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UPSC – PRE 2025

**(YEARLY CURRENT
AFFAIRS)**

JUNE 2024-DEC 24

Shrinkflation:

Why in News ? South Korean government has ordered the companies that if they are doing Shrinkflation then they have to mention it clearly on product label for 3 months. Otherwise, Government will impose penalty.

Shrinkflation is a sneaky way for manufacturers to raise prices without explicitly increasing the price tag.

How it works?

The Scam: Manufacturers reduce the quantity of a product while keeping the price the same (or maybe even raising it slightly). This means you get less for your money.

Sneaky Strategy: The hope is that you won't notice the smaller size, especially if the packaging remains similar. This makes it difficult to compare prices accurately between different purchases.

Examples of Shrinkflation:

Fewer chips in the bag: You might notice your favorite potato chip bag seems somehow lighter. Maybe there's more air inside, or the bag itself has shrunk a bit. This means you're getting fewer chips for the same price.

Shorter toilet paper rolls: The toilet paper roll might look the same size, but it's actually shorter, offering fewer sheets. This translates to needing to buy replacements more often.

Smaller cereal boxes: The familiar cereal box might have gotten a little slimmer, containing less cereal but still costing the same amount.

Impacts of Shrinkflation:

Reduced Value: You're essentially paying more per unit of the product (by weight or volume) because you're getting less.

Hidden Costs: Shrinkflation can strain your grocery budget as you need to buy more of the same product to get the same amount you used to.

Challenges for Consumers: It requires more vigilance to compare prices effectively and avoid getting tricked by the seemingly unchanged price tags.

How to Spot Shrinkflation:

- **Check the Unit Price:** Pay attention to the price per unit (ounce, gram, etc.) listed on the shelf tag, not just the overall price. This allows for a more accurate price comparison between different brands or package sizes.
- **Compare Package Sizes:** Notice any changes in the size or weight of the product over time.

- **Be Mindful of "Value Packs":** Sometimes larger packages might seem like a better deal, but do the math per unit price to ensure you're actually getting more for your money. By staying informed about shrinkflation tactics, you can be a more conscious shopper and make informed choices when it comes to your groceries and other consumer products.

What is Chip 4" or "Fab 4?

The "Chip 4" or "Fab 4" alliance is a group of countries aiming to cooperate on semiconductor (chip) production and supply chains.

Members:

- The alliance consists of the United States, Japan, South Korea, and Taiwan.
- These countries are powerhouses in the semiconductor industry:
- The US has major **chip design companies like Intel, AMD, and Nvidia.**
- Japan is a leader in chipmaking materials and equipment.
- South Korea boasts memory chip giants like Samsung and SK Hynix.
- Taiwan is home to the **world's largest contract chip manufacturer, TSMC.**

Goals:

- The primary objective is to strengthen the global semiconductor supply chain and reduce reliance on any single country (often seen as an allusion to China).
- This includes:

Boosting domestic chip production: The alliance aims to encourage member countries to invest in building more chip fabrication plants (fabs) within their borders.

Collaboration on research and development (R&D): Working together to develop next-generation chip technologies.

Securing critical materials and equipment: Ensuring a stable supply of raw materials and equipment needed for chip production.

Protecting intellectual property (IP): Safeguarding the intellectual property rights of member countries' chip companies.

Benefits:

- **Enhanced Security:** A more diversified chip supply chain could lessen the risk of disruptions caused by geopolitical tensions or natural disasters.
- **Technological Advancement:** Collaboration on R&D could accelerate innovation in the semiconductor industry.
- **Economic Growth:** Increased domestic chip production can create jobs and boost the economies of member countries.

Challenges:

- **Geopolitical Tensions:** Navigating complex geopolitical relationships between member countries, particularly regarding China.
- **Balancing Competition and Collaboration:** Member countries are also competitors in the chip market, so striking a balance between cooperation and competition is crucial.
- **Implementation:** Translating goals into concrete actions and ensuring all members are committed to the alliance's objectives.

Current Status:

- The alliance is still in its early stages. The first official meeting of senior officials was held in September 2022.
- The success of the Chip 4 alliance will depend on the member countries' ability to overcome these challenges and effectively implement their collaborative efforts.

