfactory forms of propulsion underwater.
- Traditional **diesel-electric submarines** need to surface frequently to charge their batteries and have an underwater endurance of only a few days.
- As battery technology improved, the endurance of these submarines increased proportionally. But it was not enough to last them beyond a week.
- In **1908**, the **Imperial Russian Navy** launched the **submarine Pochtovy**, which used a **gasoline engine** fed with compressed air and exhausted underwater.

- These two approaches, the use of a fuel that provides energy to an **open-cycle system**, and the **provision of oxygen to an aerobic engine in a closed cycle, characterise AIP today**.
- Most of these systems generate electricity, which, in turn **drives an electric motor** for propulsion or recharges the boat's batteries.
- The introduction of AIP vastly improved the underwater endurance of these submarines and gave them a distinct advantage.
- AIP is mostly implemented as **an auxiliary source**, with the traditional diesel engine handling surface propulsion.
- AIP technology can be installed on existing, older-generation submarines by inserting a new hull section during a retrofit.
- A typical conventional power plant provides **3 megawatts maximum**, and an AIP source around 10 percent of that. A nuclear submarine's propulsion plant is much greater than **20 megawatts**.
- *Advantages of AIP system:*
- It allows the submarines to stay for longer hours in the water.
- It decreases the noise levels made by the submarines. This makes it hard to detect the submarines.
- **Types of AIP**: Open-cycle systems, Closed-cycle diesel engines, Closed-cycle steam turbines Stirling cycle engines and Fuel cells.
- The Defence Research and Development Organisation (DRDO) is using the fuel cells-based AIP System. It is unique as **hydrogen is generated onboard**. The plant was operated in endurance mode and max power mode as per the user

requirements. The system is being developed by the **Naval Materials Research Laboratory (NMRL)** of DRDO.

- *Types of Submarines:*
- **Conventional or Diesel-electric submarine**: They need atmospheric oxygen to run the diesel generator, which in turn charges the batteries.
- **Nuclear Submarine**: It is a submarine powered by a nuclear reactor, but not necessarily nuclear-armed. They have considerable performance advantages over conventional submarines.

India's first indigenous bomber UAV aircraft, the FWD-200B, developed by Flying Wedge Defence, an Indian defence and aerospace company, was unveiled recently.

FWD-200B:

- It is an **indigenous** military grade **bomber** unmanned aerial vehicle **(UAV).**
- It is **India's first indigenous unmanned bomber aircraft**.
- It is designed and manufactured **by Flying Wedge Defence and Aerospace Technologies**, an Indian defence and aerospace company.
- It has a payload capacity of 100 kg and is classified as a **MALE (medium-altitude, long-endurance)** Unmanned Combat Aerial Vehicle.
- **The Unmanned Aerial System (UAS)** consists of optical surveillance payloads and is integrated with missile-like weapons for precision air strikes.
- It has a maximum speed of 370 kmph (200 knots), an endurance capacity of 12 to 20 hours, and a ground control station range of 200 km.
- At six metres long, with an eight-metre wingspan, the aircraft can carry a maximum take-off weight of 498 kg and has an operational altitude of 9,000 feet above mean sea level.

The Army and the Indian Air Force will likely have their MQ-9B Predator Drones in Gorakhpur and Sarsawa.

MQ-9B Predator drone:

- The **MQ-9B Predator** drone is an unmanned aerial vehicle, also known as **"Predators."**
- It includes two variants: **SkyGuardian** and **SeaGuardian**.
- SkyGuardian is a **remotely piloted aircraft system** (RPAS) that serves as the next generation of RPAS.
- SeaGuardian, used by the Indian Navy since 2020, is a maritime-focused version of the SkyGuardian.
- The MQ-9B series are **High Altitude Long Endurance (HALE) drones**, capable of flying for over 40 hours in all types of weather, utilizing a satellite.
- Total of 31 MQ-9B Predator drones are distributed as follows:
- Indian Navy has **15 SeaGuardian drones**.
- The Army and the Indian Air Force each have **eight** SkyGuardian drones.
- Equipped with advanced technologies such as Multi-mode Radar and an electro-optical/infrared (EO/IR) sensor.

Capable of multiple roles, including:

1. Offensive missions
2. Surveillance
3. Reconnaissance
4. Intelligence operations
5. Over-the-horizon targeting
6. Airborne early warning
7. Electronic warfare

The Border Roads Organisation (BRO) is preparing to commence the construction of the Shinkun La Tunnel.

Shinkun La Tunnel:

- It is an upcoming motorable tunnelunder the 16,580 feet high **Shinku-La pass** between Himachal's **Lahaul valley** and **Ladakh's Zanskar valley**.
- It is located on the **Nimu-Padam-Darcha Road** link.
- The length of the tunnel will be **4.1 km**.
- After completion, the Shinku-la tunnel **will be the longest high altitude highway tunnel in the world.**
- The Border Roads Organization (BRO) will construct the tunnel at a cost of Rs. 1,681.5 crores.
- It will provide all-weather road connectivity to Ladakh, and this will be the shortest route to the border areas of Ladakh.
- It is expected to streamline the transportationof heavy machinery to strategic locations such as Kargil, Siachen, and the Line of Control (LOC), reducing travel distances by approximately 100 km.
- The traffic movement in the tunnel will not be vulnerable to long-range artillery shelling or missile firings, either by China or Pakistan.

Border Roads Organisation (BRO):

- It is a road construction executive force in India that provides support to the Indian Armed Forces.
- **Establishment**: It was formed on **7 May, 1960**, to secure India"s borders and develop infrastructure in remote areas of the north and north-east states of the country.
- It develops and maintains road networks in India"s border areas and friendly neighboring countries.
- This includes infrastructure operations in 19 states and three union territories (including Andaman and Nicobar Islands) and neighboring countries such as Afghanistan, Bhutan, Myanmar, Tajikistan, and Sri Lanka.

- Officers and personnel from the **General Reserve Engineer Force (GREF)** form the parent cadre of the BRO.
- It is also staffed by officers and troops drawn from **the Indian Army"s Corps of Engineers** on extra regimental employment (on deputation).
- BRO is also included in the **Order of Battle** of the Armed Forces, ensuring their support at any time.
- Motto of the organization: **Shramena Sarvam Sadhyam** (everything is achievable through hardwork).

ISRO successfully conducts a long duration test of the PS4 engine of the PSLV stage.

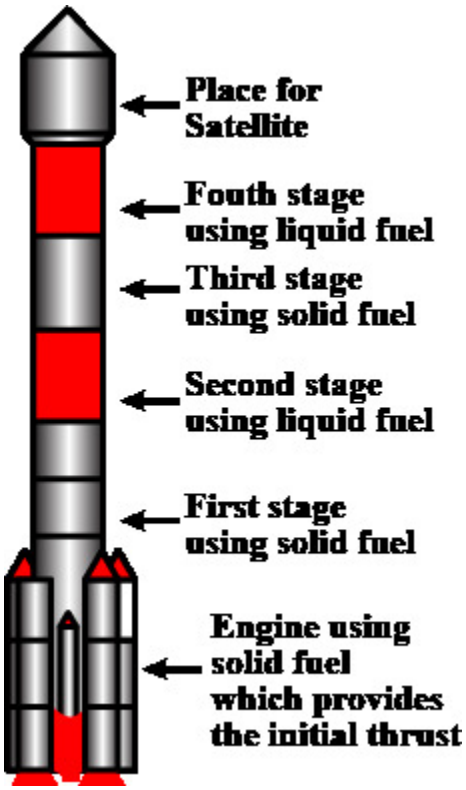
- The Indian Space Research Organisation (ISRO) achieved yet another milestone in design and manufacturing by successfully conducting a long duration test of the PS4 engine of the PSLV stage.

PS4 engine:

- It is the **uppermost stage** of Polar Satellite Launch Vehicle (PSLV), comprising **two Earth storable liquid engines**.
- It uses a bipropellant combination of **nitrogen tetroxide** as the oxidizer and **monomethyl hydrazine as the fuel**, developed by Isro"s **Liquid Propulsion Systems Centre.**
- The same engine is also used in the **Reaction Control System (RCS) of the first stage (PS1) of PSLV.**
- ISRO redesigned the conventionally manufactured PS4 engine to make it compatible with additive manufacturing techniques and this innovative approach, known as **Design for Additive Manufacturing**, has yielded remarkable advantages.

What is Additive Manufacturing?

- It is also known as **3D printing** which is an emerging technology that is rapidly transforming manufacturing processes worldwide.
- It creates **3-dimensional objects** by successively layering materials under computer control.
- It involves layering materials like plastics, composites, or bio-materials to create objects that range in shape, size, rigidity, and colour.
- Compared to traditional subtractive techniques, 3D printing offers immense design flexibility, reduced waste, and the ability to produce complex geometries.

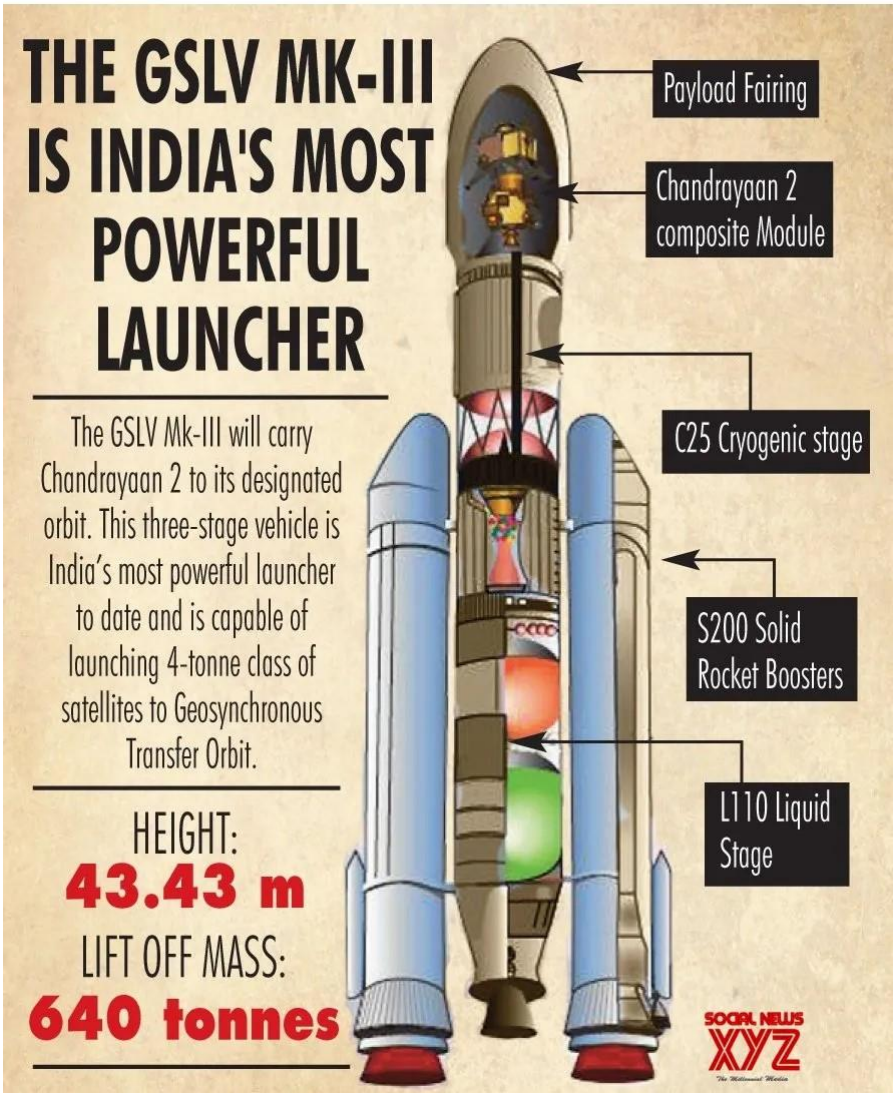


New Space India Limited (NSIL) has called on private players to manufacture its largest launch vehicle LVM3 (Geosynchronous Satellite Launch Vehicle Mk III).

LVM3:

- LVM3 is also known as **Fat Boy** and is designed for launching spacecraft weighing up to 4000 kg into **Geosynchronous Transfer Orbit (GTO).**

- It is a **three-stage** launch vehicle.
- The first stage includes **two S200 solid propellant strap-ons**, which are among the largest solid boosters in the world, containing 204 tonnes of solid propellant.
- The second stage, or **the core stage**, is the L110 **liquid stage**, utilizing a twin liquid engine configuration with 115 tonnes of liquid propellant.
- The **third stage is the C25 cryogenic stage**, equipped with a fully indigenous high thrust **cryogenic engine (CE20),** loaded with 28 tons of propellant.
- Important components include the equipment bay (EB) and the Encapsulated Assembly (EA), which comprises the spacecraft, Payload Adapter (PLA), and Payload Fairing (PF).
- LVM3 has been utilized in missions like **Chandrayaan-2** and **Chandrayaan-3** and is slated for use in the upcoming **Gaganyaan Mission**.



SKAMPI, a prototype telescope of the Square Kilometre Array Observatory (SKAO), has achieved its first light.

Square Kilometre Array Observatory (SKAO):

- SKAO is an intergovernmental organization with member states and partners from five continents.

- The organization is headquartered in the United Kingdom.

Member Countries:

- It currently has **9 member countries**: Australia, China, Italy, Netherlands, Portugal, South Africa, Spain, Switzerland, and the UK.
- Prospective members in the process of joining include Canada, France, Germany, India, Japan, South Korea, and Sweden.

Construction and Locations:

- SKAO plans to construct the **world"s largest radio telescope** with facilities in South Africa and Australia.
- In South Africa, 197 mid-frequency antennas will form the SKA-Mid telescope.
- In Western Australia, 1.31 lakh low-frequency antennas will form the SKA-Low telescope.
- Both sites are situated in radio-quiet zones to avoid interference.

Technology and Capabilities:

- The SKAO aims to use **interferometry**, connecting numerous smaller antennas via optical fiber networks to function as a **single vast virtual telescope**.
- SKAO will be the most powerful radio telescope, capable of observing up to **3,000 trillion km** into the universe.

Science Goals and Functions:

- SKAO's main science objectives include studying the **evolution of the universe, tracking gravitational waves, and examining cosmic magnetism**.
- It will enable detailed studies of galaxies and stars, test theories of gravity, and more.

Prototypes and Testing:

- The SKAMPI prototype in South Africa captured images at **2.5GHz wavelength**, revealing characteristic radio emissions from the Milky Way and external galaxies like Centaurus A.

- This prototype aims to refine the design of the SKA-Mid dishes and has delivered high-quality data during its testing phase.
- The first antenna of the SKA-Low was installed in March 2024 in Western Australia.
- Contributions and Development
- Over ten countries are involved in this multi-billion-dollar project, including key players like Canada, China, Germany, France, and India.
- India has committed to contribute Rs. 1,250 crore to the project.

INS Kiltan, one of the P28 (Project 28) Anti-Submarine Warfare (ASW) Corvettes, recently visited Brunei and the Philippines.

P28:

- P28 aimed to build four indigenous **ASW corvettes or Kamorta class corvettes**, namely, **INS Kamorta, INS Kadmatt, INS Kiltan, and INS Kavaratti.**
- They can be deployed in nuclear, biological, and chemical warfare conditions and have been constructed using high-grade **DMR 249A** steel produced in India.
- The ships are equipped with a Combat Management System, Torpedo Tube Launchers, and an Infra-Red Signature Suppression System, among other features.

INS Kiltan:

- It is an **indigenously-built anti-submarine warfare** stealth corvette.
- This is the third of the four Kamorta-class corvettes being built under Project 28.
- The ship derives its name from one of the **islands in the Aminidivi group** of the strategically located Lakshadweep and Minicoy group of islands.
- Designed by the Indian Navy's in-house organisation Directorate of Naval Design and built by Garden Reach Shipbuilders & Engineers (GRSE) in Kolkata
- *Features:*

- It is India's first major warship to have a **superstructure of carbon fibre** composite material resulting in improved stealth features, lower top weight and maintenance costs.
- The ship hosts a predominantly indigenous cutting-edge weapons and sensors suite which includes heavyweight torpedoes, ASW rockets, 76 mm caliber Medium Range gun and two multi-barrel 30 mm guns as close-in-weapon system (CIWS) with dedicated fire control systems, missile decoy rockets (Chaff), advanced ESM (Electronic Support Measure) system, most advanced bow mounted sonar and air surveillance radar.

An Indian Air Force (IAF) contingent recently arrived at the Eielson Air Force Base in Alaska to participate in the prestigious multi-national exercise, Red Flag 24.

Red Flag 24:

- It is a **two-week advanced aerial combat** training exercise aimed at integrating aircrew in a multinational environment.
- It is designed to replicate a realistic and challenging environment, bringing together aircrew and equipment from different nations and services.
- Approximately 3100 service members are expected to fly, maintain, and support more than 100 aircraft during the exercise.
- The IAF deployed **Rafale fighter jets** for the Red Flag 24 exercise.
- The exercises can be adapted to integrate various forces into a realistic threat environment using the more than 77,000 square miles of airspace in the Joint Pacific Alaska Range Complex, which is the largest combat training range in the world.
- Since its inception in 1975, Red Flag exercises are designed to create a comprehensive learning environment by simulating realistic combat scenarios.

- There are two distinct Red Flag exercise locations: **Nellis Air Force Base** in Nevada and **Eielson Air Force Base** in Alaska.
- The Nevada exercise is organized by the **United States Air Force Warfare Center (USAFWC)**, while the Alaska exercise is managed by the **Pacific Air Forces (PACAF)**, the air component command of the **United States' Indo-Pacific Command (USINDOPACOM).**

Recently, the Defence Research & Development Organisation (DRDO) successfully flight-tested the RudraM-II air-to-surface missile from Su-30 MK-I platform of the Indian Air Force (IAF) off the Odisha coast.

- DRDO Successfully Flight-Tests RudraM-II Air-to-Surface Missile from Su-30 MK-I Platform

RudraM-II:

- RudraM-II is an Air-to-Surface Missile.
- RudraM-II is an indigenously-developed solid-propelled air-launched missile system.
- **Task**: It is meant for Air-to-Surface role to neutralize many types of enemy assets.
- Rudram, **India's first *anti-radiation missile (ARM)***, is an Air-to-Surface missile developed by DRDO.
- It is developed as part of the Rudram series which includes supersonic and hypersonic ground attack and anti-radiation missiles.
- The name Rudram translates to "remover of sorrows."

Comprises:

- **Navigation System**: The missile uses a navigation mechanism consisting of a satellite-based Global Positioning System (GPS) and an inertial navigation system.
- **Passive Homing Head**: It employs a "passive homing head" for guidance, enabling it to accurately strike targets even if the radiation source switches off during the engagement.

- **Mandate**: To detect, track, and neutralize the enemy's radio frequency sources, including radar, communication assets, and other radio frequency sources.

Future Developments and Advanced Versions:

- **RudraM-1**: It primarily aims at **Suppression of Enemy Air Defenses (SEAD).**
- **RudraM-2 and RudraM-3**: These are under development with ranges of 350 and 550 km, respectively.
- **Significance**: The development of these missiles began around eight years ago, with plans for future tests and inductions to enhance the IAF's air superiority tactical capability.

Recently, Srinivas R Kulkarni, an Indian-origin US scientist has been awarded the prestigious Shaw Prize in Astronomy for 2024.

- Scientist Srinivas R Kulkarni Honoured with Prestigious **Shaw Prize in Astronomy.**
- He has been awarded for his ground-breaking discoveries about millisecond pulsars, gamma-ray bursts, supernovae, & other variable or transient astronomical objects.

Shaw Prize:

- The annual award is given by the Shaw Prize Foundation, which was founded in **2002 by the Hong Kong-based filmmaker**, television executive and **philanthropist Run Run Shaw (1907–2014).**
- It includes a $1.2m cash prize.
- There are also Shaw Prizes for life sciences and medicine; and mathematical sciences.

Astronomical Transients:

- Transients are astrophysical phenomena that **change their brightness over a relatively short time.**

- These can be caused by a number of different astrophysical sources, and each of these transient events has particular characteristics.
- There are many kinds of astronomical transients, all of them united by phenomena that are violent in some measure.
- **Significance**: Astronomers study transients to understand where their violence comes from and what that can tell us about non-transient events.

Kinds of Transients:

- **Supernovae**: when the outer layers of large stars blow up while their cores implode because the stars have run out of elements to fuse.
- Many a supernova has been known to become so bright that it emits light more intensely than the stars in the rest of its host galaxy combined.
- **Active galactic nucleus (AGN):** The centers of massive galaxies host supermassive black holes. Sometimes, these black holes actively feast on matter in their orbit.
- Interactions between the black holes and the matter in this process cause the latter to acquire energy and glow with a changing brightness.
- **Fast radio burst (FRB)**: FRBs are very energetic sources 10-times as much energy as the Sun,which usually only last on the order of milliseconds.

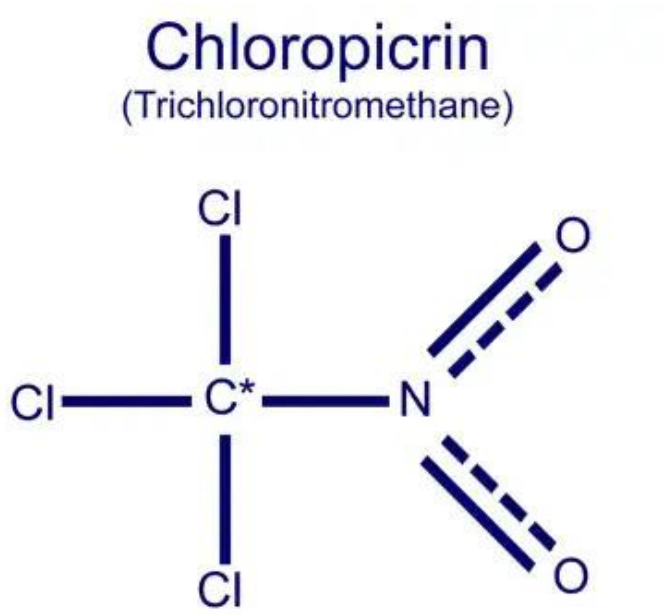
INTERNATIONAL RELATIONS

US accuses Russia of using 'chemical weapon CHLOROPICRIN" in Ukraine

- Russia used chemical agent **chloropicrin** in Ukraine along with the "riot control agents (tear gas) as a method of warfare in Ukraine.

- **Sanctions**: USA announced fresh sanctions against Moscow's military and industrial capabilities which targets nearly 300 entities in Russia, China, and other countries

- ***Chloropicrin:***
- Chloropicrin is a **C-nitro compound** that is **nitromethane** in which all three hydrogens are replaced by chlorines.
- It is a **synthetic C-nitro**, one-carbon, and **organochlorine** compound that is a strong **lachrymator** (**tears-inducing agent**, popular examples: pepper spray, and **bromoacetone**).
- Common names: **Nitrochloroform, Dolochlor,Picfume**
- **Appearance**: Colorless to faintly yellow oily liquid.
- Composed of: It involves a chemical reaction between **sodium hypochlorite (bleach)** and **nitromethane (a common industrial solvent).**
- It can also be made by combining chloroform with nitric acid, which yields chloropicrin and water.



Application:

- **Agriculture**: It is used in agriculture as a soil fumigant particularly for strawberry crops.
- **Antimicrobial agent**: It is employed as a herbicide and **nematicide** and has a role as a fumigant insecticide and an antifungal agrochemical.
- **Chemical warfare agent**: Chloropicrin is an irritant with characteristics of a tear gas having an intensely irritating odor, thus used as a riot control agent.
- **As a weapon of warfare**: It was first used as a **poison gas** in the **First World War**, by both the Allied and the Central Powers and was stockpiled during World War II.
- It induces vomiting, which prompts soldiers to remove their masks, when they would inhale more of the gas, or other gaseous agents dispersed in the air.
- **Exposure**: Chloropicrin can be absorbed systemically through inhalation, ingestion, and the skin. It is a severe irritant, and can cause immediate, severe inflammation of the eyes, nose and throat, and significant injuries to the upper and lower respiratory tract.
- It is also known to be highly toxic and **carcinogenic**.

Chemical Weapons Convention (CWC):

- **Entered into force**: On 29 April 1997
- **About**: It is the **world's first multilateral disarmament agreement** to provide for the elimination of an entire category of weapons of mass destruction within a fixed time frame.
- **Membership**: 193 States Parties to the Convention
- **Implementing Organ**: The Convention led to the birth of an international chemical weapons disarmament regime headed by the **Organisation for the Prohibition of Chemical Weapons (OPCW).**

- **It requires states-parties to declare in writing to the OPCW their chemical weapons stockpiles, chemical weapons production facilities (CWPFs), relevant chemical industry facilities, and other weapons-related information.**
- It is open to all nations and currently has **193 states-parties**.
- **India is a signatory** and party to the **Chemical Weapons Convention.** It has signed the treaty at Paris on **14th day of January 1993.**
- It is pursuant to provisions of the Convention **enacted the Chemical Weapons Convention Act, 2000.**
- **Mandate**:
- To end the development, production, stockpiling, transfer and use of chemical weapons
- To prevent their re-emergence
- To ensure the elimination of existing stocks of such weapons
- To make the world safe from the threat of chemical warfare.
- **Recognition**: The **2013 Nobel Prize for Peace** was awarded to the Organisation for the Prohibition of Chemical Weapons for its extensive efforts to eliminate chemical weapons.

India Contributes $5,00,000 to UN Counter-Terrorism Trust Fund

- India contributed $500,000 to the UN Counter-Terrorism Trust Fund (CTTF), underscoring its unwavering commitment to support multilateral efforts in the global fight against terrorism.
- **Terrorism**: **UN defines terrorism** as "Criminal acts intended or calculated to provoke a state of terror in the general public, whatever the considerations of a political,

philosophical, ideological, racial, ethnic, religious or any other nature that may be invoked to justify them"

- India Contributes $500000 to UN Counter-Terrorism Trust Fund
- **India's Contribution to Fund**: With its current contribution, India's cumulative financial support to the trust fund now stands at $2.55 million.
- India announced its contribution to the trust fund during the special meeting of the counter-terrorism committee held in New Delhi in October 2022 under India's presidency.
- **Significance of Fund**: India's contribution would support global programmes of **United Nations Office of Counter-Terrorism (UNOCT) — Countering Financing of Terrorism (CFT)** and **Countering Terrorist Travel Programme (CTTP).**
- They are aimed at building capacities of the member states of eastern and southern Africa to combat the critical issues of financing of terrorism and prevent the movement and travel of terrorists.