Overall, the Chip 4 alliance represents a significant development in the global semiconductor industry. Whether it can achieve its goals of a more secure and resilient supply chain remains to be seen.

Colombo Process :

Why in News? India has become chair of the Colombo Process for the first time since its inception in 2003.

- The Colombo Process is a regional forum for Asian countries that send migrant workers abroad. It provides a platform for these countries to:
- Share experiences and best practices on managing overseas employment and contractual labor.
- Discuss issues faced by migrant workers and both sending and receiving countries.
- Develop solutions to improve the well-being of migrant workers, especially vulnerable ones.

About the Colombo Process:

- India has been a member of the Colombo Process since its inception in 2003.

Membership:

- The Colombo Process comprises **12 member states from Asia**, all considered origin countries for migrant workers. These include Afghanistan, Bangladesh, China, Cambodia, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam.

Functioning:

- The Colombo Process is a non-binding consultative process, meaning there are no enforced rules or regulations. Decisions are made through consensus among member states.
- **The International Organization for Migration (IOM)** acts as the Secretariat of the Colombo Process, providing logistical and technical support.
- Ministerial Consultations are the key decision-making events, where **member states' ministers discuss and adopt recommendations and action plans.**

- Senior Officials Meetings are held between Ministerial Consultations to prepare for them and ensure recommendations are finalized for adoption.

Thematic Focus:

- **Skills and Qualification Recognition Processes:** Ensuring migrant workers' qualifications are recognized in destination countries.
- **Fostering Ethical Recruitment Practices:** Protecting migrant workers from exploitation during the recruitment process.
- **Pre-departure Orientation and Empowerment:** Equipping migrant workers with knowledge and skills before they go abroad.
- **Promoting Cheaper, Faster, and Safer Transfer of Remittances:** Making it easier and cheaper for migrant workers to send money back home.
- **Labor Market Analysis:** Understanding labor market trends in destination countries to better prepare migrant workers.

Other key facts:

- The Colombo Process also integrates four cross-cutting themes into its work: gender equality, social protection, good governance, and data collection and utilization.
- Since its inception in **2003**, the **Colombo Process** has expanded to include observer states, primarily destination countries for migrant workers in the Gulf region.
- The **Colombo Process** plays a **significant** role in advocating for the well-being of migrant workers from Asian countries. It provides a platform for collaboration and knowledge sharing to ensure migrant workers are protected and empowered.

Subsidiary Bodies (SB60):

Why in News ? Subsidiary Bodies (SB60), formally called the 60th meetings of the Subsidiary Bodies, is a crucial event under the umbrella of the United Nations Framework Convention on Climate Change (UNFCCC).

- It's essentially a preparatory meeting held biannually in June, with another session coinciding with each annual Conference of the Parties (COP) to the UNFCCC.
- National delegates and civil society representatives will make up a significant part of the around 6,000 participants expected to attend the meetings.
- The meeting will serve as a crucial midpoint between the 28th CoP in Dubai and CoP29 in Azerbaijan and its outcomes will set the stage for the next phase of global climate negotiations.

Structure:

SB60 consists of two main bodies:

Subsidiary Body for Scientific and Technological Advice (SBSTA): This body bridges the gap between scientific findings and policy needs. They analyze scientific reports, particularly those from the

Intergovernmental Panel on Climate Change (IPCC), to advise policymakers on actions to address climate change.

Subsidiary Body for Implementation (SBI): This body focuses on the practicalities of implementing the UNFCCC, including the Kyoto Protocol and the Paris Agreement.

- Their role is to oversee countries' progress on their commitments, reviewing their actions and ensuring they meet transparency and reporting requirements.

Importance of SB60:

- **Prepares the Ground for COP:** The discussions and recommendations formulated at SB60 pave the way for more productive negotiations during the subsequent COP meeting.
- They identify key issues, areas of contention, and potential solutions to be addressed by world leaders at COP.

Technical and Scientific Focus: SB60 delves deeper into the technical and scientific aspects of climate change. Experts discuss challenges, explore innovative solutions, and provide evidence-based recommendations to policymakers.