Counter-Terrorism Committee:

- **Background**: In the aftermath of the 11 September attacks against the United States in 2001, the Security Council established a dedicated **Counter-Terrorism Committee (CTC) of the Council.**
- **Members**: It consists of all 15 members of the Security Council, to monitor the implementation of the provisions of resolution 1373 (2001) and other resolutions.
- **Mandate**: It focuses on the following areas:

1. Counter-terrorism strategies
2. Countering the financing of terrorism
3. Border security and arms trafficking
4. Law enforcement
5. Legal issues
6. Human rights

7. Integrating gender into counter-terrorism
8. Countering violent extremism and terrorist narratives
9. Information and communications technologies

- **United Nations Countering Terrorist Travel Programme (CTTP)**: It is a global initiative of the United Nations Office of Counter-Terrorism (UNOCT) which assists beneficiary Member States in building their capabilities to detect and counter-terrorists and serious crimes.
- **Countering Financing of Terrorism (CFT)**: Under this, UNOCT-UNCCT assists Member States in a sequential, coordinated and results-oriented manner on a variety of CFT topics.

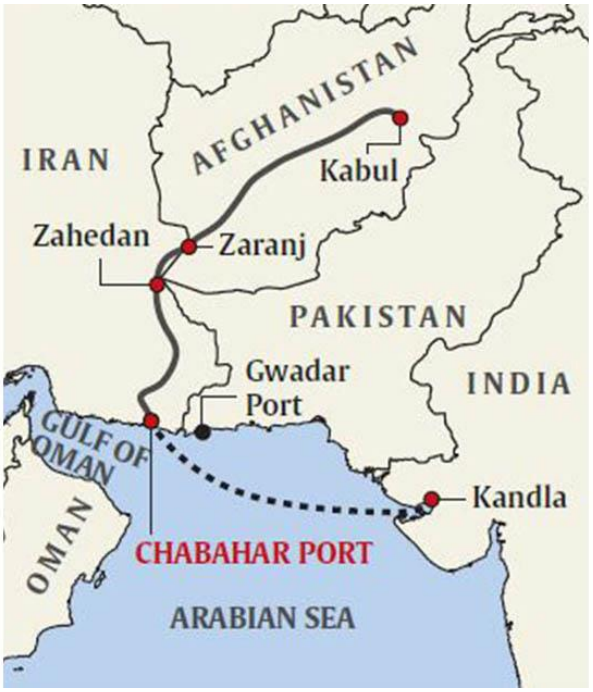
<u>UN Security Council:</u>

- **UN Organ**: The UN Security Council is one of the six main organs of the United Nations. It was established by the **UN Charter in 1945**.
- The other 5 organs of the United Nations are—the **General Assembly (UNGA)**, **the Trusteeship Council**, the **Economic and Social Council**, the **International Court of Justice, and the Secretariat**.
- **Headquarter**: NewYork
- **Primary Responsibility**: Maintaining international peace and security.
- **Council Composition**:
- **Membership**: Consists of **15 Members** (5 permanent, 10 non-permanent).
- **Five permanent members**: China, France, the Russian Federation, the United Kingdom, and the United States.
- **Non-permanent member**: Elected for two-year terms by the General Assembly.
- **Veto**: A "No" vote from one of the five permanent members blocks the passage of the resolution.
- **Presidency**: The Security Council has a rotating Presidency, changing **every month**. (alphabetical Order).

10-year contract signed for the development of Shahid Beheshti Port Terminal at Chabahar Port.

Chabahar Port:

- **Chabahar Port** is located in **Southeastern Iran** in the **Sistan-Baluchistan province,** near the **Gulf of Oman**.
- It comprises two ports**: Shahid Beheshti** and **Shahid Kalantari**.
- It is the only deep-sea port in Iran with direct access to the Indian Ocean.



Strategic Importance

- **Geopolitical Significance:**
- Chabahar Port provides India with a strategic foothold to counter China"s presence at Pakistan"s Gwadar Port.
- It acts as a **gateway to Central Asian countries**, bypassing Pakistan.

- The port enhances connectivity under **the International North-South Transport Corridor (INSTC), linking India to Russia and Europe via Iran**.
- **Economic Importance:**
- Chabahar Port facilitates trade between India, Iran, and Afghanistan.
- It increases trade opportunities with **Central Asian countries**.
- The port has the potential to become a major commercial hub due to its strategic location.

Historical Context and Agreements:

- In May 2016, India signed a **tripartite agreement** with Iran and Afghanistan to develop the Shahid Beheshti terminal at Chabahar Port.
- The recent 10-year operational agreement replaced the annual pact from 2016.
- **Development Projects:**
- The development of port facilities and rail links at Chabahar Port.
- The construction of a rail line from **Chabahar to Zahedan**, enhances connectivity with Afghanistan and Central Asia.
- Investment in port equipment and infrastructure to bolster operational capacity.

The Philippines recently challenged China to open Scarborough Shoal to international scrutiny after it accused Beijing of destroying the shoal"s marine environment.

Scarborough Shoal:

- The Scarborough Shoal (also known in English as the Scarborough Reef) is a series of small rocks and islands which are formed into a **triangle shape in the South China Sea**, located some **220 kilometers from the Philippines**.

- The largest island features a lagoon and is around sixty square miles in area, while many of the rocks are so small they protrude only a metre or so from the sea at low tide and are completely submerged when the tide is high.
- The deep waters around the shoal make it a productive fishing area, rich in marine life, and the lagoon also contains many commercially valuable shellfish and sea cucumbers.
- The shoal is the source of an ongoing and, so far, unresolved dispute between the People's Republic of Chinaand the Philippines, with both countries claiming that the shoal lies within their territory and saying they have exclusive rights to access its waters.
- There are no structures built on Scarborough Shoal, but the feature is effectively controlled by China, which has maintained a constant coast guard presence at the feature since 2012.
- China, which now refers to the shoal as **Huangyan Island,** makes a historical claim to the area, stating that they can trace their ownership of the area back to the **Yuan Dynasty of the 1200s.**
- The Philippines claim the area on the basis of geography, as it is much closer to the Philippines' main island of **Luzon**, which contains the capital, Manila, but lies over 500 miles from China.

The Arab League recently called for UN peacekeeping forces in the Palestinian territories during a summit in Bahrain"s Manama.

- **Arab League:**
- The Arab League, also called the **League of Arab States (LAS),** is a regional organization of Arab states in the Middle East and parts of Africa.
- *Formation:*
- It was formed in **Cairo** on March 22, 1945.
- The league was chartered in response to concerns about **postwar colonial divisions** of territory as well as strong opposition to the emergence of a **Jewish state on Palestinian territory.**
- *Goals:*
- The overall aim of the league is to **promote Arab interests**.

- Its main goals are to strengthen and coordinate the political, cultural, economic, and social programs of its members and to try to settle disputes among them or between them and third parties.
- In 1950, the members also **agreed to provide military support** to help defend each other.
- *Headquarters:* Cairo, Egypt.
- **Official language: Arabic**
- *Members:*
- Currently, it has **22 members**. The founding member states of the league are **Egypt, Syria, Lebanon, Iraq, Jordan, Saudi Arabia, and Yemen.**
- Members who joined later are Libya, Sudan, Tunisia, Morocco, Kuwait, Algeria, Bahrain, Oman, Qatar, the United Arab Emirates, Mauritania, Somalia, the Palestine Liberation Organization, Djibouti, and Comoros.
- The League regards **Palestine as an independent state**.
- There are four nations that were conferred observer status by the League**: Brazil, Eritrea, India, and Venezuela.**

Council:

- The highest body of the league is the Council, composed of representatives of member states, usually foreign ministers, their representatives, or permanent delegates.
- The League makes decisions on a majority basis, but there is no mechanism to compel members to comply with resolutions.
- Each member has one vote on the Council, with decisions binding only on those states that have voted for them.

The Fourth International Conference on Small Island Developing States (SIDS-4) will be convened (May 27-30) in Antigua and Barbuda, North America.

Small Island Developing States (SIDS)

- Small Island Developing States (SIDS) are a distinct group of **39 States and 18 Associate Members of United Nations** regional commissions that face unique social, economic and environmental vulnerabilities.
- **Located**: The three geographical regions in which SIDS are located- **the Caribbean, the Pacific, and the Atlantic, Indian Ocean and South China Sea.**
- **Recognition**: SIDS were recognized as a special case both for their environment and development at the **1992 United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil.**
- **Theme**: Charting the course toward resilient prosperity
- **Aim**: To Assess the ability of SIDS to achieve sustainable development, including the 2030 Agenda and its Sustainable Development Goals.

Support Received:

- **Regional Level**: SIDS are supported by inter-governmental organizations, primarily the **Caribbean Community (CARICOM),** the **Pacific Islands Forum (PIF)** and the **Indian Ocean Commission (IOC).**

UN Programmes of Action in Support of SIDS:

- **Barbados Programme of Action (BPoA), 1994**: It prescribed specific actions that would enable SIDS to achieve sustainable development.
- **The Barbados Declaration** is a statement of political will underpinning the commitments contained in the BPoA.
- **Mauritius Strategy, 2005**: The Mauritius Strategy for further implementation of the BPoA was adopted to address remaining gaps in implementation.
- **SAMOA Pathway, 2014**: It recognizes the adverse impacts of climate change and sea-level rise on SIDS' efforts to achieve economic development, food security, disaster risk reduction and ocean management, among other challenges.

Global Environment Facility & SIDS:

- **The Global Environment Facility** has provided $1.9 billion in grant finance to SIDS through national, global, and regional projects.
- The current GEF-8 funding cycle (2022 – 2026) continues to provide strong support and an emphasis on the needs of SIDS and Least Developed Countries (LDCs).

Recently, North Korea fired a barrage of suspected ballistic missiles toward its Eastern sea.

Sea of Japan

- The Sea of Japan, also known as the East Sea, is a **marginal sea** of the western Pacific Ocean.
- **Bordered by**: It is bounded by Russia and **Sakhalin Island in the north**, by North Korea in the west, South Korea in the southwest, and by the **Japanese archipelago** (Hokkaidō, Honshū, and Kyūshū islands) in the east and south.
- **Deepest Point**: Sea of Japan's deepest point is **Dohoku Seamount**, an underwater volcano.
- **Straits connecting Sea of Japan**: Sea of Japan is connected with the East China Sea in the south via the **Tsushima and Korea straits** and with the **Okhotsk Sea** in the north by the **La Perouse and Tatar straits.**
- In the east, it is connected with the **Inland Sea of Japan** via the **Kanmon Strait** and **the Pacific Ocean by the Tsugaru Strait**.
- **Meeting Point**: The Sea of Japan serves as the meeting point of the cold currents from the north and the warm currents from the south.
- **Largest River**: Tumen or Dooman river is the largest river draining into the Sea of Japan and serves as a border between North Korea, Russia and China.
- **Major Ports**:

- Russia: **Vladivostok**, Sovetskaya Gavan, Nakhodka, **Alexandrovsk-Sakhalinsky**, and Kholmsk.
- North Korea: Hamhung, Chongjin, and Wonsan.
- Japan: **Niigata, Tsuruta and Maizuru.**
- **Marginal Sea**
- A marginal sea is defined as a sea that is **partially enclosed by islands, archipelagos, or peninsulas**. They are usually much **shallower than the open oceans** and are therefore more affected by human activities.

The world will celebrate Immanuel Kant (1724-1804) 300th birth anniversary this year.

Immanuel Kant:

- Immanuel Kant was born on April 22, 1724 in the **East Prussian** city of Königsberg, or today's **Kaliningrad (Russia)** near the southeastern shore of the Baltic Sea.
- He is the central figure in western modern philosophy, setting the terms for much of 19th and 20th century philosophy and synthesizing early modern rationalism and empiricism.
- **Field of work**: He has left indelible imprints in the field of metaphysics, epistemology, ethics, political philosophy, aesthetics etc

Notable Works of Immanuel Kant:

- **The Three Critiques**: The Critique of Pure Reason (1781, 1787), the Critique of Practical Reason (1788), and the Critique of the Power of Judgment (1790) presents the fundamental idea of Kant's "critical philosophy" ie the **human autonomy**.
- **Kant's work on ethics**: It is presented in his book, **The Foundations of the Metaphysics of Morals (1785)** to "search for and establishment of the supreme principle of morality".

Key Ideas of Immanuel Kant:

- **The Idea of a World Citizen**: Immanuel Kant favoured the idea of a global citizenship, whereby there is no restriction to travel, The trade is open and free, unrestricted immigration and the right to refuge and rejected imperialism, colonialism and slavery.
- He believed in reason, rationality and morality guiding political action.
- **The Idea of perpetual peace**: Kant clearly states that perpetual peace is possible only when governments have a specific political organization and the need for the formation of a federation of free countries or international governments to eliminate the tendencies of engaging in war-the worst evil of human societies and achieve perpetual peace.

- **Kant's deontological/ duty based Ethics**: Immanuel Kant believes that the moral worth of an action can be judged not by its outcome but, rather by its motive ie. **He favors Right Means over Ends.**
- The motive behind an action has moral value only when it arises from universal principles discovered by reason.

Relevance of Kant's Idea in Modern World:

- **The Crisis in Multilateralism**: Major power rivalry driven by narrow consideration of power and authority based on expedient rationale, and not rationality is leading to demise of multilateralism.
- Example: The UN Charter was expected to provide a common ethical bedrock for international relations but instead has become a body to please the self-serving rationale of the permanent members of the UNSC.
- **Rationality v/s Rationale**: Rationality is to being guided by reason and logic but they are also shaped by history, collective civilisational and cultural experiences, nationalism, religious beliefs, clan and class loyalties etc giving way to **rationale**, bereft of values or morality.
- Example: Contemporary challenges like terrorism and aggression by nations (Israel- Hamas War) are accepted as **truth by rationale** explanations behind devastating actions.
- **Contemporary Challenges**: Today the world is facing a **war of narratives** that blurs the distinction between reality and fiction whereby reality is often a creation of geopolitical and geo-economic interests.
- Artificial Intelligence and digital revolution altering objective reality and lethal autonomous weapons redefining battlefields. The challenge of fake news, hatred based on identities, global terrorist organisations, The climate crisis etc.
- **Remnants of colonialism**: Kant rejected imperialism, colonialism and slavery but although colonialism and imperialism are deemed to be a closed chapter in history,

but the UN website still lists **17 Non-Self-Governing Territories** as the unfinished agenda of the **Special Committee on Decolonisation**.

- Modern day **economic colonialism** in the form of **debt diplomacy** is posing a significant challenge to the independence of nations.

India's Role:

- India should amalgamate Kant's Western philosophy ideas with our very own ancient philosophies, to provide a new moral compass for a better world.
- India is rediscovering the relevance of its indigenous strategic culture with renewed focus on The great Indian epics (Ramayana and Mahabharata) in the context of statecraft, war and diplomacy through the prism of ethics.
- Indian Philosophers: **Kautilya's Arthashastra** and **Thiruvalluvar's Tirukkural** dwelt on ethics and morality in every aspect of life.
- **Contemporary Amalgamation**: India aims to amalgamate its ancient cultural ethos of serving humanity with modern day realities.
- Example: During its G20 Presidency, India built consensus on the basis of the motto, One Earth, One Family, One Future, inspired by the ideal of **Vasudhaiva Kutumbakam.**

ECONOMICS

The Ministry of Home Affairs (MHA) has cancelled the registration of at least five Non-Governmental Organizations (NGOs) for allegedly violating provisions of the Foreign Contribution Regulation Act (FCRA).

Foreign Contribution (Regulation) Act:

- The FCRA was enacted in **1976** during the **Emergency period** due to concerns about foreign interference in India''s affairs.
- The act regulates foreign donations to ensure operations align with the values of a sovereign democratic republic.

Key Amendments and Provisions:

- **2010 Amendment**: Consolidated laws to regulate the acceptance and utilization of foreign contributions, prohibiting their use for activities detrimental to national interest.
- **2020 Amendment**:
- Tightened government control and scrutiny.
- Prohibited the transfer of foreign contributions to any other person or organization.
- Reduced the limit of foreign contribution usage for administrative expenses from **50% to 20%**.

Registration Requirements:

- Entities must register under the FCRA to receive foreign donations in India.
- Registration is granted for activities in **cultural, economic, educational, religious,** or **social areas.**
- Entities can register under multiple categories, allowing for diverse activities.
- Applicants must open a bank account at a specified branch of the State Bank of India in New Delhi for receiving foreign funds.

Prohibitions and Restrictions:

- The act prohibits funding to **candidates**, **journalists**, **media companies**, **judges, government servants, politicians, and political organizations.**

- Activities such as religious conversion (direct or indirect), involvement in creating communal tension, or sedition are also prohibited.

Validity and Renewal:

- FCRA registration is valid for **five years.**
- NGOs must apply for renewal **within six months** of the registration''s expiry.
- The government can cancel an NGO''s registration for various reasons, including violations of the act or lack of reasonable activity in their chosen field for two consecutive years.
- Once canceled, an NGO **is ineligible** for re-registration for **three years**.

FCRA 2022 Rules:

- Introduced changes in July 2022, increasing the number of compoundable offences from 7 to 12.
- Raised the limit for contributions from relatives abroad that do not require government intimation from Rs 1 lakh to Rs 10 lakh.
- Extended the time limit for intimation of the opening of bank accounts.

The National Bank for Agriculture and Rural Development (NABARD) has sanctioned a study on the impact evaluation of Geographical Indication (GI) products.

NABARD (National Bank for Agriculture and Rural Development):

- NABARD is India''s **apex development bank** dedicated to agriculture and rural development.
- The bank is **fully owned** by the Government of India and operates out of its headquarters in Mumbai.

- Established under the **National Bank for Agriculture and Rural Development Act of 1981**, NABARD focuses on sustainable and equitable development in agricultural and rural sectors.
- *Historical Background:*
- NABARD was established in 1982, following legislation passed by Parliament based on the **B. Sivaraman committee report of 1979.**
- The Reserve Bank of India (RBI) played a crucial role in the formation of NABARD by creating **CRAFICARD** to evaluate institutional credit for agriculture and rural development.
- The foundation of NABARD involved amalgamating the **Agricultural Credit Department**, the Rural Planning and Credit Cell of the RBI, and the **Agricultural Refinance and Development Corporation.**

Transformation of NABARD:

- The NABARD (Amendment) Bill of 2017, passed in 2018, increased its authorized capital from Rs. 5,000 crore to Rs. 30,000 crore.
- This amendment also **transferred RBI"s shares to the central government**, which now holds at least **51% of NABARD"s share capital**.
- NABARD"s scope was expanded to include support for **MSMEs** in the manufacturing and service sectors, with increased financial thresholds.

Structure of Governance:

- NABARD is governed by a Board of Directors, which includes a Chairperson, rural economy experts, three RBI directors, government officials, and elected non-government shareholder members.
- An Executive Committee, a subset of the board, is tasked with handling specific functions delegated by the board.

Functions of NABARD:

- NABARD offers financial and refinance support for rural infrastructure and agricultural development.
- It is involved in developing and implementing government schemes, providing training, and offering marketing support to artisans.
- The bank supervises and supports **Cooperative Banks** and **Regional Rural Banks**, integrating them with modern banking technologies like the **Core Banking Solution**.
- Additionally, NABARD prepares district-level credit plans to guide the banking sector in achieving targets for agricultural credit.

The Reserve Bank of India (RBI) revised the guidelines for custodian banks to issue Irrevocable Payment Commitments (IPCs) in light of the T+1 settlement regime for stocks.

Guidelines:

- **Capital Market Exposure(CME) Limit**: The maximum intraday risk to the custodian banks issuing IPCs would be considered as CME at **30 percent** of the **settlement amount.**
- **Basis for the 30% Risk Limit**: It is based on the assumption of a **20 per cent downward price movement** of the equities **on T+1**, with an additional margin of 10 per cent for further downward movement of price.
- Earlier, the risk mitigation measures were prescribed based on **T+2 rolling settlement** for equities **(T being the trade day).**
- **Eligibility Criteria for Custodian Banks Issuing IPCs**: Only custodian banks, who have an agreement with clients giving them an inalienable right over the securities for receiving a payout in the settlement, are permitted to issue IPCs.
- This clause will not be insisted upon if the transactions are pre-funded.

- **Capital Maintenance in T+1 Settlement Cycle**: Under the T+1 settlement cycle, the exposure shall normally be **intraday**.
- However, if exposure remains outstanding at the end of T+1 Indian Standard Time, the bank will have to maintain capital based on the outstanding capital market exposure.
- Regulation of Bank Counterparty Exposures: The underlying exposures of banks to their counterparties, emanating from the **intraday capital market exposure (CME)**, will be subject to limits prescribed under the Large Exposure Framework.

Trade Settlement:

- It refers to the transfer of securities and funds between buyers and sellers after a trade is executed.
- A trade settlement is said to be complete once purchased securities of a listed company are delivered to the buyer, and the seller gets the money.
- **Trade Settlement Period**: It refers to the **interval of time between the trade date on which an order is executed in the market and the settlement date on which a trade is deemed final.**
- **T+1 Trade Settlement**: It means trade-related settlements happen within a day, or within 24 hours of the actual transaction.
- Under the T+1 settlement cycle, if an investor sells securities, the money gets credited into her account the following day.
- Status of India: India became the **second country** to start the T+1 settlement cycle in top listed securities after China, bringing operational efficiency, faster fund remittances, share delivery, and ease for stock market participants.
- **T+2 Trade Settlement**: In this, Indian stock exchanges are settled in two working days after the transaction is done (T+2).
- **T+0 Trade Settlement**: This would mean settlements on the same day **(within an hour)** and instant settlement would ensure trades are settled immediately.

Definition:

- **Custodian Bank**: It is a financial institution that holds customers' securities for safekeeping to prevent them from being stolen or lost. The custodian may hold stocks, bonds, or other assets in electronic or physical form on behalf of its customers.
- **Irrevocable Payment Commitments (IPCs)**: IPC are defined as an obligation on the part of credit institutions to pay their contributions in the future through a contract signed between the financial arrangement and an institution that opts for the IPC.

Indian stock market has been witnessing volatility amid the ongoing Lok Sabha elections and swing trading has been trending on the internet.

Swing Trading:

- It is a style of trading where investors keep their positions for longer than a single day, typically **holding onto stocks for several days** or weeks.
- The goal of swing trading is to capture gains in a **stock"s value as it swings up and down.**
- A swing trader will look for stocks with **high volume (a lot of trading activity)** and volatility (price movement).
- The entry into a swing trade involves setting up stop-loss orders (to limit potential losses) and target prices (to capture profits) based on support and resistance levels.
- Swing traders buy at support (lower price level) and sell at resistance (higher price level) anticipating the stock"s price to swing back and forth within these bounds.

What"s the objective of swing trading?

- The primary goal of swing trading is to profit from short- to medium-term fluctuations in stock prices.
- Traders aim to enter and exit positions quickly, typically holding stocks for 2 days to a few weeks.

- Swing traders capitalise on both upward and downward movements in the market, seeking to take advantage of trends and momentum.
- Swing trading offers flexibility and can be less time-consuming compared to day trading. Traders can benefit from short- to medium-term gains and adjust their positions swiftly based on market conditions.

The government's Department of Pension & Pensioners" Welfare recently started the Integrated Pensioners' Portal in collaboration with Bank of India.

Integrated Pensioners' Portal:

- The portal is specifically designed to ensure complete digitization of the pension processing and payment system.
- It combines the pension processing and payment services of five **banks (Bank of India, State Bank of India, Bank of Baroda, Punjab National Bank, and Canara Bank)** into a single window.
- Most pension-disbursing banks will be integrated with the portal later.
- Its primary objective is to achieve **transparency and efficiency** in pension-related services.
- With this system, the pensioner"s personal and service particulars can be captured, which enables the online submission of pension forms.
- Retirees will also be notified of the progress of their pension sanction through SMS or e-mail, keeping them informed throughout the process.
- A major feature of the IPP is that retirees can access their monthly pension slips, check the status of life certificates, submit Form 16, and view statements of arrears paid.
- The portal has a **Bhavishya platform** and a **Centralised Pension Grievances Redress and Monitoring System (CPENGRAMS)**.

Bhavishya platform:

- It is an online **Pension Sanction & Payment Tracking System** launched by the **Department of Pension & Pensioners' Welfare**.
- It provides online tracking of pension sanction and payment process by the individual as well as the administrative authorities for all actions preparatory to grant pension and other retirement benefits, as well as payment of monthly pension after retirement.
- The system captures the pensioners personal and service particulars.
- The forms for processing pensions can be submitted online.
- It keeps retiring employees informed of the progress of the pension sanction process through SMS/ Email. The system obviates delays in the payment of pensions by ensuring complete transparency and establishing accountability in the pension sanction and payment process.
- The system obviates delays in the payment of pensions by ensuring complete transparency.

CPENGRAMS:

- CPENGRAMS is an online **web-enabled system** for **speedy redressal** of grievances related to pension by various **Central Government Ministries/ Departments/Organizations.**
- This system, besides providing a faster access to pensioners, offers the following online facilities:
  1. Registration of pension grievances online
  2. Forwarding of reminders on line
  3. Query on the status of any of the registered grievances

4. Available (24*7) basis for submission of grievance online
5. It has been developed with the objective of speedy redress and effective monitoring of the grievances besides providing fast access to pensioners.
6. Pensioners can also appeal if they are not satisfied with the redressal of their grievance.

NPCI issues guidelines for merchant acquisition on BHIM Aadhar Pay

- The National Payments Corporation of India (NPCI), in a circular, has issued guidelines that put the onus of verifying merchant details on acquiring banks for BHIM Aadhar Pay.

BHIM Aadhar Pay:

- BHIM Aadhaar Pay enables Merchants to receive digital payments from customers **over the counter** through Aadhaar Authentication.
- It allows for any Merchant associated with any acquiring bank live on BHIM Aadhaar Pay, to accept payment from customers of any bank by **authenticating customer's biometrics.**

Prerequisite :

- To be able to effect the same, merchants should have an Android mobile or any supported device with BHIM Aadhaar Pay app and certified biometric scanner attached with mobile phone/Kiosk/Tablet on USB Port or Micro-ATM/POS, mPOS.
- Both Customer and Merchant should have their Aadhaar linked to their Bank Account.

Reference Guidelines for Merchant Acquisition Standards- BHIM Aadhaar Pay:

The NPCI issued these guidelines to an acquiring member bank's key responsibilities and accountabilities when managing merchants.

An Acquiring Member Bank must monitor its Merchant activity (viz., on-boarding criteria, transaction monitoring & control, training, assessment of the portfolio metrics, etc.) periodically.

These monitoring standards for merchants is a baseline for the level of oversight on Merchant performance.

Acquiring Member Banks can use both manual as well as digital modes of merchant due diligence.

Acquiring Member Bank should ensure the following points are in place and the same is adequately addressed:

1.Board approved policy for Merchant acquisition:

- Implement policies that include standards to ensure quality / business conduct to mitigate risk to the NPCI operated payment system in terms of financial or reputational risk.
- The policies must be approved by the Acquiring Merber Bank's Board of Directors and should have a periodic review mechanism.

2.Agreements with various stakeholders (as appropriate) : Merchant agreement in place with each merchant/ aggregator (as appropriate) before any service is provided.

3.Merchant underwriting : It has advised members to assign appropriate **Merchant Category Code (MCC)** while taking on board merchants.

4.Merchant portfolio and risk monitoring : They are required to ensure that cash withdrawal transactions are not allowed on the BAP service's merchants by categorizing **Merchant Criteria & Prohibited Merchants**.

5.Merchant training: Third party agent risk oversight and governance.

National Payments Corporation of India (NPCI):

- It is an umbrella organization for operating retail payments and settlement systems in India.
- It is an initiative of the **Reserve Bank of India (RBI) and Indian Banks' Association (IBA)** under the provisions of the **Payment and Settlement Systems Act, 2007**, for creating a robust Payment & Settlement Infrastructure in India.
- It has been incorporated as a **"Not for Profit" Company** under the provisions of **Section 25 of Companies Act 1956 (now Section 8 of Companies Act 2013),**
- **Objective** : with an intention to provide infrastructure to the entire Banking system in India for physical as well as electronic payment and settlement systems.
- **Focus**: To bring innovations in the retail payment systems through the use of technology for achieving greater efficiency in operations and widening the reach of payment systems.

The Labour and Employment Ministry has boarded the PM Gati Shakti portal to identify and bridge gaps in social security coverage across the country.

PM Gati Shakti:

- It was launched by the **Prime Minister in October 2021**.
- PM Gati Shakti is recognized as the **National Master Plan for Multimodal Connectivity**.

Purpose and Objectives of PM Gati Shakti:

- It **integrates 16 ministries**, including Railways and Roadways, to ensure cohesive infrastructure development.
- PM Gati Shakti aims for integrated planning and coordinated implementation to optimize infrastructure projects.
- It strives to **reduce logistics costs** from the current 13-14% of GDP to 7-8%, aligning with developed economies.
- PM Gati Shakti enhances the ease of doing business and boosts the global competitiveness of Indian products.
- It achieves multimodal connectivity to reduce travel times for both people and goods.

Key Features of PM Gati Shakti:

- **Digital Platform**: PM Gati Shakti includes a **centralized GIS-based portal** that allows for real-time monitoring of projects.
- **Holistic Planning**: It combines the efforts of various ministries to mitigate project delays and cost overruns.
- **Six Pillars**: PM Gati Shakti emphasizes comprehensiveness, prioritization, optimization, synchronization, analytical, and dynamic nature of planning and implementation.
- **Integration of Schemes**: It incorporates existing schemes like **Bharatmala, Sagarmala, and UDAN**, and develops economic zones including industrial and defence corridors, as well as textile clusters.
- *Implementation Mechanism of PM Gati Shakti:*
- **Network Planning Group (NPG)**: PM Gati Shakti includes representatives from key ministries for integrated project planning and streamlined approvals.
- **GIS-Based Tools**: It utilizes spatial planning tools and satellite imagery to enhance project monitoring and updates.
- **Inter-Ministerial Coordination**: PM Gati Shakti promotes synergy among different departments to minimize redundant work and optimize resource utilization.

Major Projects Under PM Gati Shakti:

- **Delhi-Mumbai Expressway**: Partially completed, it spans 1,386 km across multiple states.
- **Bengaluru-Chennai Corridor**: Currently under implementation, it extends 262 km.
- **Delhi-Amritsar-Katra Corridor**: Also under implementation, it covers 669 km.

India VIX Index

TheVolatility Index (VIX):

- The Volatility Index, also known as **VIX** or the **Fear Index**, quantifies the market"s anticipation of volatility over the short term.
- Defined as **the rate and magnitude of price changes**, the VIX serves as a measure of market risk or financial instability.
- This index reflects how much an underlying index is expected to fluctuate in the near term, expressed as **annualized volatility in percentage terms** (e.g., 20%).
- A rise in the VIX generally indicates **increased market volatility**, often seen with **steep market movements** either upwards or downwards. Conversely, a decline in the VIX suggests subsiding volatility.
- Initially based on the **S&P 100 Index** option prices in 1993, the methodology for the VIX was revised in 2003 to utilize S&P 500 Index options.
- The VIX was pioneered by the **Chicago Board of Options Exchange (CBOE)**, marking it as the first volatility index for the US markets.

India VIX:

- India VIX specifically measures the expected **market volatility** over the **next 30 calendar days** in India.
- It is computed by the **National Stock Exchange (NSE)** based on the **order book of NIFTY Options**, utilizing the best bid-ask quotes of near and next-month NIFTY options contracts traded on the F&O segment of NSE.

- Like its global counterpart, higher values of India VIX indicate greater expected volatility and lower values suggest less anticipated fluctuations.
- The index serves as a crucial indicator of investor sentiment regarding near-term market risk.
- India VIX is a licensed use of the "VIX" trademark by the CBOE, granted to NSE with permissions for application specifically to the Indian market context.

Airbus Helicopters and the Small Industries Development Bank of India (SIDBI) recently signed a Memorandum of Understanding (MoU) for financing the purchase of Airbus' helicopters in India.

Small Industries Development Bank of India (SIDBI):

- It was set up on 2nd April, **1990**, under an Act of the Indian Parliament.
- Purpose: To act as the principal financial institution for promotion, financing, and development of the Micro, Small and Medium Enterprise (MSME) sector, as well as for the co-ordination of functions of institutions engaged in similar activities.
- It is under the jurisdiction of the **Ministry of Finance, GoI.**
- It was incorporated in initially as a wholly owned subsidiary of the Industrial Development Bank of India (IDBI).
- Currently the shares of SIDBI are held by the Government of India (GoI) and 22 other institutions/PSBs/insurance companies owned or controlled by the Central Government.
- **Headquarters**: Lucknow, Uttar Pradesh
- SIDBI helps MSMEs in acquiring the funds they require to grow, market, develop, and commercialize their technologies and innovative products.
- The bank provides several schemes and also offers financial services and products to meet individual requirements of various businesses.
- Financial support to MSMEs is provided by way of
- Indirect/refinance to banks/Financial Institutions for onward lending to MSMEs

- Direct finance in niche are as like risk capital, sustainable finance, receivable financing, service sector financing, etc.
- SIDBI was made responsible for administering the Small Industries Development Fund and the **National Equity Fund** that were administered by IDBI before.
- In order to promote and develop the MSME sector, SIDBI adopts a **'Credit Plus'** approach, under which, besides credit, SIDBI supports enterprise development, skill upgradation, marketing support, cluster development, technology modernization, etc.

NFRA - National audit watchdog set to expand Inspection.

- India's leading eight auditors will be inspected this year, with the financial statements of up to 60 of their clients being scrutinized, as the **national audit watchdog** intensifies its efforts to improve audit quality across the country.

National Financial Reporting Authority (NFRA)

- *Establishing Authority:* The **Companies Act of 2013's Section 132** grants the Central Government the power to establish such an authority.
- **Institute of Chartered Accountants of India (ICAI):**
- The ICAI is the largest professional body of **Chartered Accountants** in the world, with a strong tradition of service to the Indian economy in public interest.
- *Statutory body:* It is established under the **Chartered Accountants Act, 1949** for the regulation and development of the profession of Chartered Accountants in the country.
- *Nodal Ministry:* **Ministry of Corporate Affairs**, Government of India.
- *Members:* The Council consists of 40 members of whom 32 are elected by the Chartered Accountants and the remaining 8 are nominated by the Central Government generally representing the **Comptroller and Auditor General of India,** Securities and Exchange Board of India, Ministry of Corporate Affairs, Ministry of Finance and other stakeholders.

- *Composition:* The Companies Act requires the NFRA to have a *chairperson who will be appointed by the Central Government* and a **maximum of 15 members**.

Function:

- *Ensuring Adherence to Audit Quality Standards:* It inspects audit firms to verify their adherence to audit quality standards set by the Companies Act and the Institute of Chartered Accountants of India (ICAI).
- *Key Areas Scrutinized:* These include the audit firm's compliance with independence norms, adherence to auditor disqualification provisions in the Companies Act, and the integrity of audit documentation.

NFRA Report:

- *Transparency Through Publication:* The reports are published to provide both the audit firm and the industry with insights into deficiencies in financial statement preparation and auditing practices.
- *Encouraging Corrective Action:* While not a disciplinary action, the regulator's report strongly encourages audit firms and their clients to address identified deficiencies.
- *Confidentiality and Detail:* The inspection reports do not disclose the auditor's business client but detail the issues found in their accounts and audit processes.

Recently, Maldives is set to introduce India's RuPay service.

RuPay:

- RuPay is the **first global card payment network** in India.
- It is a combination of "Rupee" and "Payment,"
- It was launched by the **National Payments Corporation of India (NPCI) in 2012**.
- **Objective**: Create a domestic, open, and multilateral payment system, fulfilling the Reserve Bank of India's (RBI) vision.
- It is widely accepted at ATMs, POS devices, and e-commerce websites throughout India.

- RuPay enables electronic payments across all Indian banks and financial institutions.

Reasons behind the Maldives' decision to adopt RuPay:

- **Strengthening Maldivian Rufiyaa (MVR)**: The Maldivian government aims to make their currency, the **Rufiyaa**, stronger by using less US dollars in transactions with Indian tourists.
- This might make their economy more stable and could improve exchange rates.
- **Boost Bilateral Trade of Maldives**: Facilitating rupee transactions could streamline payments between India and the Maldives, potentially encouraging more trade between the two countries.
- **Promote Tourism and economic linkages**: Easier rupee transactions could incentivize Indian tourists to spend more freely in the Maldives, benefiting the Maldivian tourism industry, a major source of income for the country.

List of countries that accept Rupay

Bhutan

Nepal

Mauritius

Singapore

UAE

Impact of India's Rupay service on Indian economy:

Positives

- **Income from Transaction Fees**: Indian banks that give out RuPay cards might earn money from fees when people use those cards in the Maldives, which helps banks make more money.
- **Growing RuPay Network**: More countries accepting RuPay means it's becoming a bigger deal globally.

- This could mean more people and shops start using it in India too, which might make transactions cheaper.
- **Opportunity for Indian Businesses**: With Indian tourists using RuPay in the Maldives, more people there might start using Indian websites or services that accept RuPay. This could create new markets for Indian businesses.

Negatives

- **Data Security Concerns**: Inadequate protection of RuPay transactions in the Maldives could lead to data breaches or fraud affecting Indian cardholders. Therefore, there is a need for strong security.
- **Uncertain Regulatory Environment**: Unclear or changing regulations in the Maldives could disrupt RuPay operations which could be an inconvenience for Indian tourists and businesses.
- **Dependence on Maldives Implementation**: The success of RuPay in the Maldives depends on Its effective implementation by Maldives
- Any delays or issues in the rollout could limit the benefits.

The WIPO Treaty on Intellectual Property, Genetic Resources, and Traditional Knowledge was adopted at a World Intellectual Property Organization (WIPO) Diplomatic Conference at its headquarters in Geneva, Switzerland.

Background of the WIPO Treaty on Intellectual Property and Genetic Resources:

- **History**: The diplomatic conference marked the final stage of the negotiations that began in 2021. The treaty is borne of a proposal by **Colombia in 1999**.
- This is the 27th treaty under WIPO and the first in the last 10 years.
- **First WIPO Treaty**: It is the first WIPO treaty to include provisions specifically for Indigenous Peoples and Local Communities.
- This is important because under current laws, while genetic resources themselves cannot be patented, inventions developed using them can be protected.

- Role of India in Treaty Negotiations: India played a critical role during these negotiations. India was the only country which prepared a detailed paper on the base text for treaty negotiations.

Significance of the WIPO TIP & Genetic Resources for India:

- **Rich Biodiversity and Traditional Knowledge**: The new WIPO treaty is important to India as the country holds **7-8 per cent of global biodiversity** and a rich repertoire of knowledge based on these genetic resources
- **Enhancing Protection**: Strengthens Legal Safeguards for India's Genetic Resources and Traditional Knowledge against Global Misuse.
- For example, the patent rights for **turmeric**, a tropical herb native to East India and widely used as a medicine and food ingredient, were awarded to the University of Mississippi Medical Center.
- Additionally, India has raised concerns over patents being awarded for Neem and Indian Basmati rice in the past.
- **Global Acknowledgment**: The treaty will incorporate India's **Traditional Knowledge into the International Intellectual Property Framework.**

Key Provisions regarding this WIPO Treaty and Associated Traditional Knowledge:

- **Disclosure Requirement**: It requires patent applicants to disclose the country of origin or source when their application involves genetic resources.
- **Disclosure of Traditional Knowledge Providers**: If traditional knowledge linked to genetic resources is involved, the applicant must identify the Indigenous Peoples or local community that provided it.
- **Genetic Resources in Patents**: Genetic resources, present in entities like medicinal plants and agricultural crops, are frequently used in patented inventions, even though the resources themselves cannot be patented.
- **Establishment of Legal Framework**: Once 15 contracting parties have ratified it, the Treaty will establish an international legal framework.

- This framework will require patent applicants to disclose the origin of genetic resources and associated traditional knowledge used in their inventions.

World Intellectual Property Organization (WIPO):

- World Intellectual Property Organization (WIPO) is a **United Nations** specialized agency located in **Geneva, Switzerland**, set up by the **WIPO Convention in 1967**.
- **Aim:** Its goal is to guide the creation of an international intellectual property (IP) system that promotes innovation and creativity for everyone's benefit.
- WIPO Membership and Observers: WIPO has 193 member states
- **Palestine has permanent observer status.**
- WIPO meetings also include 281 NGOs, 47 IGOs, 17 UN system organizations, and 10 IP organizations as official observers.
- **India joined WIPO in 1975.**
- **Functions**: It serves as a worldwide policy platform where governments, intergovernmental organizations, industry groups, and civil society convene to tackle emerging IP issues.
- **Organizational Structure**: Member states and observers convene regularly in various standing committees and working groups.
- Within these forums, they negotiate adjustments and new regulations essential for keeping the international IP system aligned with a changing world.
- This ensures that the system remains dedicated to fostering innovation and creativity.
- **Publications**: The Global Innovation Index, compiled by INSEAD, Cornell University, and the World Intellectual Property Organization (WIPO), in addition to other institutions, evaluates countries' innovation capacity and success.

WIPO-Administered Treaties:

1.Budapest Treaty

- All states party to the Treaty are obliged to recognize microorganisms deposited as a part of the patent procedure, irrespective of where the depository authority is located.
- India has **ratified** the treaty.

2.WIPO Performances and Phonograms Treaty

- The WIPO Performances and Phonograms Treaty (WPPT) addresses the rights of two main groups in the digital realm:
- Performers (such as actors, singers, musicians, etc.) and
- Producers of phonograms (individuals or entities responsible for recording sounds).
- India has become a party to this agreement.

3.Madrid Protocol for the International Registration of Marks

- It Allows for the global registration of trademarks through a single application that can encompass multiple countries.
- India has become a party to the protocol.

4.WIPO Copyright Treaty

- It is a special agreement under the **Berne Convention** which deals with the protection of works and the rights of their authors in the digital environment.
- India has **ratified** the treaty.

Recently Meme Coins are Garnering considerable popularity within the cryptocurrency realm.

- The term "meme coin" originated with **Dogecoin**, conceived as a playful response to the Doge meme featuring a **Shiba Inu dog**.
- *Memecoins:*
- Meme coins, also known as **'memetic tokens' or 'community coins'**, are **digital currencies** created as a form of satire or humorous tribute to the internet culture.

- They often feature quirky names, logos, and branding that reference popular memes, jokes, or internet phenomena.
- Presently, the market boasts over 300 different meme coins.
- For Example: **Dogecoin (DOGE), Shiba Inu (SHIB), Retik Finance (RETIK).**

Working of Meme Coins:

- Meme coins function similarly to traditional cryptocurrencies, **leveraging blockchain technology** to operate.
- They are commonly established on platforms like **Ethereum and Solana**, which facilitate their functionalities.

Advantages and disadvantages of Meme Coins:

Pros:

- **Highly Volatility**: Possibility of earning a profit if values rise
- **Extensive or uncapped supply**: Minimal values per token due to extensive supply.
- **Exploring Blockchain Technology**: An Engaging Approach to Understanding Cryptocurrency, Smart Contracts, and Platforms such as Ethereum and Solana.
- **Straightforward creation process**: Comparatively straightforward creation process when juxtaposed with traditional cryptocurrencies.
- **Increase participation in Trading**: Potential participation in an active investing and trading community

Cons:

- **Lacks intrinsic value or unique utility**: These coins are primarily driven by speculation and community engagement.
- **High risk and volatility**: Due to rapid price fluctuations it poses risks of High Volatility.
- **Lack of Regulation**: As it operates within a largely unregulated environment, heightening susceptibility to fraud and manipulation.
- **Limited adoption**: Compared to leading cryptocurrencies, thereby restricting practical applicability.

- Technologically complex for some users

As per official data, India has recorded a trade deficit with 9 of its top 10 trading partners in 2023-24.

- India's FY 2023-24 Trade Deficit Narrows Amid Shifts in Trade Dynamics with Major Partners
- **Trade Deficit**: India's total trade deficit in FY 2023-24 narrowed down to **$ 238.3 billion** as against $ 264.9 billion in the previous fiscal.
- **Increase in Deficit**: India saw a rise in the deficit **with China ($ 85 billion), Russia ($ 57.2 billion), Korea ($ 14.71 billion) and Hong Kong ($ 12.2 billion)** in FY 2023-24, compared to 2022-23
- **Reduction in deficit**: The trade gap with the **UAE, Saudi Arabia, Russia, Indonesia, and Iraq** narrowed.
- **Trade surplus**: India has a trade surplus of **$ 36.74 billion with the US** in 2023-24.
- India also records a surplus with other trade partners like the UK, Belgium, Italy, France and Bangladesh.
- **Largest Trading Partner**: **China has overtook the USA to emerge as India's largest trading partner with $ 118.4 billion of two-way commerce in 2023-24.**
- Washington was the top trading partner of New Delhi during 2021-22 and 2022-23.
- **Free trade agreement**: India has a free trade agreement with four of its top trading partners ie. **Singapore, the UAE, Korea and Indonesia** (as part of the Asian bloc).

Trade Deficit:

- A trade deficit also known as a negative **balance of trade (BOT)** occurs when a country's imports exceed its exports.
- The balance can be calculated on different categories of transactions ie, goods or merchandise, services, goods and services and also for international transactions ie. (current account, capital account, and financial account)

- Cutting trade deficit requires boosting exports, reducing unnecessary imports, developing domestic industries, and managing currency and debt levels effectively,

Advantages:

- **Boost consumption**: A trade deficit allows a country to consume more than it produces and in short run, can help nations to avoid shortages of goods and other economic problems.
- **Comparative Advantage**: It provides countries with comparative Advantage as the country can be more focused on its strength and resources rather than to worry about producing everything.

Concerns:

- **Depreciation of currency**: A rising trade deficit can cause the **country's currency to depreciate** because more foreign currency is needed to cover for imports. This depreciation makes imports more expensive, worsening the deficit.
- **More borrowing**: The country might need to borrow more from foreign lenders to cover the imports, increasing external debt leading to depleted foreign exchange reserves
- **Investment sentiments**: overall rising Trade deficit can signal economic instability to investors, leading to reduced foreign investment.
- **Dependency**: Bilateral trade deficit becomes a major issue when a country gets overtly reliant on the other for critical supplies
- **Example: India's dependency on China for critical rare earth minerals and Active Pharma Ingredients.**

Recently, the Reserve Bank of India (RBI) has launched three major initiatives – PRAVAAH portal, the retail direct mobile app and a fintech repository.

1.PRAVAAH Portal (Platform for Regulatory Application, VAlidation and AutHorisation):

- **PRAVAAH portal** is a secure and centralized web-based portal for any individual or entity to seek authorisation, license or regulatory approval on any reference made by it to the Reserve Bank.
- Features: On the portal, 60 application forms covering different regulatory and supervisory departments can be submitted online.
- On the portal, an entity can track/monitor the status as well as RBI can send a decision related to a specified application in a time bound manner.
- More application forms would be made available as may be required.

Need of PRAVAAH Portal:

- **Regulatory Requirements**: Different entities must obtain licenses or authorizations to conduct activities regulated by the RBI.
- Additionally, regulated entities need to periodically seek specific regulatory approvals from the RBI under various statutes and regulations.
- Presently, the application and approval processes occur through a combination of online and offline methods.
- **Streamlining Financial Sector Compliance**: The 2023-24 Union Budget has emphasized the necessity to streamline, simplify, and minimize the cost of compliance for financial sector regulators.
- This includes establishing defined timeframes for processing applications under various regulations.
- **Role of PRAVAAH**: 'PRAVAAH' will eventually cover all kinds of applications submitted to the RBI across its functions.

2.Retail Direct mobile app:

- The retail direct mobile app will provide retail investors a seamless and convenient access to the retail direct platform and provide ease of **transacting in government securities (G-Secs).**

- **Launching of Retail Direct Portal**: In November 2021, the **Retail Direct Scheme** was launched, granting individual investors the opportunity to hold gilt accounts with the RBI and engage in government securities investment.
- **A Gilt Account** functions similarly to a bank account, with the distinction that it is debited or credited with **treasury bills or government securities** rather than currency.
- **Advantage of the App**: With the launch of the retail direct mobile app, retail investors can now transact in G-Secs using the mobile app on their smartphones.
- **Features of the App**: Through this application, investors can purchase both central and state government bonds, along with Treasury bills.
- It facilitates buying securities in primary auctions and executing buy/sell orders through the Negotiated Dealing System-Order Matching system (NDS-OM) platform.

Benefits of Retail Direct Scheme:

- **Direct Access**: Within the scheme, small investors have the opportunity to directly purchase or sell government securities (G-Secs), or bonds, without the need for an intermediary such as a mutual fund.
- **Zero Default Risk**: With the government as the borrower, there's a sovereign guarantee for the funds, ensuring zero risk of default.
- **Interest Rate Advantage**: Additionally, government securities may provide more attractive interest rates compared to bank fixed deposits, contingent upon prevailing interest rate trends.

3.FinTech Repository

- The FinTech Repository aims to capture essential information about FinTech entities, their activities, technology uses, etc.

- **Fintech:**Fintech, a combination of the terms "financial" and "technology," refers to **businesses that use technology to enhance** or automate financial services and processes.
- FinTechs, both regulated and unregulated, are encouraged to contribute to the repository.
- **Management of the Repository**: The FinTech Repositories are secure web-based applications and are managed by the **Reserve Bank Innovation Hub (RBIH)**, a wholly owned subsidiary of RBI.
- **Functions**: The repository would enable availability of aggregate sectoral level data, trends, analytics, etc that would be useful for both policymakers and participating industry members.
- ***EmTech Repositories:***A related repository for only RBI regulated entities (banks and NBFCs) on their adoption of emerging technologies (like AI, ML, Cloud Computing, DLT, Quantum, etc.), called EmTech Repository, is also being launched.
- **Ownership**: EmTech Repositories are secure web-based applications and are managed by the Reserve Bank Innovation Hub (RBIH), a wholly owned subsidiary of RBI.

The International Labour Organization (ILO) has released the Asia-Pacific Employment and Social Outlook 2024, highlighting the region''s recovery from the global pandemic and the challenges posed by a rapidly ageing population.

Key Highlights:

1. **Unemployment Rate:**

- Projected to remain at **4.2% in 2024** and 2025.
- This equates to **87.8 million** people out of work in 2024.

- Unemployment rates vary significantly across subregions and countries.
- The region"s jobs gap in 2023 was 164 million, including individuals unable to work due to care obligations.

2. **Working Poverty and Informality:**

- Persistent issues with low-quality, informal employment.
- Two in three workers were in informal employment in 2023, a slight improvement over the past decade.

3.Demographic Challenges:

- The ratio of people aged 65 and above is expected to double by 2050.
- This will increase the economic dependency ratio and pose challenges to sustaining economic growth.
- East Asia will experience a **demographic drag on growth of 0.3 percentage** points per year.
- South Asia will see a significant **decline in its demographic dividend**.

Opportunities and Policy Needs:

- **Income Growth and Productivity:**
- Potential for continued income growth per capita if productivity growth is maintained.
- Labour productivity in emerging economies is less than a third of that in high-income countries, indicating significant potential for improvement.
- Structural barriers and lack of training opportunities need to be addressed.
- **Policy Reforms:**

- Necessary to reduce inequalities and improve labour market prospects for older workers.
- Equitable pension systems are needed to manage demographic changes.

Registrations by Indian companies for external commercial borrowings (ECBs) almost doubled to $49.2 billion in the financial year 2023-24 (FY24) from $26.6 billion in FY23, according to data from the RBI.

External Commercial Borrowings (ECBs):

- ECBs refer to the borrowing of funds by Indian companies **from foreign sources in the form of loans, bonds, or other financial instruments.**
- **Purpose**: It can be used to finance a variety of purposes, including the expansion of business, the acquisition of assets, and the repayment of existing debt.
- **Source of ECBs**: ECBs can be obtained from a variety of sources, including foreign banks**, international financial institutions**, and **foreign subsidiaries of Indian companies.**
- ECB can be in the form of **rupee-denominated loans**, which are repaid in Indian rupees, or foreign currency-denominated loans, which are repaid in a foreign currency.
- **Regulation**: ECB is subject to regulatory oversight by the RBI, which sets limits on the amount of ECB that Indian companies can obtain and the purposes for which it can be used.
- The ECBs fall under the umbrella of **RBI regulations** as postulated under the **Master Direction** - External Commercial Borrowings, Trade Credits, and Structured Obligations (Master Direction), and the **Foreign Exchange Management Act, 1999 (FEMA).**

- ECBs should adhere to criteria like minimum maturity period, maximum all-in-cost ceiling, permitted and non-permitted end-uses, etc.
- As of today, there are two paths to raise funds by employing ECBs: the **approval route** and the **automatic route**.
- There are a variety of eligibility regulations created by the government for availing of finance under the automatic route.
- These regulations are in relation to amounts, industry, the end-use of the funds, etc. Companies that desire to raise finance via ECB must necessarily meet these eligibility criteria; thereafter, funds can be raised without the need for approval.
- The approval route, on the other hand, mandates that companies which fall under certain pre-specified sectors must obtain the RBI"s or the government"s explicit permission, prior to raising funds through ECB.
- As per RBI guidelines, all entities except a **Limited Liability Partnership** are allowed to raise ECBs.

Benefits:

- ECBs provide an opportunity to borrow large volumes of funds.
- The funds are available for a relatively long term.
- Interest rates are also lower compared to domestic funds.
- ECBs are in the form of foreign currencies. Hence, they enable the corporate to have foreign currency to meet the import of machineries etc.

Risks:

- **Exchange rate risk**: Fluctuations in the value of the Indian rupee against foreign currencies can affect the cost of repaying the loan.
- **Sovereign risk**: The ability of a foreign government to repay its debt can affect the creditworthiness of foreign lenders.
- **Credit risk**: Foreign lenders may not have the same level of protection as domestic lenders in the event of default.

- **Regulatory risk**: Changes to government regulations or policies related to the ECB can affect the availability and cost of borrowing.

The Reserve Bank of India (RBI) recently issued the Framework for Recognising Self-Regulatory Organisation for the FinTech Sector (SRO-FT) for better self-governance and compliance by firms in this space.