Implementation and Transparency: SBI, a key part of SB60, ensures countries are implementing their commitments effectively. This includes standardizing reporting methods to facilitate transparency and tracking progress towards global climate goals.

Gudleppa Hallikeri Award 2024:

- Poet and playwright Siddhalinga Pattanashetti has been chosen for the prestigious Gudleppa Hallikeri Award for 2024 by the **Gudleppa Hallikeri Memorial Foundation**.

About Guldeppa Hallikeri:

- Indian freedom fighter Gudleppa Hallikeri (1906–1972) was a native of Hosaritti, in the Haveri district of the state of Karnataka.
- In Hosaritti, he founded the Gandhi Grameena Gurukul, a residential school. Hallikeri used nonviolent protests and peace demonstrations to collaborate with numerous other liberation fighters, including Mailara Mahadevappa, Sanikoppa, and Mahatma Gandhi.

Gudleppa Hallikeri Award:

- The Gudleppa Hallikeri Award honors those who have made significant achievements to literature, society, or social service.
- It bears the name of Gudleppa Hallikeri, a well-known liberation warrior who shared Mahatma Gandhi's beliefs.

Capital Account liberalisation

Why in News: Gearing up to remain “future-ready for India’s fast-growing economy”, the Reserve Bank of India (RBI) has listed a series of aspirational goals, including capital account liberalisation and

internationalisation of the Indian rupee (INR), universalising of digital payment system and globalisation of India's financial sector in a multi-year timeframe.

Liberalizing Capital Account in the Indian Economy:

- India has been following a gradual approach to liberalizing its capital account, which refers to the freedom of capital to flow in and out of the country. This approach balances potential benefits with managing risks.

Why Consider Liberalization?

Access to Foreign Capital: It can attract foreign direct investment (FDI) which brings in technology, expertise, and funds for infrastructure development. It can also attract portfolio investments that increase liquidity in the financial markets.

Improved Efficiency: By integrating with global financial markets, Indian companies can access cheaper funds and investors can get better returns.

Signaling Effect: A more open capital account can be seen as a sign of a strong and stable economy, attracting more foreign investment.

Positive Impacts Economic Growth: Increased access to capital can lead to higher investment, job creation, and economic growth.

Exchange Rate Stability: Foreign capital inflows can help stabilize the exchange rate by increasing the supply of foreign currency.

Financial Market Development: Integration with global markets can lead to a wider range of financial products and services for Indian investors.

Negative Impacts:

Exchange Rate Volatility: Large capital inflows or outflows can lead to sharp fluctuations in the exchange rate, impacting exporters and importers.

Financial Crises: Sudden capital flight (investors pulling out money) can trigger financial crises.

Asset Price Bubbles: Easy access to foreign capital can inflate asset prices (like stocks or real estate) creating bubbles that can burst later.

The Indian Approach:

- India has taken a cautious approach, gradually relaxing restrictions on foreign investments while maintaining controls on short-term capital flows. This helps manage potential risks like exchange rate volatility and financial crises.
- The **Reserve Bank of India (RBI)** constantly monitors and regulates capital flows to ensure financial stability.

What is Capital Account?

- The capital account refers to the part of a country's balance of payments that tracks non-trade related transactions. These transactions involve the movement of capital, such as:

Foreign direct investment (FDI) - Investments in businesses or assets with the intention of controlling or influencing them.

Portfolio investment - Buying and selling of stocks, bonds, and other financial instruments.

Loans - Borrowing or lending money between residents and non-residents.

What is Capital Account Convertibility (CAC)?

- Capital account convertibility refers to the freedom to convert a country's domestic currency into foreign currency, and vice versa, for capital account transactions. In simpler terms, it allows for the free flow of capital in and out of the country.

There are two main types of convertibility:

Full convertibility: Permits unrestricted conversion of domestic currency for both current and capital account transactions.

Partial convertibility: Allows conversion for some, but not all, types of capital account transactions.

The Tarapore Committee and CAC in India:

- The Reserve Bank of India (RBI) set up the Tarapore Committee in 2006 to examine the feasibility of full capital account convertibility for India. The committee recommended a phased approach towards achieving this goal.