SRO-FT Framework:

- The framework defines **fintech** as entities **providing technological solutions for delivery of financial products and services to businesses and consumers** or encompassing regulatory and supervisory compliance in partnership with traditional financial institutions or otherwise.
- The SRO-FT would be industry-led and will be responsible for establishing and enforcing regulatory standards, promoting ethical conduct, ensuring market integrity, resolving disputes, and fostering transparency and accountability among its members.
- The applicant should be set up as a not-for-profit company, and its shareholding should be sufficiently diversified, with no entity holding 10% or more of its paid-up share capital, either singly or acting in concert.
- Applicants will need to have a **minimum net worth of ₹2 crore within one year after recognition as an SRO-FT** or before commencement of operations, whichever is earlier.
- At least one-third of members on the board, including the chairperson, should be independent and without any active association with a fintech entity.
- Further, the majority of non-independent directors are to be representatives of FinTechs that are currently not directly regulated.
- Applicants should demonstrate the capability of establishing the necessary infrastructure to act as an SRO-FT effectively and consistently.

- It will also need to put in place systems for managing 'user harm' instances, which may include fraud, mis-selling, unfair practices, unauthorised transactions, or any other form of misconduct.
- While the **SRO can't open branches** or offices outside India, **FinTechs domiciled outside India can become members of an SRO.**
- The number of SRO-FTs to be recognised would depend on the number and nature of the applicants received, and the RBI reserves the right not to grant recognition to any such application.
- If deemed necessary, RBI can nominate or depute observers on the SRO-FT"s board.

Responsibilities:

- An SRO-FT should operate objectively under the oversight of RBI, and strive towards healthy and sustainable development of the sector.
- A fintech SRO should frame a code of conduct for members, set industry benchmarks and baseline technology standards for transparency, disclosure, and data privacy, set standardised documents for specific requirements, set up a mechanism for accreditation in the fintech ecosystem, and a code of conduct for responsible advertisements and market standards.
- The SRO-FT should have adequate powers to investigate and take disciplinary action against its members for non-adherence to codes / standards / rules.
- Responsibilities towards RBI would include **relaying sector-specific insights**, **addressing regulatory concerns**, collaborate on development of the sector, **foster co-operation**, provide policy commensurate to the dynamic nature of the sector, act as the collective voice of its members, provide regular updates on sector developments, and collect and share relevant data.

ENVIRONMENT

Scientists recently observed a wild male orangutan repeatedly rubbing chewed-up leaves of a medicinal plant on a facial wound in a forest reserve in Indonesia.

- It's the first known observation of a wild animal using a plant to treat a wound, and adds to evidence that humans are not alone in using plants for medicinal purposes.

Orangutans:

- Known for their distinctive red fur, Orangutans are the largest **arboreal** (animals that live in trees) **mammals**.
- They spend more than **90 percent** of their waking hours in the trees.
- Distribution: They live on the **Indonesian island of Sumatra** and on both the Malaysian and Indonesian portions of the **island of Borneo**.
- Habitat: Habitats range from **peat swamp forests** near sea level to mountainous forests almost a mile (1.6 kilometers) above sea level.
- There are three species of Orangutans-**the Bornean, Sumatran, and Tapanuli**.
- They are one of humankind's closest relatives. These great apes share 96.4% of our genes and are highly intelligent creatures.

Features:

- The adult male is typically twice the size of the female and may attain a height of 1.3 metres (4.3 feet) and a weight of 130 kg (285 pounds) in the wild.
- They have long, sparse orange or reddish hair unequally distributed over their bodies.
- They are very well adapted to life in the trees, with arms much longer than their legs. They have grasping hands and feet with long curved fingers and toes.

- Older males develop wide cheek pads, a unique feature among primates.
- **Lifespan**: Up to **50 years** in the wild.
- **Diet**: Daytime eaters, their diet consists mostly of fruit and leaves, but they also eat nuts, bark, insects, and, once in a while, bird eggs, too.
- **Social Structure**: Orangutans live semi-solitary lives in the wild. While they are the most solitary of the great apes, they exhibit social tolerance during times of high fruit abundance when they come together in aggregations known as parties.
- **Conservation status**: All three species are classified as **'Critically Endangered'** under the IUCN Red List.

European Parliament and the European Council reached to provisional agreement to establish the first EU-level Carbon Removal Certification Framework.

- Aim: To enhance carbon removal technologies and carbon farming by setting quality criteria standards.
- Includes monitoring and reporting processes to prevent greenwashing.

Carbon Farming:

- Carbon farming involves implementing **regenerative agricultural practices** that aim to restore ecosystem health, improve agricultural productivity and soil health, and mitigate climate change.
- It **integrates carbon sequestration** into the management of agricultural landscapes and **reduces** greenhouse gas emissions.
- This practice is adaptable across various agro-climatic zones.
- Common Forms of Carbon Farming: It **includes rotational grazing, agroforestry, conservation agriculture, integrated nutrient management, agro-ecology, livestock management, and land restoration.**

- **Optimal Conditions for Carbon Farming**: Regions with **long growing seasons**, **sufficient rainfall**, and substantial irrigation provide the best conditions to sequester carbon, through vegetation growth.
- In regions with adequate rainfall and fertile soil, the potential for carbon sequestration through practices like agroforestry (integrating trees and shrubs with crops) and conservation agriculture (minimising soil disturbance) may be particularly high.

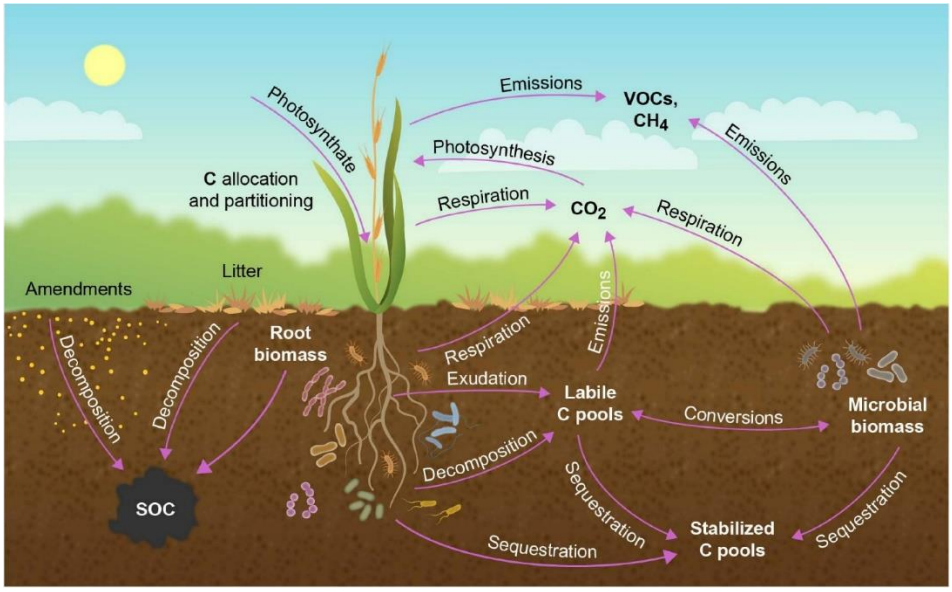
Advantages of Carbon Farming:

- **Diversification of Farm Income**: Agroforestry practices including silvopasture and alley cropping can diversify farm income by sequestering carbon in trees and shrubs.
- **Enhancement of Soil Health**: Conservation agriculture can help minimize soil disturbance and enhance organic content, particularly in places with other intense agricultural activities.
- Conservation agriculture techniques include zero tillage, crop rotation, cover cropping, and crop residue management (stubble retention and composting)
- **Promoting Soil Fertility**: Integrated nutrient management practices promote soil fertility and reduce emissions by using organic fertilizers and compost.
- **Ecosystem Resilience**: Agro-ecological approaches such as crop diversification and intercropping have benefits for ecosystem resilience.
- **Reducing Methane Emissions**: Livestock management strategies including rotational grazing, optimising feed quality, and managing animal waste can reduce methane emissions and increase the amount of carbon stored away in pasture lands.

Definitions:

- **Silvopasture**: It is the integration of trees and grazing livestock operations on the same land. These systems are intensively managed for both forest products and forage, providing both short- and long-term income sources.

- **Alley cropping**: It is defined as the planting of rows of trees and/or shrubs to create alleys within which agricultural or horticultural crops are produced.
- **Intercropping**: It is the practice of growing two or more crops in proximity.
- **Organic Farming**: In this type of farming, organic manure and natural pesticides are used instead of chemicals. No genetic modification is done to increase the yield of the crop.



Challenges to Carbon Farming

- **Limited water availability**: It can hinder the growth of plants, thus restricting the potential for sequestration through photosynthesis.
- For example, practices like cover cropping, which require additional vegetation between main crop cycles, may not be viable due to the added water demand.
- Carbon farming can be challenging in hot and dry areas where the availability of water is limited, and prioritized for drinking and washing needs.
- **Carbon Sequestration**: It is a climate change mitigation technology where CO2 is captured from power plants and other industrial processes instead of being emitted to the atmosphere.

- The captured CO2 is then stored in the subsurface with the goal of keeping it out of the atmosphere indefinitely.
- **Plant Selection for Carbon Sequestration**: Selecting which plants to grow also becomes crucial because **not all species trap and store carbon** in the **same amounts** or in an equally effective manner.
- **Financial Constraints**: The adoption of carbon farming practices may require financial assistance for farmers to overcome the costs of implementing them.
- In India, small-scale farmers may lack the resources to invest in sustainable land management practices and environmental services.

India hosts 46th Antarctic Treaty Consultative Meeting and 26th Meeting of the Committee for Environmental Protection.

- India is scheduled to host the 46th Antarctic Treaty Consultative Meeting (ATCM 46) and the 26th Meeting of the Committee for Environmental Protection (CEP 26) from May 20 to 30 in Kochi, Kerala. Organized by the Ministry of Earth Sciences (MoES) through the National Centre for Polar and Ocean Research (NCPOR).

Antarctic Treaty Consultative Meeting:

- It is pivotal in the international community"s ongoing efforts to safeguard Antarctica"s fragile ecosystem and promote scientific research in the region.
- It is convened annually under the Antarctic Treaty System, these meetings serve as forums for **Antarctic Treaty Consultative Parties** and other stakeholders to address Antarctica"s pressing environmental, scientific, and governance issues.

What is the CEP?

- It was established under the **Protocol on Environmental Protection** to the Antarctic Treaty (the **Madrid Protocol**) in 1991.
- The CEP advises the ATCM on environmental protection and conservation in Antarctica.

Key facts on Antarctic Treaty:

- It was signed in **1959** and entered into force in **1961**.
- It established Antarctica as a region dedicated to peaceful purposes, scientific cooperation, and environmental protection. Over the years, the Treaty has garnered widespread support, with 56 countries currently party to it.

Provisions of the treaty

- Antarctica shall be used for peaceful purposes only
- Freedom of scientific investigation in Antarctica and cooperation toward that end… shall continue
- Scientific observations and results from Antarctica shall be exchanged and made freely available
- **India has been a Consultative Party** to the Antarctic Treaty since 1983.
- It participates in the decision-making process along with other 28 Consultative Parties to the Antarctic Treaty.
- India's first Antarctic research station, **Dakshin Gangotri**, was established in **1983**.
- At present, India operates **two year-round research stations**: ***Maitri (1989) and Bharati (2012).***
- The permanent research stations facilitate Indian Scientific Expeditions to Antarctica, which have been ongoing annually since 1981.
- In 2022, India enacted the **Antarctic Act**, reaffirming its commitment to the Antarctic Treaty.
- The **Antarctic Treaty Secretariat (ATS)** serves as the administrative hub for the Antarctic Treaty System.
- ATS was established in **2004** and coordinates the ATCM and CEP meetings, reposits and disseminates information, and facilitates diplomatic communication, exchanges, and negotiations related to Antarctic governance and management.

A new biocontrol agent to manage 'foot rot' disease in Basmati crop: Why this matters?

- Recently , The Punjab Agricultural University (PAU), Ludhiana, has developed biocontrol agent **"Trichoderma Asperellum"** to combat 'foot rot' disease in Basmati Varieties of Rice.

Foot Rot Disease:

It is also known as **Bakanae disease**.

Causative Agent: **'Fusarium verticillioides'**

It is a soil-seed borne pathogen which spreads the infection **through the root** of the plant, and eventually leads to the colonization of the stem base.

It **affects Basmati rice** crops particularly at the **seedling stage**, though it might also cause infection after transplantation in case infected seedlings are transplanted.

Symptoms : Infected seedlings first turn **pale yellow**, then elongate and dry up, and eventually (usually) die.

Preventive Management Strategies to Control Foot Rot Disease:

To prevent the disease from occurring and spreading, farmers resort to

1. Early seedling treatment,
2. Try to use disease-free seeds, and
3. Destroy infected seedlings.

Timely seed nursery management :

- Seed sowing in the **first fortnight** of June, and transplantation in July.
- Sowing in May often leads to problems as the month's high temperatures are favourable to the disease.
- **Well Drained Fields** : Fields where the nursery is being set up must also be well-drained, with proper irrigation, to avoid the spread of foot rot.

- Current Practices :
- Seedlings are treated with **'Trichoderma harzianum'** before sowing and transplantation.
- Seeds are also treated with fungicides such as **Sprint 75 WS** (**carbendazim + mancozeb**) before sowing.
- But these are the chemical treatments which are harmful for the soil, and can be toxic for consumers of the rice.

Importance of New Biocontrol Agent **'Trichoderma Asperellum':**

- It is an important development in rice farming techniques, bringing in a more sustainable strategy that will offer a non-chemical alternative to traditional pesticides.
- This transition ensures safer rice production, aligning with global standards for food safety.
- It will help in aiding in disease management while minimizing environmental harm.

Basmati Rice:

- Basmati rice is a **long-grain aromatic** rice known for its extra-long slender grains, fluffy texture, delightful taste, superior aroma, and distinct flavor.
- Varieties of Basmati Rice: Around 34 varieties recognized under the **Seeds Act, 1966.**
- Cultivation Areas: Only Permitted to cultivate **in J&K, Himachal Pradesh, Punjab, Haryana, Delhi, Uttarakhand, and western Uttar Pradesh.**
- It is a registered **GI (geographical indication) product**.
- Largest Producer & Export Leader: India is the top exporter, around **70% of global** production.

Constructed wetlands emerge as a promising approach, offering not only effective treatment but also environmental and economic benefits.

Constructed wetlands:

- These are engineered structures designed to replicate the functions of natural wetlands.
- They are composed of meticulously chosen vegetation, soil and water, orchestrated to facilitate a seamless process of purification.
- Constructed wetlands are typically divided into **two categories**:
- **Subsurface flow (SSF)**: These wetlands direct **wastewater through gravel beds** or porous media, promoting **microbial activity** that degrades organic matter.
- **Surface flow (SF)**: These wetlands demonstrate their aesthetic appeal above the water's surface, with gently flowing streams and lush vegetation.
- **Objective**: To convert pollutants into benign compounds through natural processes.
- Unlike conventional concrete tanks, these wetlands foster biodiversity, welcoming a diverse array of life forms — ranging from microorganisms to aquatic plants and even birds — to engage in the purification process.
- India boasts several remarkable locations where constructed wetlands are utilised for wastewater treatment.
- One such example is the **Asola Bhatti Wildlife Sanctuary in Delhi**, situated on the city's outskirts.
- The **Kolkata East Wetlands in West Bengal**, designated as a **Ramsar site**, feature a vast network of natural and constructed wetlands.

Benefits:

- **Cost-Effectiveness**: In contrast to traditional treatment facilities, constructed wetlands frequently offer a more economical option for construction and upkeep.
- **Environmental benefits**: In addition to their primary role in wastewater treatment, constructed wetlands offer supplementary environmental advantages. They function as habitats for a wide array of plant and animal species, promoting biodiversity conservation.
- **Scalability and adaptability**: Constructed wetlands are flexible in their scalability, able to be adjusted to fit various industrial operations and spatial limitations.

World's largest Direct Air Capture and Storage (DAC+S) plant in Iceland

- Swiss Company **Climeworks** has launched its second commercial **DAC+S facility**, larger than its predecessor Orca.
- CDR (Carbon Dioxide Removal):
- CDR is anthropogenic activities that remove CO2 from the atmosphere and securely store it in geological, terrestrial, or ocean reservoirs.
- Necessary to achieve **net-zero CO2** and **greenhouse gas emissions**, as highlighted in the IPCC Sixth Assessment Report.

- *Significances:*
- Carbon capture technologies are crucial for achieving near-zero CO2 emissions in power plants and industries.
- Aids the global transition to net-zero emissions by managing CO2 from both industrial processes and directly from the atmosphere.
- **Carbon Removal Efforts:**
- Direct Air Capture (DAC) and DAC+S technologies capture CO2 directly from the atmosphere, key for maintaining global temperatures within safe limits.
- Involves techniques like **Post Combustion Capture, Pre-Combustion Capture, and Oxy Fuel Combustion.**
- Other CDR methods include **Afforestation/Reforestation**, **Soil Carbon Sequestration**, **Enhanced Weathering**, Ocean-based CDR methods like **ocean fertilisation** and **ocean alkalinity enhancement**, and **Bioenergy with Carbon Capture and Storage (BECCS).**
- *Carbon Capture Plants in India:*
- Tata Steel's CO2 capture plant in **Jamshedpur**, a **first of its kind in India's steel industry.**
- Supported by initiatives like the Indian CO2 Sequestration Applied Research Network and inclusion in the National Action Plan on Climate Change.
- *Impact on the Climate:*
- Reduces CO2 emissions significantly from key industrial sources.
- Contributes to the mitigation of global warming and its environmental impacts.

A leopard cat has been spotted in Maharashtra's Pench Tiger Reserve for the first time.

Leopard Cat:

- It is a species of forest-dwelling cat, of the family Felidae.
- Scientific Name: **Prionailurus bengalensis**
- It is noted for its leopard-like colouring.

Distribution:

- They are the most widely distributed Asian small cats.
- Their range extends from **the Amur region in the Russian Far East** over the Korean Peninsula, China, Indochina, the Indian Subcontinent, to the West in northern Pakistan, and to the south in the Philippines and the **Sunda Islands** of Indonesia.

Habitat:

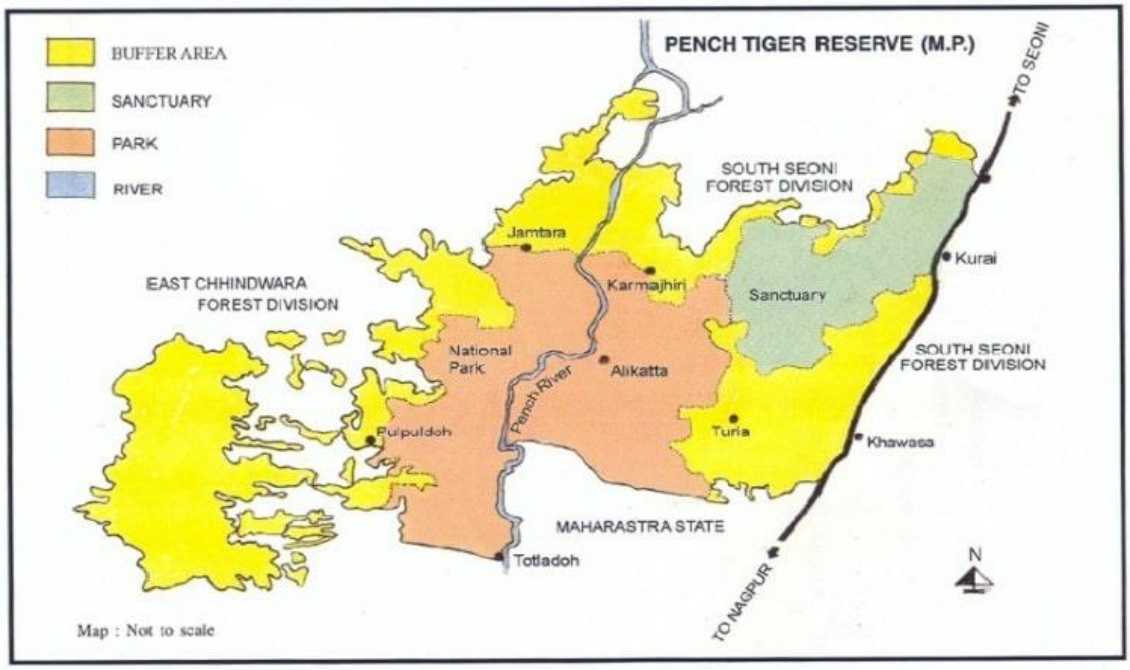
- They are found in agriculturally used areas but prefer forested habitats.
- They live in tropical evergreen rainforests and plantations at sea level, in subtropical deciduous and coniferous forests in the foothills of the **Himalayas at altitudes above 1000 m.**

Features:

- They vary widely in size and appearance across their range. The colouration ranges from pale tawny, to yellow, red, or grey above, with the underparts white, and spotted.
- There are usually four black stripes running down the forehead to the nape, breaking up into short bands and elongate spots on the shoulders.
- The length of the animal ranges from 45 to 75 cm (18 to 30 inches), excluding the 23–35-cm (9–13.8-inch) tail.
- They are solitary, nocturnal carnivores.
- **Conservation Status : IUCN Red List: Least Concern**

Pench Tiger Reserve:

- Location: It is located in the southern reaches of the **Satpura hills** in the Seoni and Chhindwara districts in Madhya Pradesh and continues in Nagpur district in Maharashtra as a separate Sanctuary.



- It is named after the **Pench River**, which flows from north to south through the Reserve.
- It comprises the Indira **Priyadarshini Pench National Park, the Pench Mowgli Sanctuary**, and a buffer.
- The area of the Pench Tiger Reserve and the surrounding area is the real story area of **Rudyard Kipling"s famous "The Jungle Book".**
- Vegetation: The undulating topography supports a mosaic of vegetation ranging from a moist, sheltered valley to an open, dry deciduous forest.
- Flora: The reserve boasts a diverse range of flora, including teak, saag, mahua, and various grasses and shrubs.
- Fauna:The area is especially famous for large herds of Chital, Sambar, Nilgai, Gaur (Indian Bison), and wild boar.
- The key predator is the tiger, followed by the leopard, wild dogs, and wolf.
- There are over 325 species of resident and migratory birds, including the Malabar Pied Hornbill, Indian Pitta, Osprey, Grey Headed Fishing Eagle, White Eyed Buzzard, etc.

The Injambakkam-Akkarai stretch development project has been recommended by the Tamil Nadu Coastal Zone Management Authority (TNSCZMA).

- The project aims to restoration and develop the beach stretch between Injambakkam and Akkarai in Chennai to achieve **Blue Flag certification.**

Blue Flag Certification:

- The Blue Flag Certification is an esteemed voluntary **eco-label awarded globally**.
- The certification honours beaches, marinas, and sustainable boating tourism operators.
- It is Administered by the **Foundation for Environment Education (FEE)**, based in Denmark.

- It aligns with stringent criteria covering water quality, environmental management, and safety.
- It underscores the commitment to environmental education.
- It supports the United Nations' Sustainable Development Goals (SDGs), promoting global sustainability.

Criteria for Blue Flag Certification:

To receive the Blue Flag, applicants must meet 33 specific criteria.

These criteria are divided into four main areas:

1. Environmental education and information
2. Bathing water quality
3. Environmental management
4. Safety and conservation services at the beaches

Historical Context and Expansion of Blue Flag:

- Launched in **1987**, initially within Europe, the Blue Flag program has expanded globally.
- As of now, it includes over 5,042 beaches, marinas, and sustainable tourist vessels.
- The program celebrated its 35th anniversary in 2022, marking over three decades of environmental advocacy.

Award Process for Blue Flag:

- A global jury comprising representatives from UNEP, UNWTO, IUCN, and FEE decides the awardees.
- The process emphasizes reconnecting the public with their natural environments through education.

- **Kadar tribesman's death in Tamil Nadu's Anamalai Tiger Reserve in an elephant attack has left the indigenous community in shock.**

- The recent death of a Kadar tribesman in Tamil Nadu's **Anamalai Tiger Reserve** in an elephant attack has left the indigenous community and conservationists in shock as Kadars are known to **co-exist** with wild elephants for ages.

Kadars:

- The Kadars are a small indigenous tribal community in South India.
- They reside along the hilly border between Cochin in Kerala and Coimbatore in Tamil Nadu.
- They are traditional forest dwellers who depend on forest produce for sustenance.
- They **do not** practice agriculture, building shelters thatched with leaves and shifting locations as their employment requires.
- They prefer to eat rice obtained in trade or as wages rather than to subsist on food of their own gathering.
- They have long served as specialized collectors of honey, wax, sago, cardamom, ginger, and umbrella sticks for trade with merchants from the plains.
- Kadar have a symbiotic relationship with nature, and they believe in the coexistence of Kadar and Kaadu (forest).
- The Kadar have traditional protocols to ensure the sustainable use of forest resources.
- Every practice of resource collection—be it honey, firewood, resin, or herbs—is designed to allow time for regeneration.

- Their population was estimated at approximately 2,000 individuals in the early 21st century.
- They speak the Dravidian languages of Tamil and Kannaḍa.
- They worship jungle spirits and their own kindly creator couple, as well as local forms of the Hindu deities.
- They are listed as a **Particularly Vulnerable Tribal Group (PVTG) in Kerala**, but not in Tamil Nadu.

Kanwar lake, Bihar's only Ramsar site, faces challenge of survival but not a poll issue.

Kanwar Lake:

- Also known as **Kabartal Wetland**, it is located in the **Begusarai district of Bihar**, India.
- It is recognized as **Asia's largest freshwater oxbow lake.**
- Formed by the meandering of **the Gandak River**, a tributary of the Ganga.
- Designated as Bihar's only Ramsar site in 2020 .

Biodiversity:

- The lake is a crucial habitat for a diverse range of flora and fauna.
- It supports over 50 fish species and provides a critical stopover for 58 migratory waterbirds along the **Central Asian Flyway.**
- Notably, it houses critically endangered species such as the **red-headed vulture, white-rumped vulture, Indian vulture, sociable lapwing**, and **Baer's pochard.**

Threats and Challenges:

- Major threats include water management issues like drainage, damming, and canalization, which impact the wetland's ecological balance.
- The area faces challenges from excessive chemical usage, encroachment, and illegal activities such as bird hunting and land encroachment by locals.

- Despite its Ramsar designation, there has been significant neglect, leading to its drying up and degradation, which also affects the local communities relying on its resources .

Conservation Efforts:

- The lake is protected under the **Wildlife Protection Act of 1972**, but enforcement has been lax, leading to continued ecological degradation.

Recently, The 26th meeting of the Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA-26) of the Convention on Biological Diversity (CBD) was held at Nairobi, Kenya.

Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA):

- It is an open-ended intergovernmental scientific advisory body providing the Conference of the Parties (COP) and its other subsidiary bodies, with timely advice relating to the implementation of the Convention.
- **Establishment**: It is formed by the **Article 25 of the Convention on Biological Diversity**
- **Functions**: To provide assessments of the status of biological diversity; providing assessments of the types of measures taken in accordance with the provisions of the Convention; and responding to questions that the COP may put to the body.
- The body recommended full implementation of the **The Biodiversity Plan**, which was adopted at **Montreal in December 2022.**
- The recommendations would be discussed upon further at the 16th meeting of the Conference of the **Parties (COP16).**
- COP16 will be held in the **Colombian city of Cali** from October 21-November 1, 2024.

- CBD's Subsidiary Body on Implementation (SBI): The delegates of the scientific Body will also become a part of the meeting of the CBD's Subsidiary Body on Implementation.
- **Main Focus**: Review of implementation, including updating of national biodiversity strategies and action plans; resource mobilization and financial mechanism; capacity building and development, technical and scientific cooperation, and knowledge management; cooperation with other conventions and international organizations.
- An expert group was also created to inform on the risks of living, modified fish.

Issues Discussed at the Meeting:

- Scientific and technical needs to support the implementation of the **Kunming-Montreal Global Biodiversity Framework**
- Monitoring framework for the Kunming-Montreal Global Biodiversity Framework: The work on monitoring Framework was advanced which would be used to track national, regional and global progress against the targets for 2030.
- **Detection and identification of living modified organisms**: The need for vigilance in detecting and identifying living modified organisms was re-emphasised with concerns being flagged about GM insect
- **Risk assessment and risk management** : New voluntary guidelines are recommended in the field of **biosafety and biotechnology** for risk assessment regarding engineered gene drives to strengthen transparency and scientific rigor of the process.
- **Synthetic biology**: Parties agreed on the need for capacity-building, technology transfer and knowledge-sharing to address the issue of equity in developing countries' participation in the field of Synthetic Biology, where traits are deliberately introduced in the genetic material of organisms.

- **Ecologically or biologically significant marine areas (EBSA)**: Setting the stage for a potential agreement to define EBSA and Conservation & sustainable use of marine and coastal biodiversity
- The decision is likely to be reached at COP16.
- **Biodiversity and Health**: It includes an updated version of the draft global action plan to mainstream biodiversity and health linkages into national policies.

The Kunming-Montreal Global Biodiversity Framework (GBF)

Convention on Biological Diversity

- **Adoption**: It was adopted during the fifteenth meeting of the Conference of the Parties (COP 15) 2022.
- **Aim**: The Framework sets an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050 with key elements being the 4 goals for 2050 and 23 targets for 2030.
- This Framework supports the achievement of the Sustainable Development Goals and builds on the Convention's previous Strategic Plans.
- **Mechanism for Implementation**: The Plan will include a monitoring framework for the GBF, an enhanced mechanism for planning, monitoring, reporting and reviewing implementation, the necessary financial resources for implementation, strategic frameworks for capacity development and technical and scientific cooperation, as well as an agreement on digital sequence information on genetic resources.
- **Global Stocktake**: At the COP16, There will be a global stocktake of the targets and commitments that have been set.

Census exercise begins in Himachal's cold desert Lahaul & Spiti district to estimate blue sheep, Himalayan ibex.

Himalayan Ibex:

- Subspecies of the **Siberian Ibex**, known for its sweeping, curved horns and agility on steep terrains.
- *Habitat:* Inhabit high-altitude regions, typically between **3,200 to 5,500 meters above sea level**, including **alpine meadows**, scree slopes, and cliffs.
- *Physical Characteristics:*
- Social animals living in herds.
- Males larger than females, with long, curved horns up to 130 cm in length.
- Coat is thick and coarse, varying from brown in summer to a darker, more insulated coat in winter for warmth.
- *Diet:* Herbivores grazing on grasses, herbs, and shrubs, adapted to limited food resources in their high-altitude habitats.
- *Distribution:* Found across the mountains of **India (states like Jammu and Kashmir, Himachal Pradesh), Pakistan, China, and Afghanistan.**

- **Conservation status:**
- Listed as **"Near Threatened"** on the **IUCN Red List**

- Protected under **Schedule I** of the **Wild Life Protection Act, 1972.**
- **Blue Sheep:**
- Also known as **Bharal,** a species of **caprid (goat-antelope)** native to the high Himalayas.

Physical Characteristics:

- Robust build, body length about 115 to 165 cm.
- Males possess distinctive backward-curving horns, up to 80 cm in length.
- Dense, woolly coat with a bluish-gray color that blends well with rocky surroundings.
- *Habitat:* Prefers steep, rugged terrains with sparse vegetation and rocky outcrops, ranging from 2,500 to 5,500 meters in elevation.
- *Diet:* Herbivores primarily grazing on grasses, herbs, and shrubs, adapting diet seasonally to availability.
- *Distribution:* Across high mountains of **Central and South Asia**, including parts of **China, India, Nepal, Bhutan, Myanmar, and Pakistan.**

Conservation status:

- Classified **as "Least Concern"** by the **IUCN** due to stable population and wide distribution;
- Also faces threats from habitat loss and human-wildlife conflict.

- Protected under **Schedule I of the WPA, 1972**.

Recently, a new study has shed light on the extent of microplastic pollution in Ashtamudi Lake, underscoring the need for continuous monitoring and addressing "potential public health concerns."

- The study Microplastic contamination in Ashtamudi Lake, India: Insights from a Ramsar wetland was done by the Department of Aquatic Biology and Fisheries, University of Kerala, with support from the Ecomarine Project co-funded by the **Erasmus programme** of the European Union.

Key Findings of the Study:

- **High Composition of Microplastics**: The highest percentage composition of microplastics was found in the **macrofauna**, with fish accounting for 19.6% and **shellfish 40.9%.**
- **Comprises:**
- **Fibers (35.6%),** fragments (33.3%) and films (28%) of the microplastics found in the collected samples.
- There is presence of plastic polymers as well as hazardous heavy metals.
- Polymer composition of microplastics includes **nylon, polyurethane, polypropylene, polyethylene, and polysiloxane.**
- Hazardous heavy metals such as **molybdenum, iron and barium**.
- **Source of Microplastics**: **Untreated municipal solid waste and plastic debris**, The inadequate management of plastic solid waste and **Fishing equipment**.
- **Raising Concerns**: The existence of plastic polymers and heavy metals in microplastic samples poses a threat to vulnerable biota; people consume contaminated fish and shellfish.

- **Actions Required**: There is a need of Development of strategies and action plans to gradually reduce the entry of microplastics into estuarine systems.
- *Microplastics:*
- **Size**: Microplastics are plastic fragments **less than five millimeters** in length.
- Formation: Microplastics are either manufactured (**microbeads** that are used in cosmetics and beauty products) or they are formed when larger pieces of plastic break down.
- Classifications: They are classified into following two types:
- **Primary Microplastics**: Tiny particles designed for commercial use and microfibers shed from clothing and other textiles.
- **Secondary Microplastics**: They are formed from the breakdown of larger plastics such as water bottles.

Initiatives Taken:

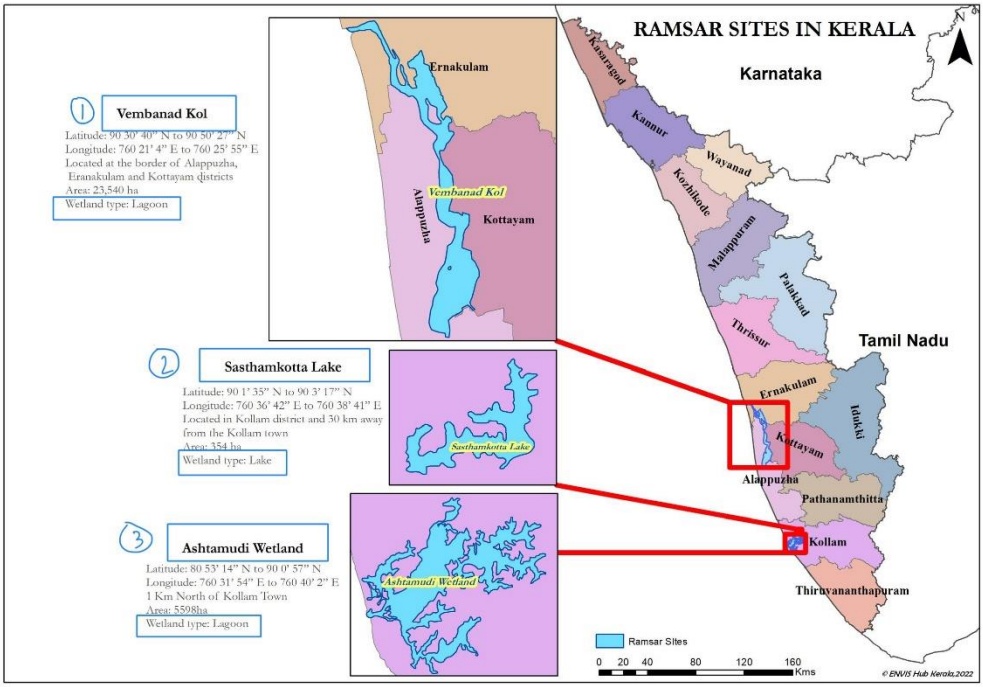
- **Global Initiatives:**
- **World Environment Day (WED) 2023**: It focuses on solutions to plastic pollution problem under the campaign #Beat Plastic Pollution.
- **Global Partnership on Marine Litter (GPML)**: It was launched at the Earth Summit in 2012 in response to the **Manila Declaration**.
- The Manila Declaration seeks to develop policies to reduce and control wastewater, marine litter and pollution from fertilizers.
- **GloLitter Partnerships Project**: Launched by the IMO and FAO, with an aim to prevent and reduce marine plastic litter from shipping and fisheries.
- **London Convention, 1972**: To control all sources of marine pollution and prevent pollution of the sea through regulation of dumping into the sea of waste materials.
- **Plastic Pacts**: To transform the plastics packaging value chain for all formats and products. *The first Plastics Pact was launched in the U.K. in 2018.*
- *India's Initiatives:*

- **Elimination of Single Use Plastic, 2019**: To eliminate all single-use plastic in the country by 2022, with an immediate ban in urban Delhi.
- **Plastic Waste Management Rules, 2016**: Every local body has to be responsible for setting up infrastructure for segregation, collection, processing, and disposal of plastic waste.

Ashtamudi Lake:

- It is a **backwater lake** and is also called the gateway to the backwaters of Kerala.
- Backwater is water turned back in its course by an obstruction on opposing current or the flow of tide in a river channel.
- Situated in: **Kollam District**, Kerala
- It is an extensive **estuarine system**, the second largest in Kerala State (after **Vembanad**).
- A Ramsar Site: The Ashtamudi wetland was designated a **Ramsar site in 2002**.
- Concerns: Population density and urban pressures pose threats to the site.
- **Importance**: Ashtamudi Kayal dates back to the times of the **Romans and Phoenicians** in the 14th century and was considered as one of the most important ports used for Chinese trade.
- **Associated Islands**: **Munroe island** (a group of eight small islands), **Chavara south (rich in minerals) and Thekkumbhagom island.**

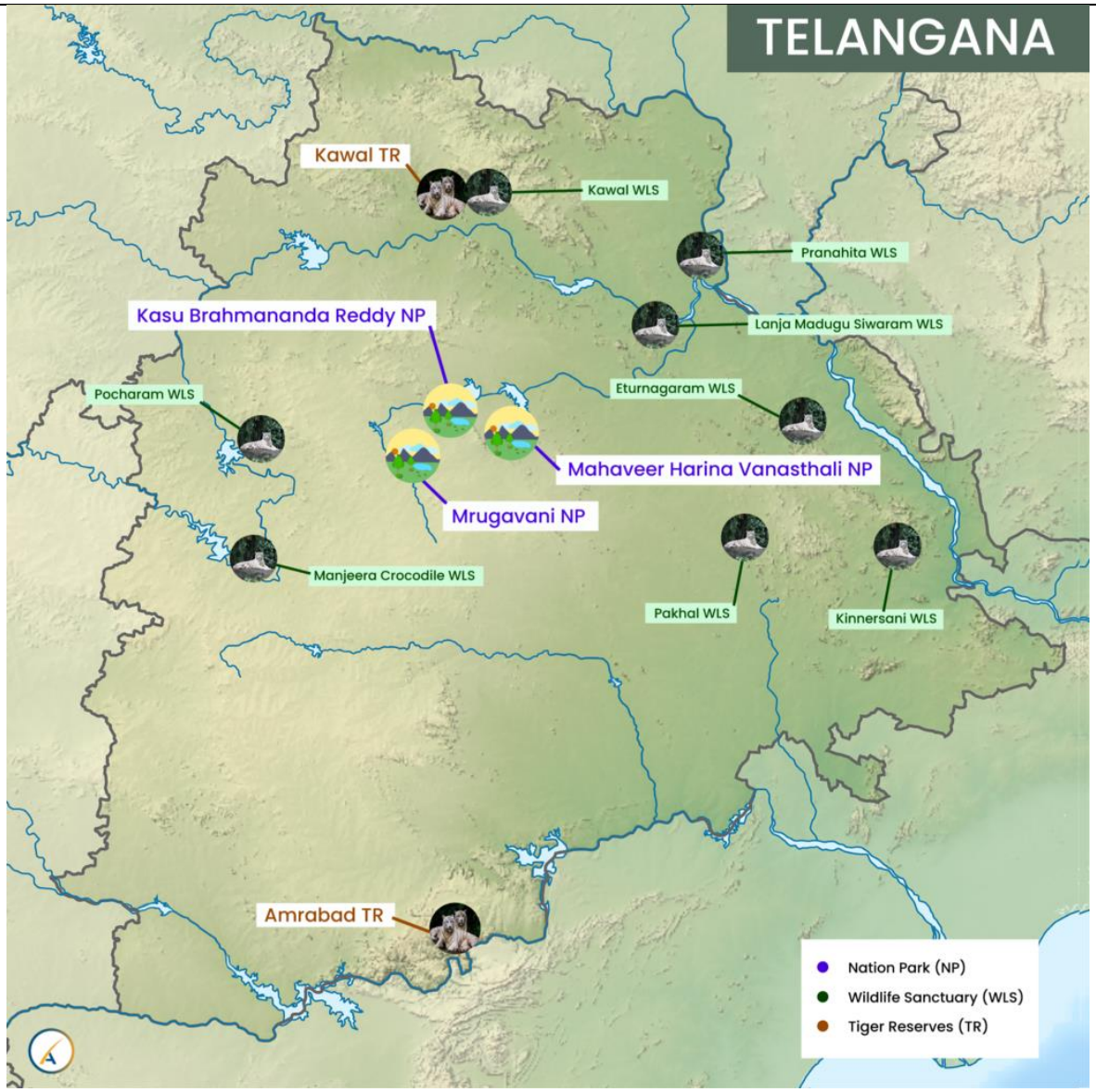
June 2024 – Current Affairs RajasirIAS.com



The National Green Tribunal (NGT) is addressing a case regarding high-tension electrical lines being laid through the eco-sensitive zone of Mrugavani National Park.

Mrugavani National Park:

- It is situated in Chilkur, Moinabad Mandal, **Hyderabad**, Telangana.
- It was declared a **National Park in 1994**.
- Area: The park covers an area of 3.6 square kilometers (1211 acres).



Vegetation:

- Characterized as tropical dry deciduous forest, it includes a variety of plant life forms such as **bryophytes, pteridophytes**, herbs, shrubs, climbers, and trees.
- The dominant flora includes **teak, bamboo, sandalwood, Picus, Palas, and Rela.**
- *Fauna:*

- It is home to diverse wildlife, hosting about 350 spotted deer, and other animals like Indian hare, forest cat, civet, Indian rat snake, **Russell's viper**, cheetal, wild boar, **jungle cat**, **mongoose**, monitor lizard, python, and king cobra.
- The park also supports over 100 bird species including warblers, peacocks, **lapwings,** and **flowerpeckers.**
- **Conservation Issues**: It was recently reported to NGT that the park"s area has been reduced by 80 hectares on paper, which impacts the integrity of its **eco-sensitive zone**.

Kerala Revises KFDC Order to Combat Invasive Species and Human-Wildlife Conflict.

- Recently, the Kerala government amended its earlier order of allowing the **Kerala Forest Development Corporation (KFDC)** to plant **eucalyptus trees** for its financial sustenance in 2024-2025 to limit permission to only cut exotic tree species from lands in the KFDC's control.
- **Issue with the Earlier Order**: In 2021, the Kerala government had published **an eco-restoration policy** that sought to address the "proliferation of invasive species that are not suitable for our environment" and the resulting "depletion of natural forests".
- **Harmful Impacts**: According to the policy, such depletion was in turn forcing wild animals to move to human-occupied land in search of food and thus increasing the prevalence of human-wildlife conflict.

Eucalyptus:

- It is a fast-growing **evergreen tree native to Australia**.
- **Use**: The eucalyptus tree oil is used as an **antiseptic, a perfume**, as a flavoring, in dental preparations and in industrial solvents.
- **Distinctive Trait**: It is adapted to grow in a wide range of climatic regimes or soil types and grows rapidly and establishes itself easily; etc.

Eco-Restoration:

- It is the process of **reclaiming habitat and ecosystem functions** by restoring the lands and waters on which plants and animals depend.
- **Aim**: It aims to initiate or accelerate ecosystem recovery by creating conditions for plants, animals and microorganisms to carry out the recovery process themselves.
- It is not a one-time activity and continues as the ecosystem recovers and matures.
- **Involves**: Restoration is a corrective step that **involves eliminating or modifying causes of ecological degradation and re-establishing the natural processes** like natural fires, floods, or predator-prey relationships that sustain and renew ecosystems over time.
- **Actions**: It may involve actions like removing invasive species, reintroducing lost species or functions, altering landforms, planting vegetation, changing hydrology and reintroducing wildlife.
- **Practices**: Reforestation and afforestation, wetlands restoration, river and stream restoration, peatland restoration, replanting mangroves and transplanting corals, etc.

India's Initiatives:

1. Sundarbans Mangrove Restoration
2. National Plan for Conservation of Aquatic Ecosystems (NPCA)
3. National Mission for a Green India (GIM)
4. Western Ghats Forest Landscape Restoration
5. Green Wall
6. National Afforestation Programme (NAP)
7. National Biodiversity Action Plan

Significance:

- **Biodiversity Conservation**: It helps to conserve biodiversity by providing species with the conditions they need to thrive.

- **Climate Change Mitigation**: It can sequester carbon dioxide from the atmosphere (such as forests, peatlands and mangroves), thereby helping to mitigate climate change.
- **Ecosystem Services**: Healthier ecosystems, with richer biodiversity, yield greater benefits such as more fertile soils, bigger yields of timber and fish, and larger stores of greenhouse gases.
- It can help us to achieve all of the **Sustainable Development Goals.**
- **Economic Benefits**: The economic benefits of such interventions exceed nine times the cost of investment, whereas inaction is at least three times more costly than ecorestoration.
- It can help in creating jobs like planting trees, managing protected areas and eco-tourism. Also, it can support local economies through improved agriculture, fisheries, and forestry.

Challenges:

- **Technical Challenges**: Selection of appropriate native species, determining the best methods for re-establishing those species and managing invasive species.
- **Funding**: These actions can be expensive and require sustained funding for over long periods as ecosystems can take years or even decades to recover fully.

Need To Do:

- **Social Considerations**: Any restoration action must consider the needs and rights of local communities, ensuring that restoration efforts also support local livelihoods.
- There is a need to ensure the involvement of local communities in planning and implementation.
- **Adequate Funding**: To attain success, there is a need to secure ongoing funding and gain political support.

- Monitoring: Careful monitoring, and evaluation to assess progress is the need of the hour.
- Time has come to ensure that restoration goals are met and that the ecosystem can sustain itself in the long term.
- **Restoration vs Conservation**: Restoration is not a substitute for conservation. While it can restore biodiversity, structure, and function to ecosystems, it should not be used to justify destruction or unsustainable use.
- It may not succeed in re-establishing the full assemblage of native species or the full extent of the original ecosystem's structure and function.

Recently, A New algal species "Oedocladium sahyadricum" discovered in the natural forests of Kumbhavurutty region of Western Ghats in Kollam.

Oedocladium Sahyadricum:

- The name '**sahyadricum'** refers to the **Western Ghats**, also known as Sahyadri.

Features:

- It is **Dioecious** (having the male and female reproductive organs in separate individuals.),
- Terrestrial, having a superior operculum (an operculum is a **flap of some type found on algae, fungi, or vascular plants**.).
- It looks like moss **protonema**, is velvety green but turns yellowish-green as it matures.
- Possessing **ellipsoid oogonium** (large cells that develop a pore in the cell wall that allows flagellated sperm cells to enter the cell.)
- **Oospore (a thick-walled sexual spore that develops from a fertilized oosphere).**

Habitat:

- The alga was found as a thin mat of elongated strands on damp soil.
- Rainy weather is likely needed for its abundant growth.
- *Potential practical applications:*
- In medicine, agriculture, and in the production of a natural pigment, **astaxanthin**.
- Algae play a significant role in ecosystems and have enormous economic importance in the world market, from high-value products to wastewater treatment.

Recently, a Himalayan serow was spotted in the central part of Nameri National Park and Tiger Reserve.

Himalayan serow: It resembles a cross between a goat, a donkey, a cow, and a pig.

Types:

- There are several species of serows, and all of them are found in Asia.
- The Himalayan serow, or **Capricornis sumatraensis thar**, is restricted to the Himalayan region. Taxonomically, it is a subspecies of the mainland serow (Capricornis sumatraensis).
- **Diet**: These are **herbivore species**.
- **Distribution**: These are typically found at altitudes between 2,000 metres and 4,000 metres (6,500 to 13,000 feet). They are known to be found in eastern, central, and western Himalayas, but not in the Trans Himalayan region.

Conservation Status:

- IUCN Red List: **Vulnerable**
- CITES: **Appendix I**
- The Wildlife Protection Act, 1972: **Schedule I**

Key facts on Nameri Tiger Reserve:

- It is situated in the northern part of the Sonitpur district of Assam, along the foothills of Arunachal Pradesh.
- The Nameri National Park constitutes the core of NTR, which is bound by rivers, viz. **Jia-Bhoreli in the west and Bor-Dikorai in the east**.
- The **Pakke Tiger Reserve of Arunachal Pradesh** is in the North and the habitat is contiguous.
- **Flora**: It is made up of **tropical evergreen, semi-evergreen, moist deciduous forests** with cane brakes and narrow strips of open grassland along rivers.
- **Fauna**:The habitat is biologically rich and is famous for the white winged wood duck,
- Even Leopard cat, common otter, Black giant squirrel, Indian mongoose, Large clawed shrew, Indian flying fox, slow loris, Assameese macaque, Rhesus macaque are also found here.

7 NATIONAL PARKS IN ASSAM

- 6th : Raimona National Park (Notified in 2021)
- 7th : Dihing Patkai National Park (Notified in June 2021)

GEOGRAPHY

The Indian National Centre for Ocean Information Services (INCOIS) has issued a warning to the coastal states about the "complete suspension of operational and recreational activities.

Swell Waves:

- These waves are formed by an **ocean swell**, hence the name swell waves/swell surge. A swell wave is the formation of **long wavelength waves** on the surface of the seas.
- They propagate along the interface between water and air. Thus, they are often referred to as **surface gravity waves.**
- **Origin**: Ocean swells do not occur due to the local winds, but rather due to **distant storms like hurricanes**, or even long periods of strong winds.
- Usually, states like **Kerala** witness swell waves as a result of strong winds in the southern part of the Indian Ocean, where an ocean swell is generated, and the waves then travel north to reach the coast in two or three days.
- **Influencing Factors**: The speed of the wind, the amount of ocean surface area affected by wind blowing in the same direction (also known as fetch), and the amount of time those winds blow over the same part of the ocean.
- **Potential for Swell Surges**: This is due to the potential for swell surges and rough sea conditions caused by the influence of high-period swell waves approaching from the distant southern Indian Ocean.
- **Origin and Movement of High-Period Swells**: The high period swells had started at approximately 10,000 km away from the Indian coast in the southern Atlantic Ocean and slowly moved towards the southern Indian Ocean.
- This had caused the high energy swell propagation towards the Indian coastal regions which is expected to hit the southern tip of India in the early hours of May 4.
- These long-period swells combined with high tide conditions can cause coastal flooding in the low-lying areas on May 4 & 5.

Features of Swell Waves:

- **Narrow range of Frequencies**: Swells have **a narrower range** of frequencies and directions than locally generated wind waves.

- Swells take on a more defined shape and direction and are less random than locally generated wind waves.
- In terms of directionality, they are characterised by the direction from where it emanates instead of where it is headed.
- **Wavelength**: Swell waves often have a long wavelength but this varies with the size of the water body. Their wavelengths may rarely exceed more **than 150 m**.
- Swell wavelength, also, varies from event to event. Occasionally, swells which are longer than 700 m occur as a result of the most severe storms.
- Earlier Instances of Swell Waves in India: The swell waves in March were generated after a low atmospheric pressure system moved over the region from the South Atlantic Ocean.
- INCOIS provides **Ocean State Forecast (OSF) Services** detailing wave height, direction, period, sea surface currents, temperature, and more.
- **Swell Surge Forecast System**: To forecast swell waves, INCOIS launched it in 2020 which can give forewarning seven days in advance.
- The arrival of the pressure system resulted in strong winds, which led to the formation of swell waves of up to 11 metres in height. These waves hit the Kerala coast and Lakshadweep.

Difference between Swell waves and Tsunamis:

- **Distinguishing Characteristic**: Unlike swell waves, a tsunami is a series of enormous waves created by an **underwater disturbance** usually associated with earthquakes occurring below or near the ocean.
- Tsunamis are around **10 times faster** than swell waves. Although both swell waves and tsunamis slow down near the coast, the swell waves hit land at 30–50 km/h.

The 3rd edition of the World Wildlife Crime Report (WWCR)-2024 was released by the United Nations Office on Drugs and Crime (UNODC).

Key Findings of the Report:

- Unlawful trade in about 4,000 wildlife species — 3,250 of which are listed as endangered.
- During the 2015–2021 period, over **1.40 lakh records** of seizures were reported in 162 countries and territories.
- A total of 3,250 species involved in the seizures are listed in the **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** Appendices.
- Seizures included 444 mammal species, 751 birds, 405 reptiles, and 52 amphibians. According to the Indian Union for Conservation of Nature (IUCN) Red List, the conservation status of these species is 'Threatened', 'Near Threatened', 'Least Concerned', and stable or increasing.
- Species worst affected by wildlife trafficking include **rhinoceros (29%), pangolins (28%), elephants (15%),** turtles & tortoises (2%), seahorses (2%), carnivores (2%), parrots (2%), snakes (2%), crocodilians (5%), and eels (5%).
- Commodities in trade from trafficked animals include live (15%), others (28%), medicines (10%), coral pieces (16%), and ivory, meat, roots, bodies, small leather products, shells, and extracts (31%).
- Despite some progress, the UNODC reported an increase in the proportion of illegal wildlife trade in the global wildlife trade, particularly during the COVID-19 pandemic in 2020 and 2021.

The Cook Islands is at the vanguard of a quest to mine the ocean floor for minerals used in electric car batteries.