Key points from their report:

Preconditions for CAC: The committee identified certain economic preconditions for successful capital account convertibility, such as low and stable inflation, a strong financial system, and adequate foreign exchange reserves.

Phased Approach: They recommended a three-phase liberalization of capital account transactions, allowing for gradual relaxation of controls.

Benefits and Risks: The report acknowledged the potential benefits of CAC, such as attracting foreign investment and boosting economic growth. However, it also cautioned about the risks, like exchange rate volatility and potential for capital flight (sudden outflow of capital).

Current Status:

India has been gradually liberalizing its capital account based on the Tarapore Committee's recommendations. While significant progress has been made, full convertibility is still not achieved. The RBI continues to manage capital flows to maintain financial stability.

India's new Wetland sites : Nagi and Nakti Bird Sanctuary

Why in News ? India celebrated World Environment Day with the addition of the **Nagi Bird Sanctuary and the Nakti Bird Sanctuary in Bihar** to the global list of important wetlands.

- These newly designated Ramsar sites are man-made reservoirs located in the Jhajha forest range of Jamui district in Bihar. Their catchments feature dry deciduous forests surrounded by hills.
- This takes the number of **Ramsar Sites in the country to 82** covering a total area of 13,32,746.24 hectare.

About Nakti Bird Sanctuary:

- The Nakti Bird Sanctuary was primarily developed for irrigation through the construction of the **Nakti Dam**. Since the dam's completion, the wetland and its surrounding area have provided habitat for over **150 species of birds, mammals, fish, aquatic plants, reptiles, and amphibians**.

- Among them are globally threatened species, including the **endangered Indian elephant** and a **vulnerable native catfish** (wallago attu).
- Designated as a bird sanctuary in 1984, Nakti hosts several migratory species during winter months, with over 20,000 birds congregating, including one of the largest gatherings of **red-crested pochard** (Netta rufina) on the Indo-Gangetic plain.

About the Nagi Bird Sanctuary:

- The **Nagi Bird Sanctuary** formed after the damming of the **Nagi River**, gradually creating water bodies with clear water and **aquatic vegetation**.
- Recognized locally as a **bird sanctuary in 1984**, Nagi is also identified as an Important Bird and **Biodiversity Area (IBA)** by BirdLife International due to its significance for migratory bird species. Threatened migratory species that spend winter at the site include the critically **endangered Baer's pochard** and the endangered **steppe eagle**.

Ramsar Convention on Wetlands:

- It is an international treaty for “the conservation and sustainable use of wetlands”.
- It is also known as the **Convention on Wetlands**.
- It is named after the city of **Ramsar in Iran**.
- The Convention was signed on 2nd of February **1971**.
- The 2nd of February each year is World Wetlands Day.
- Number of parties to the convention (COP) is **171**.
- **India** ratified the convention on **February 1, 1982**.

What is wetland?

- The Convention uses a broad definition of wetlands.
- It includes all lakes and rivers, underground aquifers, swamps and marshes, wet grasslands, peatland, oases, estuaries, deltas and tidal flats, mangroves and other coastal areas, coral reefs, and all human-made sites such as fishponds, rice paddies, reservoirs and salt pans.

Digital Payments Intelligence Platform

Why in news ? The RBI Governor Shaktikanta Das has recently said that the Reserve Bank has decided to set up a **Digital Payments Intelligence Platform** which will harness advanced technologies to reduce payment fraud risks.

- To take this initiative forward, the Reserve Bank has constituted a committee headed by A.P. Hota, former MD & CEO, NPCI, to examine various aspects of setting up a digital public infrastructure for the platform.
- He explained that many frauds occur by influencing unsuspecting victims to make the payment or share credentials.

- While the payment ecosystem (banks, NPCI, card networks, payment aggregators, and payment apps) takes various measures on an ongoing basis to protect customers from such frauds, there is a need for network-level intelligence and real-time data sharing across payment systems.
- “The third edition of our global hackathon, ‘HaRBInger 2024 – Innovation for Transformation’ will be launched with two overarching themes viz., ‘Zero Financial Frauds’ and ‘Being Divyang Friendly’.
- Solutions aimed at enhancing the safety and security of digital transactions with a focus on detecting, preventing and combating financial frauds, as well as prioritising inclusivity for persons with physical disabilities, will be invited as part of HaRBInger 2024.