Cook Islands:

- It is a **self-governing island state** in free association with **New Zealand.**

- Location: It is located in the **South Pacific Ocean**, between **Tonga** to the west and **French Polynesia** to the east.
- It consists of 15 islands divided into a northern group of six islands and a southern group of nine islands.
- **Northern Islands**: These are mostly low-lying and sparsely populated coral atolls; and include the islands of Manihiki, Nassau, Penrhyn, Pukapuka, Rakahanga, and Suwarrow and are covered in light vegetation and equipped with stunning white sand beaches.
- **Southern islands**: These generally consists of much larger higher islands that are **volcanic in origin** and more densely populated. The southern island group includes Rarotonga, Aitutaki, Atiu, Mangaia, Manuae, Mauke, Mitiaro, Palmerston, and Takutea.
- The highest point is **Te Manga** which rises to 652m on the **Rarotonga island.**
- Population: Most of the population is found on the island of Rarotonga.
- Capital city: **Avarua**, which is on Rarotonga island.

Indian Ocean basin-wide (IOBW) index exhibits a close association with dengue outbreaks in both the Northern and Southern hemispheres.

Indian Ocean basin-wide (IOBW) Index:

- It represents the **average sea-surface temperature** variations across the tropical Indian Ocean.

- It has emerged as a key indicator for predicting the magnitude and **timing of dengue epidemics** in each country.
- IOBW index's association with the Southern Hemisphere is stronger than that with the Northern Hemisphere.
- The index has a more pronounced impact on temperatures in tropical regions. Brazil, for example, bears a higher burden of dengue in the Southern Hemisphere.
- The **Northern Hemisphere** witnesses a peak dengue epidemic period between **July and October** and the **Southern Hemisphere in February and April,** both in the summers.
- Further, the amplitude of dengue incidence was high when the index was positive and low when it was negative.
- The link between the Indian Ocean's temperature and dengue incidence is likely due to its influence on regional temperatures through teleconnections, large-scale atmospheric patterns that can transfer heat and moisture across vast distances.

Dengue:

- It is caused by the **dengue virus (DENV)**
- **Transmission**: It is transmitted to humans through the bites of infected female mosquitoes, primarily the **Aedes aegypti mosquito**.
- The severe form of dengue fever, also called dengue hemorrhagic fever, can cause serious bleeding, a sudden drop in blood pressure (shock) and death.
- It is more common in tropical and subtropical climates.
- Symptoms: The most common symptoms are high fever, headache, body aches, nausea and rash.

Less rainfall, high temperature: Tea production in Assam, Bengal may fall by 50%

Tea Crop (Camellia sinensis):

- **Camellia sinensis** is an **evergreen shrub** or small tree belonging to the plant family **Theaceae**.

Climatic Requirements:

- Optimal temperature range: **20-30°C**.
- Rainfall needs: **150-300 cm**, evenly distributed throughout the year.
- Prefers a humid and moderate climate.

Soil conditions:

- Requires deep, well-drained, **friable loamy** soils.
- Soil should be rich in **humus** and organic matter.
- Ideal soil pH is between **4.5 to 5.5**.

Major Tea-producing States in India:

- Assam,
- West Bengal (including Darjeeling, Dooars, Terai),
- Tamil Nadu (including the Nilgiris),
- Kerala, and
- Karnataka.

Plant Physiology:

- Tea plants are typically pruned to remain under 2 meters in height.
- Its leaves range from 4 to 15 cm in length and 2 to 5 cm in width, with young leaves featuring light green color and white hairs.
- The flowers of the tea plant are white and yellow, measuring 2.5 to 4 cm in diameter.

Common diseases and pests:

- Blister blight, **red rust**, and **root-knot nematode**.
- Pest management often involves regular pruning and the use of organic fertilizers.

Tea Board of India:

- The Tea Board was established in **1953 under the Tea Act** and began its operations in 1954.
- Its headquarters is located in **Kolkata, West Bengal**.

Functions and objectives:

- It is tasked with the development and promotion of the tea industry in India.
- Implements various schemes for promoting tea and improving its quality.
- Regulates tea production, exports, and marketing.
- Facilitates research and development in tea cultivation and processing techniques.

Structure:

- The Tea Board comprises **31 members** including the Chairman.
- Its membership includes representatives from Parliament, tea producers, traders, brokers, consumers, state governments, and trade unions.
- It is **reconstituted every three years**.

Schemes and initiatives:

- Tea Development and Promotion Scheme.
- Wage Compensation Scheme.
- Tea Boutiques, aimed at enhancing retail presence.

India's first research testbed to study Nor'westers getting ready

- Though the Norwesters were less active this summer, there were occasional instances in April and early May.
- Strong winds and thunderstorms swept through the northern districts of West Bengal, Assam and Tripura, killing at least five people last month.
- *Research Testbed Facility to Study Norwesters:*
- The proposed facility will cover a large area adjoining West Bengal, Odisha, and Jharkhand.

- The control centre will be at **Chandbali** in the Bhadrak district of Odisha, about 130 km east of Bhubaneswar.
- **Development**: India Meteorological Department (IMD), Indian Institute of Tropical Meteorology (IITM), Pune, and **National Centre for Medium-Range Weather Forecasting** (NCMRWF), Delhi, will jointly develop and use this facility.
- Minister of Earth Sciences, stated that the facility will be completed by 2026.
- **Aim**: It aims to study thunderstorms from the formation stage, growth, and propagation over eastern parts of the country.
- This will be done using meteorological instruments, drones, and other equipment that will aid in systematically tracking thunderstorms.
- IMD, Pune, will collate all the data generated from the testbed facility for further research and analysis.
- **Complementing Existing Mechanisms**: It will house several high-end instruments complementing the existing observational mechanisms.
- The eastern India region is currently covered by meteorological radars supported by a network of instruments to record upper air and surface observations.
- **Significance**: The large volumes of data generated from the facility are expected to help forecasters make timely thunderstorm predictions, issue nowcast warnings (an event in less than three hours), and ultimately save lives.
- This can help make better predictions and generate early warning mechanisms to save lives and property.
- Improved Lead Times for Extreme Weather Events: The IMD currently issues **nowcast warnings** for extreme weather events with a lead time of three hours.

- With the establishment of the first dedicated testbed for thunderstorms, the goal is to provide warnings with improved lead times and to map the areas likely to be most affected.
- This will give *the administration and local communities more time to prepare and respond effectively.*

Norwesters:

- Originating over east and northeast India, south Nepal, Bhutan and Bangladesh, the norwesters are **extremely severe thunderstorms** accompanied by **squally winds**.
- These storms usually travel from northwest to southeast direction locally known as**"Kalbaisakhi"** and **"Barodoli Cheerha"** in Assam.
- **A squall** is a sudden, sharp increase in wind speed lasting minutes, as opposed to a **wind gust**, which lasts for only seconds.
- Impact: It brings destruction in terms of lightning, thunderstorms, hailstorms and rainfall. It is beneficial for pre-Kharif crops such as paddy, jute, and many other fruits and vegetables.
- Need for In-depth Study of Norwesters' Genesis and Processes: Norwesters are severe thunderstorms that need further investigation with respect to its genesis at the micro level and other processes involved.
- *Other Local Storms of Hot Weather Season:*
- **Loo**: Hot and dry winds blowing in the Northern plains.
- **Mango Shower**: Pre-monsoon showers towards the end of summer in Kerala and coastal areas of Karnataka that help in the early ripening of mangoes.
- **Blossom Shower**: It helps coffee flowers to blossom in Kerala and nearby areas.

Mechanism:

- Heating Induced Convection: In the early summer months (March and April), the daytime landmass heating over these regions triggers convection over some areas of Bihar, Jharkhand, Chhattisgarh, Odisha, and sub-Himalayan West Bengal.
- Interaction with Warm, Moist Air Masses Over the Bay of Bengal: As these convective clouds move towards West Bengal and Bangladesh, the norwesters mix with the warm, moist air mass persistent over the Bay of Bengal, causing significant wind discontinuity.
- Ideal Conditions for Thunderstorm Development: The local hills, thick forest cover, and the sea breeze make it ideal for developing thunderstorm cloud cells.
- These thunderstorm events usually prevail between two to four hours during late afternoon hours.

Severe Cyclone Remal.

- Cycone remal is a tropical cyclone in the Northern Indian Ocean (Bay of Bengal).
- The name **"Remal"** in the list of tropical cyclones is given by **Oman**. It will be the first cyclone to hit the region this 2024 pre-monsoon season. Remal means “sand” in Arabic.
- This naming follows a standard protocol for cyclones in the Bay of Bengal and Arabian Sea.

Reason behind arrival and formation of Remal Cyclone:

- **Sea Surface Warming**: One of the main reasons for Remal’s formation and strengthening is the **warming of sea water**.
- As the sea surface temperature rises, it provides energy for cyclones to develop and intensify.
- **Low Wind Shear**: Strong winds at different altitudes can interfere with cyclone development.

- Areas with low wind shear create a more favorable environment for a storm to organize and strengthen.
- **Moist Atmosphere**: Tropical cyclones thrive on moisture in the atmosphere.
- Abundant moisture allows for condensation, which releases energy further fueling the storm.
- **Atmospheric Instability**: Certain atmospheric conditions create instability, allowing warm, moist air to rise rapidly.
- This rising air cools and condenses that forms clouds and releases energy that powers the cyclone.

About Cyclone:

- Cyclone is a large air mass. It rotates around a central point of low atmospheric pressure.
- When viewed from above.
- In the **Northern Hemisphere**, it rotates **Counterclockwise**.
- In the **Southern Hemisphere**, it **rotates clockwise**.

Required condition for a Cyclone:

1. Sea surface with high temperature (above 27^0).
2. Presence of coriolis effect for the creation of a cyclonic vortex.
3. Small variations in the vertical wind speed.
4. Latent heat for driving storm's energy
5. Upper level divergence above the Sea Level System.

Naming Cyclones in the North Indian Ocean:

- **Panel on Tropical Cyclones (PTC):** The World Meteorological Organization (WMO) formed the Panel on Tropical Cyclones (PTC) in **1972**.
- Originally comprised eight member countries: **Bangladesh, India, Maldives, Myanmar, Pakistan, Sri Lanka, Sultanate of Oman, and Thailand.**

- **Naming Cyclones:**At the twenty-seventh session in **2000 in Muscat**, Oman, the PTC decided to assign names to tropical cyclones in the Bay of Bengal and Arabian Sea.
- Cyclone naming started in 2004 after finalizing a list based on recommendations from panel countries.
- **Expansion of the PTC**:In 2018, the PTC expanded to include Iran, Qatar, Saudi Arabia, United Arab Emirates, and Yemen.
- **Current Cyclone Naming List**:In April 2020, a list of 169 cyclone names was released, with 13 suggestions from each of the 13 countries. This list is currently in use.

Guiding Principles for Cyclone:

- **Neutrality**: Proposed names should be neutral and not favour any particular political party, religion, culture, or gender.
- **Sensitivity**: Name should not hurt the sentiments of the people around the world.
- **Respectful Tone**: Name should be short, easy to pronounce and not offensive, cruel, and rude.
- **Length Limit**: Cyclones name can go to maximum eight letters long.

Impact of Cyclone Remal:

- Cyclone Remal's landfall brought widespread destruction and disruption to coastal India and Bangladesh.

SCIENCE AND TECHNOLOGY

50th anniversary of the Expanded Programme on Immunization (EPI)

- The year 2024 commemorates **50 years** since the launch of the **Expanded Programme on Immunization (EPI)** by the **World Health Organization (WHO) in 1974** which is now known as the **Essential Programme on Immunization**.

Essential Programme on Immunization:

- It was launched as the Expanded Programme on Immunization (EPI) by World Health Organisation in 1974 to ensure that all children, in all countries, benefited from life-saving vaccines.
- This programme has evolved into what is now commonly known as the Essential Programme on Immunization.
- **Disease covered (Total 13)**
- Initially this programme focused on protection against six childhood vaccine-preventable diseases namely Bacillus Calmette-Guérin (BCG), diphtheria, pertussis, tetanus, polio, and measles.
- Later on WHO **added 7 more disease** under this initiative **Haemophilus influenzae type B (Hib)**, **Hepatitis B (HepB)**, **rubella**, pneumococcal disease (PNC), **rotavirus (Rota)**, **human papillomavirus (HPV)**, and COVID-19 (for adults).

India's Universal Immunization Programme (UIP)

- India launched the EPI in **1978**, which was later renamed as the **Universal Immunization Programme (UIP) in 1985**.
- **Objectives:**
- To rapidly increase immunization coverage.
- To improve the quality of services.
- To establish a reliable cold chain system to the health facility level.
- Monitoring of performance.
- To achieve self-sufficiency in vaccine production.

Eligibility:

- All beneficiaries' namely pregnant women and children can get themselves vaccinated at the nearest Government/Private health facility or at an immunization session site (Anganwadicentres/ other identified sites) near to their village/urban locality on fixed days.
- The UIP covers **all** sections of the society across the country with the same high quality vaccines.
- Under UIP, immunization is providing free of cost against 12 vaccine preventable diseases
- **Nationally against 9 diseases** - Diphtheria, **Pertussis**, Tetanus, Polio, Measles, Rubella, severe form of Childhood Tuberculosis, Hepatitis B and **Meningitis** & Pneumonia caused by Hemophilus Influenza type B
- **Sub-nationally against 3 diseases** - **Rotavirus diarrhoea, Pneumococcal Pneumonia and Japanese Encephalitis**; of which Rotavirus vaccine and Pneumococcal Conjugate vaccine are in process of expansion while JE vaccine is provided only in endemic districts.

Tokyo Atacama Observatory (TAO) Project

- Tokyo Atacama Observatory (TAO) telescope site in Santiago, Chile is now open for business.

Tokyo Atacama Observatory (TAO):

- The University of Tokyo Atacama Observatory (TAO) Project aims to construct a **6.5 meter optical-infrared telescope** at the summit of Cerro Chajnantor, which is at an altitude of **5,640 meters in the Atacama Desert of Chile**.
- **Cerro Chajnantor** is noted as **the world"s highest astronomical site**.
- The region's high altitude, thin atmosphere, and perennially arid climate are ideal for observing almost the entire range of near-infrared wavelength.

Instruments and Research Focus:

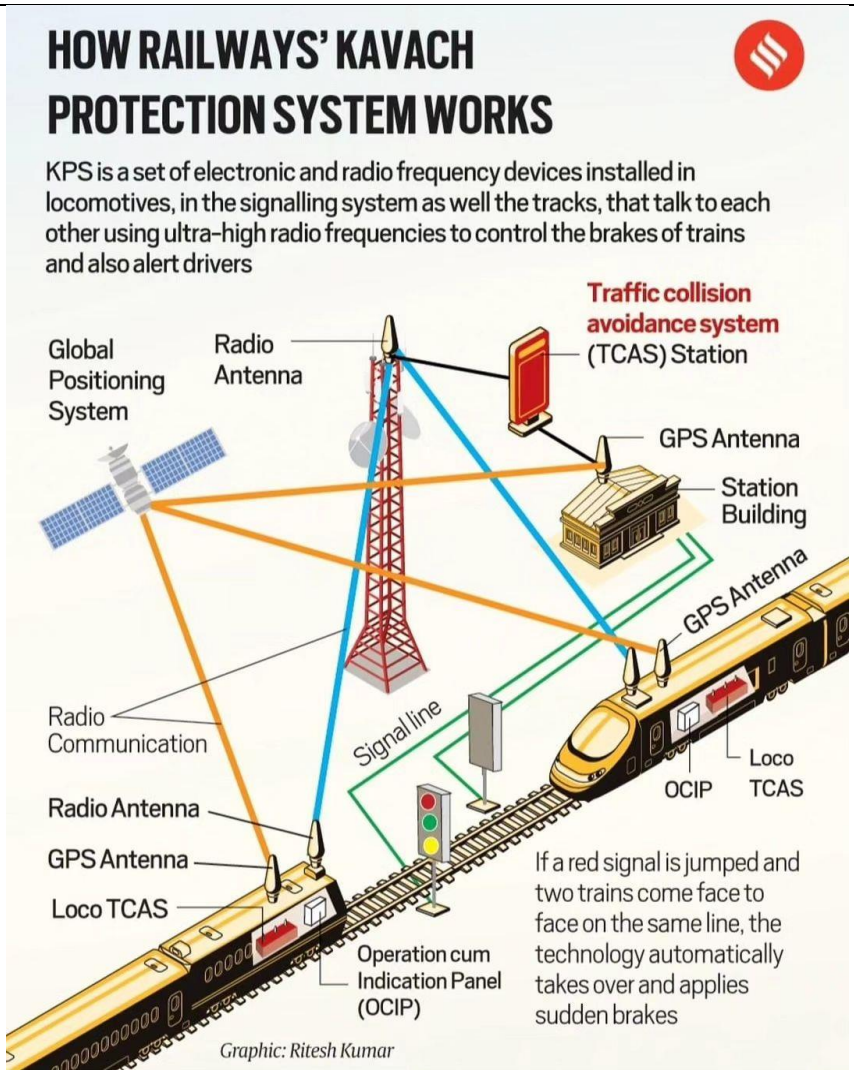
- **SWIMS (Simultaneous-color Wide-field Infrared Multi-object Spectrograph)**: Aimed at understanding the evolution of galaxies.
- **MIMIZUKU (Mid-Infrared Multi-field Imager for gaZing at the UnKnown Universe)**: Used to study planet formation and the origin of materials.
- The TAO project is promoted by the Institute of Astronomy (IoA) at the University of Tokyo, in collaboration with the Department of Astronomy at the University of Tokyo.
- It includes partnerships with many other Japanese facilities such as the National Astronomical Observatory, **ISAS/JAXA**, other universities, and the Department of Astronomy at the University of Chile.
- The telescope is dedicated to enhancing our understanding of the nature of the Universe and the origin of life.

KAVACH (train collision avoidance system)

- **RailTel Corporation of India** signed an MOU with a tech firm for exploring and delivering **KAVACH** (train collision avoidance system) implementation projects in India and abroad.

KAVACH:

- KAVACH, initially known as **Train Collision Avoidance System (TCAS)**, is an indigenously developed **Automatic Train Protection (ATP) system**.
- It was developed by the Research Designs & Standards Organisation (RDSO) in collaboration with the Indian industry, with development starting in **2011**.
- B.**Rajaram**, known for the **Skybus Metro system**, played a significant role in its development.
- Field trials commenced in 2014, leading to refinement of the system, and it received final approval in 2019.



Features and Specifications:

- KAVACH operates to **Safety Integrity Level 4 (SIL-4)** standards, indicating a very high level of safety with a probability of error being 1 in 10,000 years.
- It includes centralized live monitoring of train movements, automatic braking to prevent overspeeding, and SoS message relaying.

- The system comprises **trackside RFID tags**, **onboard locomotive equipment**, and **radio infrastructure**, facilitating real-time train monitoring and communication via radio.
- Drivers are alerted, and **automatic braking is triggered** to prevent collisions, using various data inputs like location, direction, and time.
- *Operational Impact and Challenges:*
- KAVACH helps prevent collisions by alerting locomotive pilots about a **'red signal'**; if the pilot fails to slow down below 15 kmph, it automatically applies the brakes.
- Event recorders retain records of interactions and incidents for analysis.
- However, implementing KAVACH comes at a high cost of **₹50 lakh per kilometer**, and it currently covers only 1,500 kilometers of the total 68,000-kilometer network of Indian Railways as of November 2023, posing significant expansion challenges.

Newly Discovered Peptide Could Treat Incurable Bacterial Infections.

- A peptide with **antimicrobial properties** derived from cows shows promise for treating incurable infections from the bacteria commonly found in the intestines.

The Threat of Antibiotic Resistance:

- The CDC reports that antibiotic-resistant bacteria are a growing global health threat. A 2019 study found that nearly **5 million people died** worldwide that year from drug-resistant infections. A large portion of those deaths are attributable to **K. pneumoniae** because it has a 50% death rate without antibiotic therapy.
- These bacteria are more resistant to drugs when they live in a **biofilm** — microorganisms that stick together and are embedded in a **protective slime**.

Recent studies have shown that 60-80% of infections are associated with bacteria biofilms, which increase their drug resistance.

- *Peptides:*
- Peptides are chains of **amino acids** that are naturally found in the body.
- The amino acids in a peptide are connected to one another in a sequence by bonds called peptide bonds.

Peptides vs. Protiens:

- Proteins and peptides are fundamental components of cells that carry out important biological functions.
- Typically, peptides are distinguished from proteins by **their shorter length**, although the cut-off number of amino acids for defining a peptide and protein can be arbitrary.
- Traditionally, peptides are defined as molecules that consist of **between 2 and 50 amino acids.**
- Meanwhile, proteins are long molecules made up of multiple peptide subunits, and are also known as **polypeptides**.
- In addition, peptides tend to be less well defined in structure than proteins, which can adopt complex conformations known as secondary, tertiary, and quaternary structures.
- Proteins can be digested by **enzymes (other proteins)** into short peptide fragments.

Functions of Peptides:

- The body makes lots of different peptides, each of which has a different role.

- They may provide pro-aging support, anti-inflammatory, or muscle-building properties.
- Some peptides act as hormones, which are molecules, that when released from cells, affect other areas of the body.
- Due to the potential health benefits of peptides, many supplements are available that contain peptides that manufacturers have derived either from food or made synthetically.

What are Amino Acids?

- Amino acids are molecules that combine to form proteins.
- Amino acids and proteins are the building blocks of life.
- There are **20 different amino acids**.
- A protein consists of one or more chains of amino acids (called polypeptides) whose sequence is encoded in a gene.
- Some amino acids can be synthesized in the body, but others **(essential amino acids)cannot** and must be obtained from a person's diet.
- The **nine essential amino acids** are: **histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine.**

Endosymbiotic Theory

- The endosymbiotic theory states that some of the **organelles** in today"s **eukaryotic cells** were once **prokaryotic microbes**.

- In this theory, the first eukaryotic cell was probably an **amoeba-like cell** that got nutrients by **phagocytosis** and contained a nucleus that formed when a piece of the **cytoplasmic membrane** pinched off around the **chromosomes**.
- Some of these amoeba-like organisms ingested prokaryotic cells that then survived within the organism and developed a symbiotic relationship.
- **Mitochondria** formed when bacteria capable of aerobic respiration were ingested; **chloroplasts** formed when photosynthetic bacteria were ingested. They eventually lost their cell wall and much of their DNA because they were not of benefit within the host cell.
- The endosymbiotic theory describes how a large host cell and ingested bacteria could easily become dependent on one another for survival, resulting in a permanent relationship.
- Over millions of years of evolution, mitochondria and chloroplasts have become more specialized, and today they cannot live outside the cell.

Prokaryotes vs. Eukaryotes:

- All living things can be divided into three basic domains: **Bacteria, Archaea, and Eukarya.**
- The primarily single-celled organisms found in the Bacteria and Archaea domains are known as prokaryotes. These organisms are made of prokaryotic cells—the smallest, simplest, and most ancient cells.
- Organisms in the Eukarya domain is made of more complex eukaryotic cells. These organisms, called eukaryotes, can be **unicellular or multicellular** and include animals, plants, fungi, and protists.

- The biggest distinction between them is that eukaryotic cells have a **distinct nucleus** containing the cell''s genetic material, while prokaryotic cells don''t have a nucleus and have **free-floating genetic material** instead.
- Eukaryotes developed at least **2.7 billion years ago**, following 1 to 1.5 billion years of prokaryotic evolution.
- Eukaryotic cells have several other membrane-bound organelles not found in prokaryotic cells. These include the mitochondria, rough and smooth endoplasmic reticulum, golgi complex, and in the case of plant cells, chloroplasts (conduct photosynthesis).
- Although prokaryotic and eukaryotic cells have many differences, they share some common features, including the following:
- **DNA**.
- Cell (or plasma) membrane
- **Cytoplasm**: Jelly-like fluid within a cell that is composed primarily of water, salts, and proteins.
- **Ribosomes**: Organelles that make proteins.

India''s first high-performance System-On-Chip (SoC), developed by an IIT-Madras incubated startup.

- It will reduces dependency on imported chips, enhancing self-sufficiency in the semiconductor sector.

System-On-Chip (SoC):

- An SoC integrates multiple electronic components into a **single chip**, functioning like a mini-computer.
- Embedded into the **printed circuit board (PCB)** of various devices, enhancing their compactness and efficiency.
- Secure IoT runs at 700 MHz, positioning it as a high-performance microcontroller.

Key Features

- **Cost-effective**: Costs 30% less than other chips in the same category.
- **Versatility and adaptability**: Designed to be flexible for use in a wide range of applications.
- **Security**: Features top-notch security measures suitable for modern demands.
- **High computing power**: Capable of managing complex operations across various devices.
- **Programmability**: Allows for customization according to specific requirements of devices.
- *Applications*
- Used in deep embedded applications like **smart locks, fans, speakers, and wearables**.
- Applicable to smart city devices, such as connected systems for electricity, water, and gas metering.
- Enhances features of automotive technologies, including EV battery management systems.
- Suitable for IoT devices across different sectors including vision technologies and home automation.

Kerala"s health department recently reported West Nile fever cases in three districts.

West Nile Fever:

- It is a disease caused by the **West Nile Virus (WNV).**
- WNV is a member of the **flavivirus genus** and belongs to **the Japanese encephalitis** antigenic complex of the family Flaviviridae.
- Birds are the **natural hosts** of WNV.
- The virus is commonly found in Africa, Europe, the Middle East, North America, and West Asia.
- It can cause a deadly neurological disease in humans.
- It is named after the **West Nile district of Uganda**, where it was first identified in 1937.

Transmission:

- It is most commonly spread to people by the bite of an infected **mosquito**. The mosquitoes get the virus when they bite an infected bird.
- There is no evidence that WNV can be spread directly from one person to another.
- But there have been a few cases where it has spread through organ transplants.

Symptoms:

- Most people infected by the virus are asymptomatic (no symptoms).
- Symptoms include fever, headache, tiredness, body aches, nausea, vomiting, occasional skin rash, and swollen lymph glands.
- The symptoms of severe disease (also called neuroinvasive disease, such as West Nile encephalitis or meningitis or West Nile poliomyelitis) include headache, high fever, neck stiffness, stupor (near-unconsciousness), disorientation, coma, tremors, convulsions, muscle weakness, and paralysis.

Treatment:

- There is **no medicine or vaccine** available against the WNV.
- Treatment is based on supportive care involving hospitalisation, intravenous fluids, respiratory support, and prevention of secondary infections.

Nerium Oleander's Toxicity

- Two Kerala government-controlled temple boards have banned use of oleander in temple offerings after a 24-year old woman died after accidentally **chewing some oleander leaves**.

Oleander flowers:

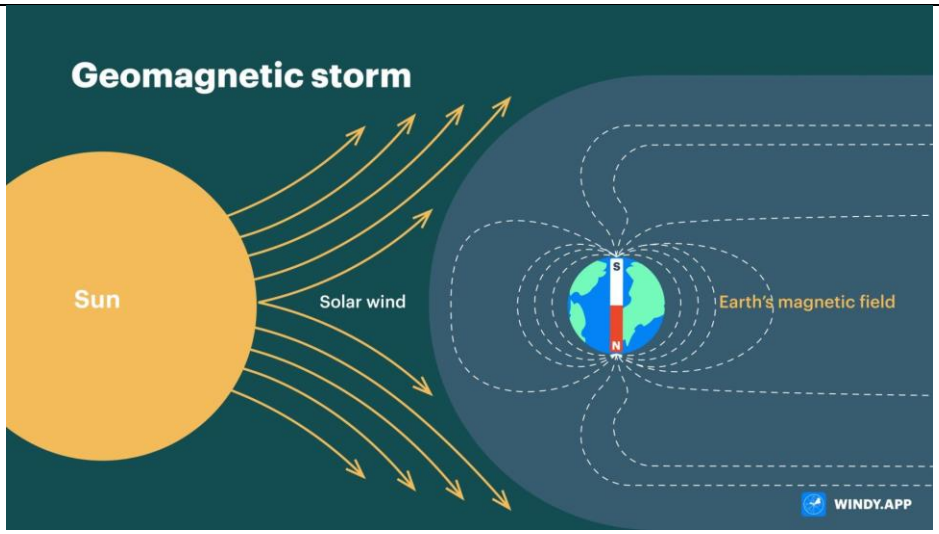
- **Nerium oleander**, commonly known as **oleander or rosebay**, is a plant cultivated worldwide in tropical, subtropical, and temperate regions.
- It is known for its **drought tolerance**, the shrub is often used for ornamental and landscaping purposes.
- In Kerala, the plant is known by the names of **arali and kanaveeram**, and is grown along highways and beaches as a natural, green fencing.
- There are different varieties of oleander, each with a flower of a different colour.
- The plant has been frequently described in **Brihattrayi, Nighantus** and other classical **Ayurvedic texts**.
- **Charka [Charak Samhita]** has prescribed the leaves of white flowered variety externally in chronic and obstinate skin diseases of serious nature including leprosy.
- According to **Ayurvedic Pharmacopoeia of India (API)** an oil prepared from the root bark can be used to treat skin diseases.
- **Oleander's toxicity**
- **Ingestion or inhalation of smoke** from burning oleander can be intoxicating.

- This is due to the properties of **cardiac glycosides** (a type of chemical) including **oleandrin, folinerin, and digitoxigenin**, which are present in all parts of the plant.
- Effects of oleander toxicity include nausea, diarrhea, vomiting, rashes, confusion, dizziness, irregular heartbeat, slow heartbeat, and, in extreme cases, death.

The strongest geomagnetic storm in over two decades recently hit Earth, causing radio blackouts and extending the northern lights to the southern United States.

Geomagnetic Storms:

- A geomagnetic storm is a major disturbance of **Earth's magnetosphere** that occurs when there is a very efficient exchange of energy from the **solar wind** into the space environment surrounding Earth.
- These storms result from variations in the solar wind that produce major changes in the currents, plasmas, and fields in Earth's magnetosphere.
- The solar wind conditions that are effective for creating geomagnetic storms are sustained (for several hours) periods of the high-speed solar wind and a **southward-directed solar wind magnetic field (opposite the direction of Earth's field) at the dayside of the magnetosphere.**
- The largest such storms are associated with **solar coronal mass ejections (CMEs),** where a billion tons or so of plasma from the sun, with its embedded magnetic field, arrives at Earth.



Effects:

- It results in intense currents in the magnetosphere, changes in the radiation belts, and changes in the ionosphere, including heating the ionosphere and an upper atmosphere region called the thermosphere.
- These storms can heat the **ionosphere**, causing beautiful **auroras** on earth.
- Because the ionosphere is heated and distorted during storms, long-range radio communication that relies on sub-ionospheric reflection gets affected.
- Ionospheric expansion due to these storms can increase satellite drag and make their orbits difficult to control.
- Satellite electronics can be damaged through the buildup and discharge of static-electric charges.
- It can disrupt global navigation systems.
- It can create harmful **geomagnetic-induced currents (GICs)** in the power grid and pipelines.

- **Auroras**, also known as **polar lights**, are natural light displays visible mainly in the high latitude regions around the Arctic and Antarctic.

Types of Auroras:

- **Aurora Borealis (Northern Lights)** – Visible in the Northern Hemisphere.
- **Aurora Australis (Southern Lights)** – Visible in the Southern Hemisphere.

Formation:

- Auroras are caused by the interaction between the Earth's magnetic field and charged particles from the Sun (solar wind).
- When these particles enter the Earth's atmosphere, they collide with gas particles like oxygen and nitrogen, resulting in light emission.

Colours and Visuals:

- Colors seen in auroras include green, red, yellow, blue, orange, and purple, depending on the type of gas and the collision energy.
- **Green** is produced by oxygen at about 100 km altitude, red by high-altitude oxygen around 300 km, and blue/purple by nitrogen.
- Auroras are displayed in various shapes such as spirals, curtains, and rays, often changing rapidly.

Occurrence:

- Predominantly observed near the magnetic poles in places like Alaska, Canada, Norway, and Antarctica.
- Recently, the night sky over **Hanle village in Ladakh** was illuminated by the northern lights due to an intense solar storm.

What is Solar Wind?

- It is a continual stream of protons and electrons from the sun's outermost atmosphere, **the corona**.
- These charged particles breeze through the solar system at speeds ranging from around 250 miles (400 kilometers) per second to 500 miles (800 km) per second, in a plasma state.
- Solar magnetic field is embedded in the plasma and flows outward with the solar wind.
- Different regions of the Sun produce solar wind of different speeds and densities.
- When the solar wind reaches Earth, it sends a flurry of charged particles into the magnetosphere and along Earth's magnetic field lines, towards the poles.

China has inaugurated the High Energy Photon Source (HEPS), which will be the first fourth-generation synchrotron light source in Asia.

- **Existing Synchrotrons**: Presently there are around 70 synchrotrons across the world that are either in operation or under construction.
- The fourth-generation club: Fourth-generation facilities rely on an array of magnets called a **multi-bend achromat lattice** to generate X-ray beams that are narrower and therefore brighter. Existing facilities include,
- Sweden's MAX IV Laboratory,
- Sirius in Campinas, Brazil,
- The European Synchrotron Radiation Facility's Extremely Brilliant Source in Grenoble, France.
- The Advanced Photon Source in Lemont, Illinois.

- *High Energy Photon Source (HEPS):*
- **Location**: It is situated 50 kilometers from Beijing in Huairou.
- **Budget**: It is a 4.8-billion-yuan (US$665-million) project.
- **Objective**: To produce a light source that will penetrate deep into samples to reveal their molecular and atomic structure in real time.
- **Scope**: Users can select from the existing 14 beamlines for experiments in subjects including biomedicine, energy, advanced materials and condensed-matter physics.
- Also, HEPS is expected to accommodate up to 90 beamlines which will impact every scientific field, except maths going forward.

Feature:

- **Produce Hard X Rays**: HEPS will accelerate electrons up to energies of 6 gigaelectron volts inside its storage ring, with a circumference of 1.36 kilometres, to produce high-energy, or hard X-rays to measure samples at nanometre scales.
- **Enabling Nano measurements**: Its time resolution will be 10,000 times better than that achieved by third-generation synchrotrons allowing researchers to make measurements in hundreds of nanoseconds instead of milliseconds
- **High Resolution Imaging**: HEPS's electron beam will be **the narrowest in the world**, allowing it to create particularly intense X-rays enabling researchers to obtain more information from their samples with the same dose of radiation.
- It will further drive scientists' understanding of the properties of matter and help in the development of new materials.
- **Speedy experimentation**: HEPS will also allow researchers to rapidly execute experiments that would have taken days to complete at older facilities.
- **Example**: To determine the atomic structure of proteins, researchers need to purify and coax these molecules into orderly crystal structures that can be visualized with

X-rays. Older synchrotrons require large samples that are difficult to produce, making it nearly impossible to study smaller protein crystals

What is synchrotron light?

- It is a type of circular particle accelerator which works by accelerating charged particles (electrons) through sequences of magnets until they reach almost the speed of light.
- **Formation of Synchrotron Light**: These fast-moving high energy electrons produce very bright light, by the 'synchronised' application of strong magnetic fields called synchrotron light.
- This very intense light, predominantly in the X-ray region, is millions of times brighter than light produced from conventional sources and 10 billion times brighter than the sun.
- **Significance**: The intense light which is produced by the electrons is then filtered and adjusted to travel into experimental workstations, where it is used to study minute matter such as atoms and molecules and reveals the innermost secrets of materials, from human tissue to plants to metals and more.
- **Origin**:
- It was built in **1946** and was designed to study collisions between high energy particles. Example: **The Large Hadron Collider at CERN**
- **The First synchrotron Light experiment**: In **1956**, the first experiments were carried out using synchrotron light drawn from a particle collider at Cornell in the USA
- **The First Dedicated facility**: In 1980 UK built **the world's first synchrotron** dedicated to producing synchrotron light for experiments at Daresbury in Cheshire.
- **Process:**

- 1st step: The electrons are generated by the electron gun in the centre of the synchrotron and accelerated to 99.9997% of the speed of light by the linear accelerator, or linac.
- 2nd step: The electrons are then transferred to the booster ring, where in approx. half a second, there is an increase in energy from 100 MeV to 3,000 MeV (or 3 GeV). They are then transferred to the outer storage ring.
- Final step: The electrons are circulated around the storage ring by a series of magnets separated by straight sections. As the electrons are deflected through the magnetic field, electromagnetic radiation is produced.
- Final Synchrotron light: At each bending magnet a beam of synchrotron light is produced and the electromagnetic radiation produced by the synchrotron is emitted in a narrow cone in the forward direction, at a tangent to the electron's orbit.
- *Properties of Synchrotron light:*
- **High brightness**: It is extremely intense (hundreds of thousands of times more intense than that from conventional x-ray tubes) and highly collimated.
- **Wide energy spectrum**: It can be generated across the range of the electromagnetic spectrum ie. from infrared to visible light to x-rays.
- **Tunable**: It is possible to obtain an intense beam of any selected wavelength.
- **Highly polarised**: The synchrotron emits highly polarised radiation, which can be linear, circular or elliptical.
- **Very short pulses**: Pulses are emitted in typically less than a nano-second (a billionth of a second), enabling time-resolved studies.

Recently, the World Health Organization (WHO) released its updated Bacterial Priority Pathogens List (BPPL) 2024.

Bacterial Pathogens Priority List:

- It is an important tool in the global fight against antimicrobial resistance.
- *Background*
- In 2017, WHO developed the first **BPPL** to guide investment into the R&D of new antibacterials and it listed **13 bacterial pathogens (phenotypes).**
- It was developed with the multi-criteria decision analysis (MCDA) method (15).
- MCDA is a decision-making scientific method that mounts and evaluates alternatives based on multiple criteria, facilitating systematic and transparent decision-making in complex options
- The 2024 WHO BPPL covers **24 pathogens**, spanning 15 families of antibiotic-resistant bacterial pathogens.
- The 2024 list categorizes these pathogens into critical, high, and medium priority groups to inform research and development (R&D) and public health interventions.
- *Significance*
- The WHO BPPL acts as a guide for prioritizing R&D and investments in AMR, emphasizing the need for regionally tailored strategies to effectively combat resistance.
- It targets developers of antibacterial medicines, academic and public research institutions, research funders, and public–private partnerships investing in AMR R&D, as well as policy-makers responsible for developing and implementing AMR policies and programs.

What is Antimicrobial Resistance (AMR)?

- It occurs when bacteria, viruses, fungi, and parasites no longer respond to medicines, making people sicker and increasing the risk of disease spread, illness and deaths.
- It is driven in large part by the misuse and overuse of antimicrobials

Recently, the FSSAI has published a comprehensive guidance document titled "Artificial Ripening of Fruits- Ethylene gas a safe fruit ripener".

- FSSAI Warns Against Use of Calcium Carbide for Ripening Action against Violators: FSSAI is also advising Food Safety Departments of States /UTs to remain vigilant and take serious action and deal stringently against person(s) indulging in such unlawful practices as per the provisions of **FSS Act, 2006** and Rules/Regulations made thereunder.
- Further, the **Central Insecticides Board and Registration Committee (CIB & RC)** has approved **Ethephon 39% SL** for the uniform ripening of mangoes and other fruits.

Calcium Carbide:

- **Manufacturing:** It is produced by heating lime and carbon mixture to **2000-2100°C** in an electric arc furnace.
- **Use:** It is commonly used for ripening fruits like mangoes.
- **Concern:** It releases acetylene gas which contains harmful traces of arsenic and phosphorus.
- These harmful substances, also known as **'Masala'**, can cause serious health issues such as dizziness, frequent thirst, irritation, weakness, difficulty in swallowing, vomiting and skin ulcers, etc.
- **Acetylene gas** is also equally hazardous to those handling it. There are chances that calcium carbide may come in direct contact with fruits during application and leave residues of arsenic and phosphorus on fruits.

About Above Mentioned Gases:

- **Ethylene**: It is a naturally occurring hormone in fruits, regulates the ripening process by initiating and controlling a series of chemical and biochemical activities.
- The treatment of unripe fruits with ethylene gas triggers the natural ripening process until the fruit itself starts producing ethylene in substantial quantities.
- **Ethephon**: It is a plant growth regulator used to promote fruit ripening, abscission, flower induction, and other responses.
- **Acetylene**: It is also called ethyne. It is a colorless gas which is used as a chemical building block widely and also as a fuel.

Regulations by the FSSAI:

- **Ban**: Due to these dangers, the use of calcium carbide for ripening fruits has been banned under Regulation 2.3.5 of the Food Safety and Standards (Prohibition and Restrictions on Sales) Regulations, 2011.
- **Permitted Safety Limits**: Considering the issue of rampant use of banned calcium carbide, FSSAI has permitted the use of ethylene gas as a safer alternative for fruit ripening in India.
- Ethylene gas can be used at concentrations up to **100 ppm (100 µl/L)**, depending upon the crop, variety and maturity.

Central Insecticides Board & Registration Committee:

- **Establishment**: It was set up by the Ministry of Agriculture and Farmers Welfare in 1970 to regulate the import, manufacture, sale, transport, distribution and use of insecticides.
- The insecticides are regulated under **Insecticides Act, 1968** and Insecticides Rules, 1971.
- **Mandate**: The Central Insecticides Board and Registration Committee is responsible to advise the Central and State governments on technical matters related to insecticides.

A new study by researchers found that ferroptosis is the major cell death mechanism that underlies COVID-19 lung disease.

Ferroptosis:

- Ferroptosis is a form of **regulated cell death** caused by a toxic buildup of **lipid peroxideson** cell membranes.
- It is different from other forms of cell death, such as apoptosis.
- This type of cell death requires **iron**, which is why it has the name "FERroptosis."
- *How does it happen?*
- Lipid peroxides, which are generated through normal metabolic activities, can lead to oxidative damage to cell membranes.
- Ferroptosisis characterized by a reduction in **intracellular glutathione (GSH)** and decreased activity of **glutathione peroxidase**, so that lipid peroxides cannot be oxidized, leading to an increase in **lipid peroxidation from iron**.
- Our cells have powerful defense mechanisms to maintain cell survival.
- However, when our defense mechanisms become defective, unchecked lipid peroxides accumulate to toxic levels, damage membrane integrity, and kill cells through ferroptosis.
- Several studies have linked ferroptosis with many diseases, including ischemia-reperfusion and kidney injuries, nervous system diseases, cancer, and blood diseases.
- *What is Apoptosis?*
- Apoptosis is a process of **programmed cell death** that occurs in multicellular organisms.

- It is a highly regulated and controlled process that occurs normally during development and aging as a **homeostatic mechanism** to maintain cell populations in tissues.
- For example, the separation of fingers and toes in a developing human embryo occurs because cells between **the digits undergo apoptosis**.
- Apoptosis also occurs as a defence mechanism such as in immune reactions or when cells get damaged by disease or by noxious agents.
- Apoptosis can be triggered by mild cellular injury and by various factors internal or external to the cell; the damaged cells are then disposed of in an orderly fashion.
- Apoptosis involves condensation of the nucleus and cytoplasm, followed by cellular partitioning into well-defined fragments for disposal.

IIT Madras-incubated ePlane Company is expected to launch electric Vertical Take-Off and Landing (eVTOL) aircraft in Bengaluru.

electric Vertical Take-Off and Landing Aircraft (eVTOL):

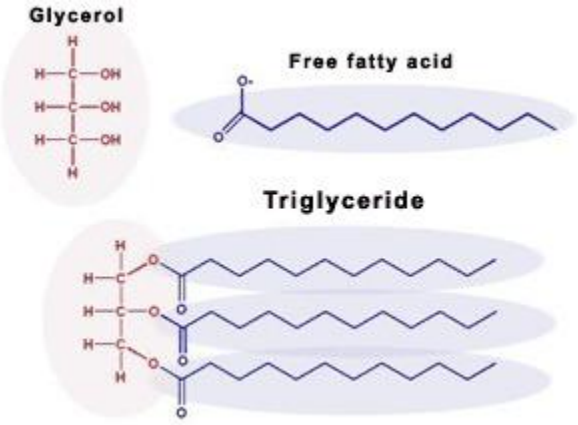
- eVTOLs are designed to take off and land vertically, which allows them to operate effectively in **congested urban areas**.
- These aircraft utilize electric propulsion to achieve lift and controlled flight, significantly reducing noise and air pollution compared to traditional aircraft.
- eVTOLs are equipped with electric motors that drive rotors or propellers. These are arranged in various configurations to provide lift and enable movement in all directions.

- The power for these aircraft is supplied by energy storage systems, commonly **lithium-ion batteries**, which store the necessary energy for both lift-off and flight.
- They employ distributed **electric propulsion technology**, integrating multiple motors with the airframe to enhance efficiency and ensure safety. This technology has developed from advancements in motor, battery, fuel cell, and electronic controller technologies.
- The typical seating capacity of eVTOLs can include configurations like six-seaters and eight-seaters, highlighting their role in low-altitude urban air mobility for a small number of passengers.
- eVTOLs have a wide range of applications including **air taxis, cargo transport, emergency medical services (EMS),** and recreational purposes.
- They promise to significantly enhance on-demand **urban air mobility (UAM),** improving connections between city centers and airports, and addressing issues like traffic congestion and accessibility.
- Applications and Benefits:
- Air taxis and delivery services can utilize eVTOLs to bypass road traffic, offering faster and more efficient transportation options.
- Medical assistance and emergency services can greatly benefit from the quick response capabilities of eVTOLs.

A recent study challenges the perceived heart health benefits of fish oil supplements rich in omega-3 fatty acids, raising concerns about their impact on cardiovascular health.

Fatty Acids:

- Fatty acids are the building blocks of the fat in our bodies and in the food we eat.
- During digestion, the body breaks down **fats into fatty acids**, which can then be absorbed into the blood.
- Fatty acid molecules are usually joined together in groups of three, forming a molecule called a **triglyceride**.
- Triglycerides are also made in our bodies from the carbohydrates that we eat.
- The two main types of fatty acids are **saturated fat and unsaturated fat**.
- Saturated fats are sometimes known **as "bad" or "unhealthy" fats** because they increase your risk of certain diseases like heart disease and stroke.
- **Unsaturated fats (polyunsaturated and monounsaturated) are considered "good" or "healthy" fats** because they support your heart health when used in moderation.



Omega-3 Fatty Acids:

- Omega-3 fatty acids (omega-3s) are **polyunsaturated fats** that perform important functions in your body.
- Your body can't produce the amount of omega-3s you need to survive.

- So, omega-3 fatty acids are essential nutrients, meaning you need to get them from the foods you eat.
- They are found in foods, such as **fish and flaxseed**, and in dietary supplements, such as **fish oil.**
- The three main omega-3 fatty acids are **alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA).**
- ALA is found mainly in plant oils such as **flaxseed, soybean, and canola oils**. DHA and EPA are found in fish and other seafood.
- Omega-3s are important components of the membranes that surround each cell in your body.
- DHA levels are especially high in retina (eye), brain, and sperm cells.
- Omega-3s also provide calories to give your body energy and have many functions in your heart, blood vessels, lungs, immune system, and endocrine system (the network of hormone-producing glands).
- Omega-3s in fish and fish oil supplements may help with symptoms of several autoimmune diseases like rheumatoid arthritis, lupus, and **Crohn''s disease**.

Recently, between January and March 2024, about 32,000 cases of Whooping Cough were reported across Europe.

Whooping Cough:

- Whooping cough, caused by **Bordetella pertussis bacteria**, affects the respiratory system. It's recognized by severe coughing fits, sometimes with a distinctive **"whooping" sound**. It is particularly dangerous for infants and can lead to complications such as pneumonia and, in some cases, death.

- **Transmission**: The bacteria is transmitted through respiratory droplets when someone with the infection coughs or sneezes. It sticks to the throat lining and releases toxins that damage tiny hair-like structures that clear debris and mucus.
- This causes inflammation in the airways, resulting in severe coughing fits and breathing problems.
- **Symptoms**: Whooping cough begins with cold-like symptoms, with a slight fever, then leads to intense coughing with a unique "whoop" sound.
- Coughing fits may cause vomiting, and infants and young children may have trouble breathing during sleep.
- **Diagnosis**: Identifying whooping cough relies on clinical symptoms, medical background, and specific tests:
- **Nasopharyngeal swab**: This gathers respiratory secretions for PCR testing.
- **Blood tests**: These detect antibodies against Bordetella pertussis.
- **Treatment**: Prompt treatment is vital to prevent complications and alleviate symptoms.
- Doctors often prescribe antibiotics such as **azithromycin**, **erythromycin, or clarithromycin** to infected individuals. This helps shorten the illness duration and decreases transmission.
- Supportive care may involve staying hydrated, resting, and keeping an eye out for complications like pneumonia or dehydration.
- **Prevention Measures**: Vaccination stands as the most effective safeguard against whooping cough. Vaccines **like DTaP (diphtheria, tetanus, and pertussis) and Tdap** are advised for children.

Earlier in May 2024, a team of researchers at Banaras Hindu University (BHU) had conducted a one-year follow-up study on Covaxin vaccine.

- The **Covaxin** vaccine was developed by the **Bharat Biotech** in collaboration with the **Indian Council of Medical Research (ICMR)** to fight against coronavirus.
- The participants were interviewed over phone about long-term adverse events of special interest (AESI) after one year of vaccination.
- The study found nearly one third of the individuals who received Covaxin were reported to have faced AESI.
- These include viral upper respiratory tract infections, menstrual abnormalities and **Guillain-Barre Syndrome**.

ICMR:

- The Indian Council of Medical Research (ICMR) is the premier national agency in India for the formulation, coordination, and promotion of biomedical research.
- The ICMR was originally established in **1911** by the name of the **Indian Research Fund Association (IRFA)**. It was redesignated as the ICMR in 1949.
- **Objective**: To conduct and support research that addresses the health challenges faced by the Indian population.
- **Funding and Support**: The organization provides funding and support for research projects undertaken by various institutions, including universities, medical colleges, and research laboratories across India.
- **Ethics and Standards**: ICMR sets ethical standards for conducting medical research, ensuring that studies are carried out in a responsible and ethical manner.

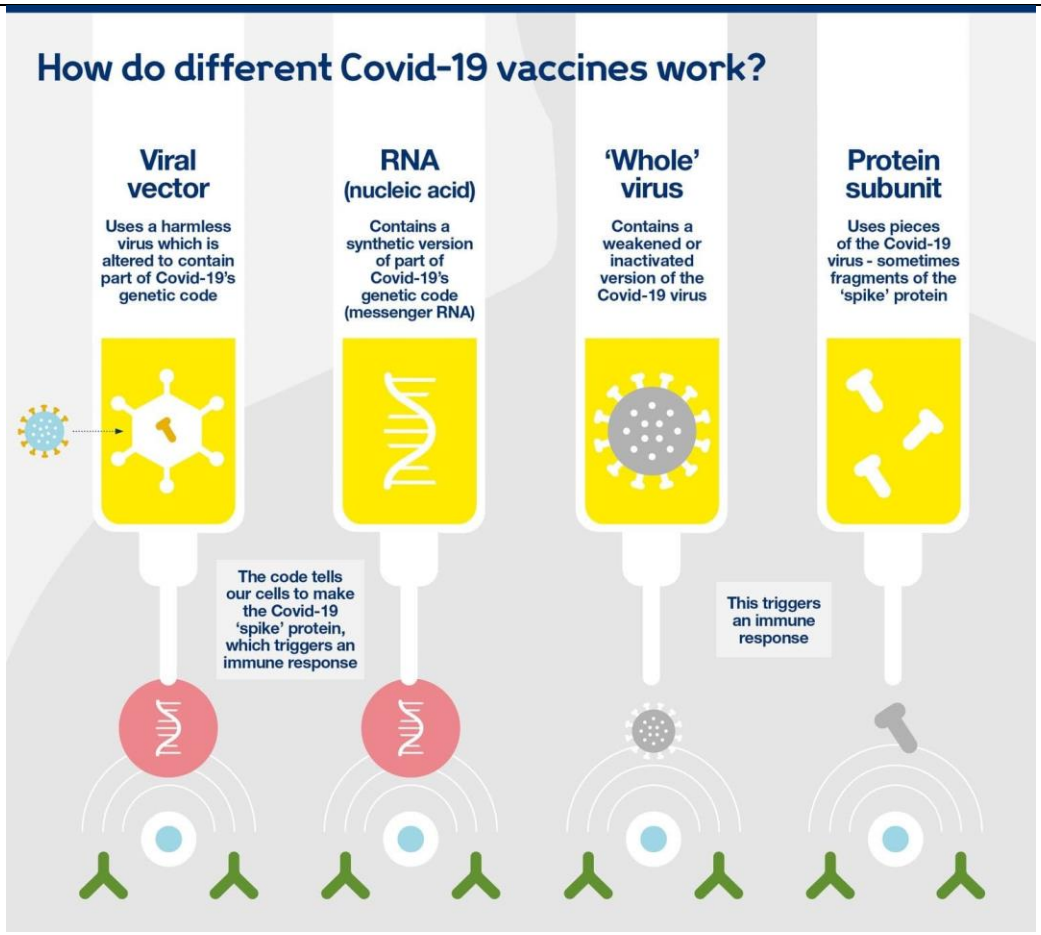
ICMR's Response to the BHU's Study:

- The Indian Council of Medical Research (ICMR) has distanced itself from the Banaras Hindu University (BHU) researchers.
- The ICMR said that the BHU's study was poorly designed with critical flaws.

- The ICMR said the body has not provided any financial or technical support for the research.

Covaxin:

- Covaxin is **India"s indigenous** COVID-19 vaccine developed by Bharat Biotech in collaboration with the Indian Council of Medical Research (ICMR) - National Institute of Virology (NIV).
- The vaccine is developed using **Whole-Virion Inactivated Vero Cell** derived platform technology.
- It is an **"inactivated" vaccine** that uses the **dead virus**.
- It is incapable of infecting people but still able to instruct the immune system to mount a defensive reaction against an infection.
- It is a 2-dose vaccination regimen.
- It is a vaccine with no sub-zero storage and is stable at 2-8 ℃.
- The efficacy against COVID-19 disease is shown to be **81%.**
- It has proven to neutralize the variants – Alpha, Gamma, Zeta, Kappa, Beta and Delta.