Pump and Dump Scheme:

Why in news ? The Securities Exchange Board of India’s (SEBI) recently slapped a fine of Rs 7.75 crore on 11 individuals for allegedly operating a ‘pump and dump’ scheme.

About Pump & Dump Scheme?

- A pump and dump scheme is a type of securities fraud that involves artificially inflating the price of a stock through false or misleading information. Perpetrators aim to sell their shares at this inflated price before the price crashes back down to reality.
- **The Pump:** Fraudsters acquire a large stake in a stock, usually a microcap or small-cap company with low trading volume and limited public information. They then use various methods to create a buying frenzy, such as:
 - Spreading false or misleading information about the company's prospects through social media, online forums, or even fake press releases.
 - Hypeing the stock on investment websites or chat rooms.
 - Creating a sense of urgency or scarcity to encourage investors to buy quickly.

The Dump: Once the stock price has been artificially inflated due to the increased buying activity, the fraudsters quickly sell their shares at a significant profit. This selling pressure causes the price to plummet, leaving unsuspecting investors who bought at the inflated price with substantial losses.

Why are pump and dump schemes attractive to fraudsters?

Low risk of detection: They often target small companies with limited public scrutiny.

Potential for high profits: By manipulating the stock price, they can generate significant returns.

Why are pump and dump schemes harmful to investors?

Financial losses: Investors who buy at the inflated price can lose a significant amount of money when the price crashes.

Eroded trust in the market: These schemes undermine investor confidence and make it difficult to distinguish legitimate investment opportunities.

The National Health Claim Exchange (NHCX):

Why in News ? The Health Ministry and the Insurance Regulatory and Development Authority of India (IRDAI) are collaborating to launch the National Health Claim Exchange (NHCX).

About the National Health Claim Exchange (NHCX):

- The National Health Claim Exchange (NHCX) is a digital platform launched by the **National Health Authority (NHA)** in India.
- It aims to revolutionize health insurance claim processing by creating a standardized and secure system for exchanging information between various stakeholders.

Key Objectives:

Faster Claim Processing: NHCX aims to significantly reduce claim processing times by facilitating a paperless and automated exchange of data. **This can lead to quicker reimbursements for patients.**

Enhanced Transparency: The platform promotes transparency by providing a clear audit trail for all claim transactions. This can help **reduce fraud and errors.**

Improved Efficiency: By streamlining the claims process, NHCX can lead to operational cost savings for **insurers, hospitals, and TPAs** (Third Party Administrators).

Standardization: It establishes a standardized format for claims data, eliminating inconsistencies and streamlining communication across the healthcare ecosystem.

Patient Empowerment: NHCX can empower patients by giving them greater visibility into their claims history and status.

Challenges and Issues:

IT Infrastructure & Training: Hospitals and insurance companies need to upgrade their IT infrastructure and train staff to effectively utilize the platform.

Integration & Adoption: Integrating NHCX with existing IT systems can be complex, and convincing all stakeholders to adopt the new system takes time and effort.

Data Security & Privacy: Ensuring the security and privacy of sensitive patient data on the platform is a critical concern. Robust cybersecurity measures are essential.

Standardization Compliance: Achieving complete compliance with NHCX data standards by all stakeholders can be challenging, especially for smaller hospitals.

Overall, the National Health Claim Exchange has the potential to significantly improve the efficiency and transparency of health insurance claim processing in India. However, overcoming the challenges mentioned above is crucial for its successful implementation.

Greedflation

Greedflation refers to a situation where inflation is driven by corporate profit maximization rather than traditional economic factors.

Concept of Greedflation:

- Typically, inflation arises from factors like increased demand, supply chain disruptions, or rising input costs (like raw materials).
- Greedflation suggests companies use periods of inflation as an opportunity to raise prices excessively, beyond what's necessary to cover their own increased costs. This inflates profit margins significantly.

Greedflation in India:

- There's debate about the extent of greedflation in India.
- Some evidence suggests it might be a contributing factor.
- Studies show a significant rise in corporate profits in India, with a portion exceeding what can be explained by rising input costs alone. This points towards increased profit margins.