Guillain-Barré syndrome (GBS):

- Guillain-Barré syndrome (GBS) is a rare disorder where the body's immune system damages nerve. The damage to the nerves causes muscle weakness and sometimes paralysis. While its cause is not fully understood, the syndrome often follows infection with a virus or bacteria.

What are the stages of testing vaccines?

- Vaccines are meant to follow a testing process of **four stages**
- **Pre-Clinical**- In this phase medical professionals use cell or tissue culture systems and animal testing to determine whether the candidate vaccine will produce immunity.

- **Clinical Development**- Now, a sponsor, usually a private company, applies for approval of the vaccine.
- Once the proposal has been approved, the candidate vaccine needs to **three trial stages of human testing.**
- **Phase I**- A small group of people is injected with this candidate vaccine to determine how safe it is and to learn more about the responses it provokes among test subjects.
- **Phase II**- A group of more than hundreds of human test subjects are injected to determine more information about immunogenicity, safety, dose size, and immunization schedule.
- **Phase III**- In this phase, more than thousands of human test subjects are injected to determine rare side effects which sometimes don't appear in smaller groups.
- **Regulatory review and approval**- Once a vaccine passes all the phases, the vaccine developer submits a license application to the regulatory authority.
- **Quality control**- The firm has to continue monitoring the use of its vaccine on patients and submit post-marketing surveillance details, which checks for any long-term unintended adverse effects.

Researchers from the University of Cambridge have developed a pioneering zero-emission cement production method.

Zero-Emission Cement:

- Zero-emission cement refers to cement produced using methods that **eliminate greenhouse gas emissions** throughout the production process, primarily by recycling materials and utilizing renewable energy-powered technologies.
- Cement production is a major contributor to global greenhouse gas emissions, responsible for about **8% of total emissions**.

- Traditional cement production involves **creating "clinker,"** which requires heating **limestone** and other raw materials to 1450°C. This process **contributes 90% of the cement"s carbon footprint.**
- The conventional method includes superheating limestone in kilns, typically powered by burning fossil fuels, and the limestone itself releases significant CO2 when heated.
- The new method **repurposes cement paste** from demolished buildings and employs an electric arc furnace—traditionally used in steel recycling—to produce clinker.
- This innovative approach modifies the steel recycling process to create cement without the high carbon emissions associated with traditional methods.
- If these **electric furnaces are powered by renewable energy**, the production process could **achieve zero emissions.**
- This breakthrough could significantly impact the cement industry by providing a low-cost, low-emission cement production method at scale, marking a substantial shift towards achieving carbon neutrality by 2050.
- According to Allwood, this method offers **a "big bright hope"** for reducing concrete"s substantial environmental impact. It surpasses the emissions of entire nations like China and the United States except for their outputs.

Recently, the Central Council for Research in Ayurvedic Sciences (CCRAS) launched "PRAGATI- 2024" (Pharma Research in AyurGyan And Techno Innovation).

PRAGATI-2024:

- PRAGATI-2024 aims to encourage joint research endeavors between CCRAS and the Ayurvedic pharmaceutical industry, fostering innovation and expansion within the Ayurveda domain.

Central Council for Research in Ayurvedic Sciences (CCRAS):

- Central Council for Research in Ayurvedic Sciences (CCRAS) operates as an **independent body** under the **Ministry of AYUSH** (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homeopathy), Government of India.
- **Aim**: Founded in **1978**, its mission is to organize, coordinate, advance, and advocate for research in Ayurveda and the **Sowa-Rigpa medical system using scientific principles.**
- **Objectives**: Conducting studies to scientifically validate the effectiveness of Ayurvedic practices.
- Advancing and popularizing Ayurvedic science through research and educational initiatives.
- Fusing traditional Ayurvedic approaches with modern medicine to enhance overall healthcare services.

Achievements of CCRAS:

- **Ayurvedic Formulation Development**: CCRAS has created numerous significant Ayurvedic formulations and technologies, which have been patented and brought into commercial use.
- **Ayurveda Morbidity Codes**: CCRAS has devised **morbidity codes** and **standardized terminologies** to establish uniformity in Ayurvedic practice.
- **AYUSH Research Portal**: An extensive repository of Ayurvedic research, encompassing data on medications, case reports, and clinical trials.

Prominent Initiatives:

- **Golden Triangle Partnership**: A joint endeavor involving **CSIR** (Council of Scientific and Industrial Research) and **ICMR** (Indian Council of Medical Research) to bolster the scientific verification of Ayurvedic practices.
- **Tribal Health Care Research Program**: Geared towards cataloging ethno-medical wisdom and scientifically validating its efficacy.

AYUSH Medicine System

- AYUSH stands for the various medical systems practiced in India, including **Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy.**
- Evolution of AYUSH: In **1995**, the **Department of Indian Medicine and Homeopathy** was established within the Union Ministry of Health and Family Welfare.
- In 2003, this department underwent a name change to become the **Department of AYUSH**, with a concentrated emphasis on education and research in Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homoeopathy.
- **Establishment of the Ministry of Ayush in 2014**: Aiming to revitalize ancient medical systems' knowledge and facilitate the optimal growth and dissemination of Ayush healthcare systems.

SOCIETY

Alok Shukla, convenor of the Chhattisgarh Bachao Andolan and founding member of the Hasdeo Aranya Bachao Sangharsh Samiti, has been awarded the 2024 Goldman Prize from Asia.

Goldman Environmental Prize:

- The Prize recognizes individuals for sustained and significant efforts to protect and enhance the natural environment, often at great personal risk.
- It is also known as the **Green Nobel**.
- It recognizes grassroots environmental heroes from roughly the world's six inhabited continental regions: Africa, Asia, Europe,Islands & Island Nations, North America and South & Central America
- The Goldman Prize views "grassroots" leaders as those involved in local efforts, where positive change is created through community or citizen participation.

- The first Goldman Environmental Prize ceremony took place on April 16, 1990. It was timed to coincide with **Earth Day**.
- *Hasdeo Aranya region:*
- It is a sprawling forest in the northern part of **Chhattisgarh** which is known for its biodiversity and also its coal deposits.
- The forest falls under Korba, Surajpur and Sarguja districts with sizeable tribal population.
- The **Hasdeo River, a tributary of Mahanadi**, flows through it.
- It is the largest un-fragmented forests in Central India consisting of pristine **Sal (Shorea robusta)** and teak forests.

How the Widal test is clouding India's sense of its typhoid problem.

- The Widal Test's propensity for erroneous results is obfuscating India's typhoid burden, increasing expenses, and risking more antimicrobial resistance.

Widal Test:

- It is a test done for diagnosing typhoid fever.
- Typhoid fever, also known **asenteric fever**, is a bacterial infection caused by the bacterium **Salmonella Typhi**, and it is commonly spread through contaminated food or water.
- A person with typhoid fever will experience symptoms like fatigue, high fever, headache, diarrhoea or constipation, abdominal pain, weight loss, and red spots.
- These symptoms mimic those of malaria, dengue, influenza, and typhus, to name a few, making it difficult to diagnose without proper testing.
- As with other infections, our immune system produces **antibodies** in the blood against the bacteria, causing **enteric fever**.

- The widal test is a **serological test that detects antibodies** against the bacteria in a patient's blood sample, indicating whether or not they have been infected with the bacteria.
- It is used to help diagnose a current or recent infectionor to determine if an individual has had a previous typhoid infection.
- It's a point-of-care test and doesn't need special skills or infrastructure.
- Developed in the late 1800s by a French physician, it is no longer used in many countries because of its flaws .The World Health Organization (WHO)has said that due to the various factors that can influence the results of a Widal test, it is best not to rely too much on this test.

Limitations:

- A single positive Widal test report doesn't necessarily mean a typhoid infection is present, and a negative report doesn't confirm the disease's absence.
- To diagnose an active infection, clinicians must test at least two serum samples taken at least 7-14 days apart, so that they may detect a change in the concentrations of the antibodies. But getting two samples is rarely feasible and time-consuming.
- In areas with a high and continuous typhoid burden, certain levels of antibodies against the bacteria may already be present in the blood. Without knowing the baseline cut-off, it isn't possible to correctly interpret the test.
- The reagents used in the Widal test to reveal the presence of various antibodies can cross-react with antibodies produced against infections by other bacteria, viruses or parasites, or even in typhoid-vaccinated individuals, leading to false positives.
- Prior antibiotic therapy can also affect antibody levels and yield a **false negative**.

Road Ahead:

- Adoption of Best-Practice Strategies: Better point-of-care tests need to be discovered that can replace the Widal test.

- Until they're available, clinicians can use best-practice strategies that provide a rational diagnosis and subsequent treatment options based on the regional data of effective antibiotics available against the bacteria.
- These options should be coupled with ensuring adequate and safe food and water and functional sanitation to address the disease's root cause.

Global Report on Internal Displacement.

- In 2023, the number of internally displaced people increased to 75.9 million, from 71.1 million in the preceding year, according to the Global Report on Internal Displacement 2024 (GRID-2024) released recently.
- Global Report on Internal Displacement 2024:
- It is an annual report published by the Geneva-based Internal Displacement Monitoring Centre (IDMC).
- It records internal displacements due to conflict and violence and disasters.

Highlights of GRID-2024:

- In 2023, the number of internally displaced people (IDP) increased to75.9 million, from 71.1 million in the preceding year.
- Report says 7.7 million displaced by disasters (one-fourth of it was caused by earthquakes) and 68.3 million by conflict and violence.
- **Sudan, Syria, the Democratic Republic of the Congo (DRC), Colombia, and Yemenhost nearly half of the world's IDPs.**
- At **9.1 million, Sudan** has the highest number of IDPs recorded for a single country.
- Most of the new displacement this year happened in Sudan, **the Palestinian territories**, and the Democratic Republic of Congo, accounting for almost two-thirds of all new displacement.

South Asia:

- The IDMC said around 5.3 million people were living in internal displacement as a result of conflict and violence across South Asia at the end of 2023, 80 percent of whom were in Afghanistan.
- Conflict and violence triggered **69,000 displacements in South Asia in 2023**, with **Manipur violence** alone accounting for 67,000.
- *It is the highest number of displacements triggered by conflict and violence in India since 2018*.
- There is a sharp decline in IDP in 2023 from 2.5 million internal displacements due to natural disasters in India in 2022. Internal displacements by natural disasters in 2023 was 528,000.

Key Facts about Internal Displacement Monitoring Centre (IDMC):

- It is the leading source of information and analysis on internal displacement.
- IDMC defines internal displacement as "the number of forced movements of people within the borders of their country recorded during (a) year.
- IDMC was set up in **1998** at the request of the international community to fill an important knowledge gap on the global scale and patterns of internal displacement.
- **IDMC is part of the Norwegian Refugee Council (NRC)**, an independent, non-governmental humanitarian organisation.
- IDMC plays a unique role as a global monitor and evidence-based advocate to influence policy and action by governments, UN agencies, donors, international organisations and NGOs.
- IDMC's GRID is the official repository of data and analysis on internal displacement.

Muria tribes' own eco-friendly, foolproof seed preservation method

- Internally displaced tribal families in the Godavari Valley persist in employing the ancestral 'deda' method to conserve seeds of pulses and food crops, inherited from their ancestors in Chhattisgarh.

Deda Method:

- **Storage of seeds**: The seeds are stored within leaves and tightly packed to resemble boulders when viewed from a distance.
- These packaged seeds are then encased in **Siali leaf** (**Bauhinia vahlii**), locally referred to as 'addakulu', to create the deda.
- **Three-Layer Seed Preservation**: Each deda consists of three layers. Initially, wood ash is scattered within the Siali leaves.
- Then, lemon leaves are used to encase the ash, forming a protective layer. Finally, the seeds are stored inside this casing and sealed.
- Each deda is designed to accommodate a minimum of 5kg of seeds.
- Advantages of Deda Method: The Deda method ensures that seeds are shielded from pests and worms, allowing them to be viable for cultivation for up to five years.
- This technique is particularly effective for preserving pulses such as **green gram**, **red gram, black gram, and beans.**

Muria Tribes:

- **Geographical Location**: Telangana, Andhra Pradesh, Chhattisgarh, and Odisha.
- They communicate in **Koya**, a Dravidian language.
- Settlements: Muria settlements are recognized as homes to **Internally Displaced People** (IDPs), numbering approximately 6,600 in Andhra Pradesh.
- They are commonly referred to as **'Gutti Koyas'** by the indigenous tribes.
- Gutti Koyas were granted Scheduled Tribes Status in Chhattisgarh, *But Not in Telangana.*
- **Muria Farming Practices** : The Muria tribes engage in **subsistence farming**.
- **Small-Scale Mixed Crop Farming**: The Murias typically cultivate mixed crops on small-scale plots measuring below half an acre.

- Maize and pulses are their primary crops, with minimal reliance on paddy. Paddy cultivation employs the direct-sowing method.

Internally Displaced People (IDP):

- Internally Displaced People (IDP), as defined by the **Guiding Principles on Internal Displacement**, refer to individuals or groups compelled to flee their homes or habitual residences due to factors such as armed conflict, widespread violence, human rights abuses, natural disasters, or human-made calamities.
- These individuals have not crossed an internationally recognized border.

THE 77TH WORLD HEALTH ASSEMBLY: A DECISIVE MOMENT FOR THE FUTURE OF GLOBAL HEALTH COOPERATION

- Between May 27 and June 1, ministers of health and other decision-makers from all 194 Member States of the World Health Organization (WHO) will gather for the **77th World Health Assembly**, the annual meeting of the WHO's decision-making body.

- A range of global health issues will be discussed at WHA77: defeating polio, malaria, HIV, and other diseases; increasing access to universal health coverage and immunization; countering growing antimicrobial resistance; and ensuring better maternal and reproductive health outcomes.

- A package of amendments will be on the agenda of the upcoming World Health Assembly (WHA) meeting.

Proposed Amendments to IHR and New Pandemic Agreement :

- **Amendments to IHR**: These amendments to the **International Health Regulations** (IHR) will target improving the ability of countries to respond to public health emergencies of international concern.

- **International Agreement on Pandemic Management**: This process has been running in parallel to develop an international agreement on pandemic prevention, preparedness, and response.
- **Building capacities**: A potential new pandemic agreement and the amended IHRs would be complementary international instruments designed and negotiated by Member States to help countries protect their peoples better from future pandemic threats.
- The IHR focuses on building countries' capacities to detect and respond to public health events, which could take on international dimensions.
- On the other hand, the draft pandemic accord focuses on a coordinated international response to pandemics, with equitable access to vaccines, therapeutics, and diagnostics at the centre.
- **World Health Assembly (WHA):**
- It is the **decision-making body** of WHO. It is attended by delegations from **all WHO Member States** and focuses on a specific health agenda prepared by the Executive Board.
- The Health Assembly is held annually in **Geneva, Switzerland**.

Mandate:

1. Determine the policies of the Organization
2. Appoint the Director-General
3. Supervise financial policies
4. Review and approve the proposed programme budget.

International Health Regulations (IHR):

- The International Health Regulations (IHR) first adopted by the **WHA in 1969** and last revised in 2005, were conceived to maximize collective efforts to manage public health events while minimising disruption to travel and trade.

- **Members**: There are 196 State Parties to the IHR comprising all 194 WHO Member States, plus Liechtenstein and the Holy See.
- **India is a signatory** to the International Health Regulations.
- **Aim**: The IHR provides an overarching legal framework that defines countries' rights and obligations in handling public health events and emergencies that have the potential to cross borders. It **is legally binding** on 196 countries.
- They introduce important safeguards to *protect the rights of travellers and other persons in relation to the treatment of personal data, informed consent and non-discrimination in the application of health measures under the Regulations*.
- **Surveillance systems**: The International Health Regulations (IHR) mandate that all countries establish surveillance systems capable of:

1. promptly detecting acute public health incidents
2. assessing their severity
3. reporting potential public health emergencies of international concern to the WHO
4. responding to public health risks and emergencies.

Need for Amendments:

- **Strengthening Responses**: The management of multiple public health emergencies, including the COVID-19 pandemic demonstrated important areas in which they could be strengthened for the benefit of all 196 State parties.
- **Global Collaboration for Epidemic and Pandemic Protection**: Countries have come together around improved international mechanisms to protect from the impact of epidemics and pandemics, with a commitment to equity and solidarity.

World No Tobacco Day 2024

- World No Tobacco Day was created in 1987 by Member States of the World Health Organisation (WHO). 31st May is celebrated as the World No Tobacco Day

- **Theme**: The theme of World No Tobacco Day 2024 is "Protecting children from tobacco industry interference" to protect future generations and ensure that tobacco use continues to decline.
- Tobacco is a major preventable cause of disease, impacting nearly 26 crores Indians and 60 lakh industry workers, and posing significant health risks.

Status of tobacco use in India

- **Global Adult Tobacco Survey (GATS)**: It indicates a general decline in tobacco use among adults aged 15 and older, with the exception of an increase among women between 2015-2016 and 2019-2021.
- **Decline in Youth Tobacco Use**: The **Global Youth Tobacco Survey (GYTS)** shows a decrease in tobacco use among students aged 13-15 years.
- **NFHS Data**: The National Family Health Survey (NFHS), which records tobacco usage data for individuals aged 15 and above, mirrors the findings of the Global Adult Tobacco Survey (GATS) by indicating a decline in tobacco consumption overall, with the exception being among women.

WHO Framework Convention on Tobacco Control (FCTC)

- The WHO Framework Convention on Tobacco Control (WHO FCTC) is **the first international treaty** negotiated under the auspices of WHO which was adopted by the **World Health Assembly in 2003**.
- **Ratification by India**: India ratified the WHO Framework Convention on Tobacco Control (WHO FCTC) in 2004, the first ever international public health treaty focusing on the global public health issue of tobacco control.

Objective:

1. Price and tax measures to reduce the demand for tobacco.
2. Non-price measures to reduce the demand for tobacco

3. Protection from exposure to second hand tobacco smoke.
4. Tobacco content and product regulation

Steps taken by Government to Limit Tobacco Use:

- **Cigarettes and Other Tobacco Products Act (COTPA):** The Cigarettes and Other Tobacco Products Act (COTPA), 2003, superseded the Cigarettes Act of 1975, expanding its scope beyond cigarettes to include various tobacco products like cigars, bidis, chewing tobacco, and pan masala.
- **National Tobacco Control Program (NTCP):** It was launched in 2007 and is designed to improve the implementation of COTPA and FCTC, improve awareness about the harms of tobacco use, and help people quit it.
- **mCessation**: It is India's mobile-based tobacco cessation initiative, launched in 2016 as part of Digital India.
- It employs text messaging for interactive support between users seeking to quit tobacco and program specialists.

ART AND CULTURE

UNESCO's Register added three significant Indian literary works at the 10th meeting of the Memory of the World Committee for Asia and the Pacific (MOWCAP).

- Three Indian literary works included in **UNESCO's Memory of the World Regional Register**
- Three literary works include the **'Ramcharitmanas', 'Panchatantra', and 'Sahrdayaloka-Locana'.**

Ramcharitmanas:

- Written by **Goswami Tulsidas** in the **16th Century**, Ramcharitmanas is a profound retelling of the Ramayana.

- It is composed in the **Awadhi dialect**, making it accessible to a broader audience of that era.
- The text is divided into **seven parts**, each referred to as a Kānda, covering various phases of Lord Rama's life.
- Themes of Ramcharitmanas focus on devotion, dharma, and the ideal behaviors expected of individuals.
- It significantly contributed to the Bhakti movement in Hinduism, emphasizing personal devotion to God.
- Ramcharitmanas continues to influence Indian culture, notably through the annual staging of Ramlila plays.

Panchatantra:

- Attributed to **Pt. Vishnu Sharma** and penned around the **3rd century BCE**, the Panchatantra is a cornerstone of Indian fables.
- Originally composed in Sanskrit, the work is renowned for its **'story within a story'** structure.
- The Panchatantra consists of five parts or tantras, each featuring a main story intertwined with multiple fables.
- Its central theme is nīti, which teaches wise conduct of life, focusing on morals and ethics tailored for young rulers.
- The text is one of the oldest collections of Indian fables and is among the most translated from India, influencing various global literary traditions.
- The use of animals with human traits in Panchatantra explores complex human behaviors and societal issues.

Sahrdayāloka-Locana:

- Written by **Acharya Anandvardhan** and commented upon by philosopher **Abinava Gupta**, this text is a seminal work in Indian poetics.

- Composed in Sanskrit, Sahrdayāloka-Locana delves into the aesthetic appreciation of art and literature.
- It focuses on the concept of rasa, which are emotional flavors key to evoking specific feelings in the audience through literary or artistic works.

PM Modi offers prayers at Jagannath temple in Puri

Jagannath Temple:

- The Jagannath Temple is located in **Puri**, Odisha.
- It is dedicated to Lord Vishnu and his incarnations as **Jagannath**, along with his siblings**, Lord Balabhadra** and **Devi Subhadra**.
- **Construction and Architecture:**
- The temple was initially built by **Anantavarman Chodaganga Deva** between **1112-1148 AD** and later completed by **Anangabhima Dev**.
- Its construction was reconstructed starting from the 10th century by King **Indradyumna of Avanti.**
- Anantavarman was the first ruler of the **Eastern Ganga dynasty**.
- The Jagannath Temple reflects the **Kalinga school of architecture**, which is a variant of the **Nagara school**. It is noted for its high platform and the unique aspect that its shadow does not fall on the ground at any time of the day.
- **Cultural and Religious Importance:**
- The temple is recognized as one of the **Char Dham pilgrimage sites**, which is essential for Hindu devotees.
- It is also part of the Vaishnavate tradition"s **108 Abhimana Kshethram.**
- **Idols and Iconography:**
- The main deities, Jagannath, Balabhadra, and Subhadra, are uniquely made out of wood at this temple.

- These wooden idols are periodically replaced **every twelve or nineteen years** in a ritual known as **Navakalevara.**
- **Festivals and Practices:**
- The temple hosts significant festivals like **Devasnana Purnima** and the **Rath Yatra (Chariot Festival).**
- During the Rath Yatra, the idols are paraded in massive, ornately decorated temple chariots.
- Worship during the Rath Yatra is uniquely conducted by **Bhil Sawar**, a **tribal priest**.

A portion of the Virupaksha temple in Karnataka collapsed due to torrential rains recently.

- The temple's pavilion or the **saalu mantap** was damaged as a section of pillars holding it collapsed.
- Three metres of the 19-metre-long pavilion, consisting of four pillars, are damaged due to heavy rain.
- Reason: The pavilion was constructed using stone pillars and were subject to very heavy rains in the past, due to which foundation of the pavilion lost its strength gradually, leading to the collapse.

Virupaksha Temple:

- **Origin and Evolution**: The Virupaksha Temple originated in the **7th century AD**, making it the **oldest and principal temple in Hampi**.
- It gained prominence and underwent extensive expansion in the form of the present temple complex during 14th century under the patronage of **Vijayanagara Empire (1336 to 1646).**
- **Presiding Deity: Lord Shiva**.
- **Built by**: This temple complex was constructed by **Lakkan Dandesha**, a nayaka (chieftain) of the ruler, **Paruda Deva Raya II** during the Vijayanagara rule.

- **Location**: The temple is located located on the south **bank of the river Tungabhadra**, in Hampi, Vijaynagara district, Karnataka.
- **UNESCO Recognition**: It belongs to the Group of Monuments at Hampi, declared as a UNESCO World Heritage Site.

Virupaksha Temple Features:

- It is also known as the **Pampapathi temple** and is the oldest temple in Hampi. The main temple is east facing and has two large courtyards, one leading to the other.
- **Mathematical Construction**: The Temple's construction and decoration shows repeated patterns which depict the concept of **fractals**. The temple is triangular in shape.
- **Ranga Mandapa**: **Krishnadevaraya** was instrumental in building the central pillared hall (Ranga Mandapa) in **1510 AD** and the gateway tower, which provides access to the inner courtyard of the temple.
- **Annual Chariot Festival**: The month of December witness the betrothal and marriage ceremonies of **Lord Virupaksha and Goddess Pampa** with the annual Chariot festival held.
- **Architecture Style: Dravidian temple architecture,**
- It is characterised by grand gopurams (towering gateways) depicting various deities, mythological scenes and animals, the shikhara towering over the sanctum sanctorum, and the intricate carvings and pillared halls, an enclosed wall compound and water reservoir.

Nation celebrates Ahilyabai Holkar's 300th birth anniversary

- Maratha queen Ahilya Bai Holkar — a great administrator and visionary with a spiritual inclination.

Ahilya Bai Holkar:

- Ahilya Bai Holkar, a great Maratha queen. She was born on May 31, 1725 to a shepherd family in Ahmednagar, Maharashtra. Strived to be recognized as a leader in her own right, beyond being the wife of **Khande Rao Holkar**.
- **Leadership and Governance**:
- Took over as monarch after her husband's death, breaking patriarchal norms.
- Led her kingdom to 30 years of peace and financial stability.
- Appointed **Tukoji Holkar** as the commander of her army to ensure effective military leadership.
- Guided by innate generosity and principles in her dealings with subjects.
- **Cultural and Religious Contributions**:
- Regularly attended Purana recitals and **yagnas** to uphold her Hindu faith.
- **Resurrected jyotirlingas** across the country as a tribute to Lord Shiva.
- Renovated temples in Somnath, Varanasi, Trambak, Gaya, Pushkar, Vrindavan, Nathdwara, Haridwar, Badrinath, Kedarnath, and others.
- Installed idols in secret shrines for protection against attacks and iconoclasm.
- **Economic and Social Initiatives**:
- Promoted the production of **Maheshwari saris,** empowering women and providing steady income for weavers.
- Enhanced revenue collection and supported traditional crafts in Maharashtra.
- Developed Indore, conserved forests and animals, and boosted trade and commerce.
- **Inclusivity and Social Harmony**:
- Celebrated inclusivity and promoted social harmony among her subjects. Worked towards mainstreaming **Bhil and Gond castes**.

Legacy and Recognition:

- Commanded respect from contemporaries and later historians like **Jadunath Sarkar, Annie Besant, and John Keay.**

- Her contributions to governance, social harmony, and temple renovation are significant.
- Ahilya Bai Holkar's rule exemplifies inclusive policymaking and effective governance. Her legacy is a blueprint for Ram Rajya in today's era, transcending gender norms and biases.

Birth anniversary of Kartar Singh Sarabha was recently celebrated.

Kartar Singh Sarabha:

- An Indian revolutionary, born on **24 May 1896** in Village Sarabha, Ludhiana.
- Nicknamed **"General" by Sohan Singh Bhakna**, President of the **Ghadar Party**.

Key Contributions:

- Became a member of the Ghadar Party (founded in **Oregon** in 1913) and edited the Urdu version of Ghadar into Gurmukhi script.
- Delivered pistols and ammunition to the Ghadar Party President for attacking the British, involved in the **Komagata Maru incident**.
- Charged in the **First Lahore Conspiracy Case** and executed in 1915 along with compatriot **Vishnu Ganesh Pingle.**

Honour:

- In 2020, the Punjab Government renamed Ludhiana-Pakhowal Road to Shaheed Kartar Singh Sarabha Marg.