Potential Impacts:

Hurts Consumers: Excessive price hikes due to greedflation disproportionately affect low-income and middle-class households, reducing their purchasing power and lowering living standards.

Widens Inequality: While inflation can inflate asset values, greedflation primarily benefits the wealthy, further widening the wealth gap.

Market Instability: Sharp price increases fueled by greed can create market bubbles and unsustainable economic conditions, potentially leading to financial crises.

Is it happening in India?

- It's difficult to definitively say greedflation is the sole driver of inflation in India. Other factors like global supply chain issues and the Ukraine war also play a role.

However, the rise in corporate profits alongside inflation suggests it might be a contributing factor requiring monitoring and potential policy responses.

Possible Solutions:

Antitrust Measures: Stronger enforcement of antitrust laws to prevent companies from abusing their market dominance and manipulating prices.

Price Monitoring: Increased government vigilance to identify and address instances of excessive price hikes.

Taxation: Windfall profit taxes on companies experiencing significant profit increases during inflationary periods could help redistribute some of those gains.

Conclusion:

Greedflation is a complex issue, and its presence in the Indian economy is a matter of ongoing debate. However, the possibility deserves attention to ensure inflation doesn't become a tool for corporations to exploit consumers and widen economic disparities.

Kavli Prize-2024:

Why in News? The 2024 Kavli Prize was recently announced. Eight winners were awarded for their contributions to astrophysics, neuroscience, and nanoscience.

- The Kavli Prize is named after Norwegian-American businessman and philanthropist Fred Kavli.

About Fred Kavli:

- The **Kavli Prize** is awarded in honour of Norwegian-American businessman and philanthropist Fred Kavli (1927-2013).
- Born in **Erejsford, Norway**, **Kavli** moved to California in 1956 after getting an engineering degree. In the US, he began working for a company which built high-tech sensors for missiles, becoming its chief engineer within a year.
- In 1958, he started his own enterprise, founding Kavlico. Today, the company is a leading manufacturer of pressure sensors and related systems, which are used in all kinds of industries, from aviation to home appliances.
- Kavlico's pressure transducers (devices which convert pressure into an electric signal) are known for their high accuracy, stability, and reliability.
- In 2000, Kavli sold his company for \$ 340 million, and established the Kavli Foundation, with the aim to support wide-ranging basic research to improve the quality of life for people worldwide. The foundation runs 20 institutes which specialise in astrophysics, **neuroscience, nanoscience, and theoretical physics**.

Nobel comparisons:

- The Kavli Prizes are awarded in three areas: astrophysics, nanoscience and neuroscience — the largest, the smallest, and the most complex.

SIPRI Report 2024:

Why in News? The SIPRI report says China's nuclear arsenal increased from 410 warheads in January 2023 to 500 in January 2024, and it is expected to keep growing.

- India possesses more nuclear weapons than Pakistan, while China has expanded its nuclear arsenal from 410 warheads in January 2023 to 500 by January 2024, according to a report by Stockholm International Peace Research Institute (SIPRI).
- In its analysis, the SIPRI said China's nuclear arsenal increased from 410 warheads in January 2023 to 500 in January 2024, and it is expected to keep growing.

Key Points of the report:

- Nine nuclear-armed nations, including the US, Russia, the UK, France, China, India, Pakistan, North Korea and Israel, continued to modernise their nuclear arsenals, and several of them deployed new nuclear-capable weapon systems in 2023.
- India's "stored" nuclear warheads were 172 in January this year, while the number for Pakistan was 170.
- India slightly expanded its nuclear arsenal in 2023, Both India and Pakistan continued to develop new types of nuclear delivery systems in 2023.
- The SIPRI report said while Pakistan remains the main focus of India's nuclear deterrent, India appears to be placing growing emphasis on longer-range weapons, including those capable of reaching targets throughout China.
- Some 2,100 of the deployed warheads were kept in a state of high operational alert on ballistic missiles, and nearly all of them belonged to Russia or the US. However, for the first time, China is believed to have some warheads on high operational alert.
- Russia and the US together possess almost **90 per cent of all nuclear weapons**.
- Russia is estimated to have deployed around **36 more warheads with operational forces than in January 2023, the watchdog added.**
- The report said China's stockpile of nuclear warheads is still expected to remain much smaller than the stockpiles of either Russia or the US.

About the Stockholm International Peace Research Institute (SIPRI):

- It is an independent international institute dedicated to research on issues of conflict, armaments, arms control, and disarmament.
- It was founded in 1966.
- It is a highly respected institution with a global reputation for its objective and data-driven approach.

Mission:

- Conducts research on security, conflict, and peace.
- Provides policy analysis and recommendations for policymakers, researchers, media, and the public.
- Promotes transparency and accountability in matters of international security.
- Delivers authoritative information on critical issues related to peace and security.

Bio-Bitumen:

Why in News ? India is looking to start large-scale production of bio-bitumen from biomass or agricultural waste, a move that would help reduce imports of the material used for asphaltting of roads while also addressing the persistent issue of stubble burning.

- India currently imports about half of its annual requirement of bitumen and the target is to replace imports with **bio-bitumen over the next 10 years**.
- Bio-bitumen is a sustainable alternative to traditional, petroleum-based bitumen used in asphalt.

What is Bio-Bitumen?

- It is made from renewable resources: Unlike traditional bitumen, which is a by-product of crude oil refining, bio-bitumen is derived from non-petroleum sources.

These can include:

- Vegetable oils (e.g., rapeseed, soybean)
- Synthetic polymers
- Combinations of both

Uses of Bio-Bitumen:

- **Paving roads and highways:** The primary use of bio-bitumen is as a binding agent in asphalt mixtures for road construction. It functions similarly to traditional bitumen, binding together the aggregate materials (**crushed rock, sand, gravel**) to create a durable road surface.
- **Potential for wider applications:** Research is ongoing to explore the use of bio-bitumen in other applications where traditional bitumen is used, such as:
 - Roofing materials
 - Waterproofing membranes
 - Industrial applications where a strong, adhesive binder is needed

Benefits of Bio-Bitumen:

Reduced reliance on fossil fuels: Bio-bitumen production utilizes renewable resources, promoting a more sustainable approach to road construction.

Potentially lower carbon footprint: Depending on the source materials and production methods, bio-bitumen could have a lower environmental impact compared to traditional bitumen.

Improved worker safety: The absence of harmful chemicals in some bio-bitumen formulations might create a safer work environment for construction crews.

\$379 million initiative

Why in News? The governments of Ecuador, India, Kenya, Laos, Philippines, Uruguay, and Vietnam have come together to launch a **\$379 million initiative to combat pollution** from the use of pesticides and plastics in agriculture.

Ecuador, India, Kenya, Laos, Philippines, Uruguay, and Vietnam have joined forces to reduce the environmental impact of the agricultural sector

- Highly hazardous pesticides and plastic waste from agriculture release toxic persistent organic pollutants into the environment, also harming human health
- \$379 million initiative will realign financial incentives to prevent the use of harmful inputs in food production
- Chemicals play a crucial role in farming, with nearly 4 billion tons of pesticides and **12 billion kg of agricultural plastics** used every year.
- Despite their benefits for food yields, these chemicals pose significant risks to human health and the environment.
- As many as 11,000 people die from the toxic effects of pesticides annually, and chemical residues can degrade ecosystems, diminishing soil health and farmers' resilience to climate change. The opening burning of agricultural plastics also contributes to an air pollution crisis that causes one in nine deaths worldwide.
- Highly hazardous pesticides and mismanaged agricultural plastics release toxic **persistent organic pollutants (POPs)** – chemicals which don't break down in the environment and contaminate air, water, and food. These inputs are generally cheaper than sustainable alternatives, giving farmers little incentive to adopt better practices.
- The **Financing Agrochemical Reduction and Management Programme** – or FARM – led by the **UN Environment Programme (UNEP)** with financial support from the Global Environment Facility (GEF), seeks to change that, elaborating the business case for banks and policy-makers to reorient policy and financial resources towards farmers to help them adopt low- and non-chemical alternatives to toxic agrochemicals and facilitate a transition towards better practices.

About FARM:

- The Financing Agrochemical Reduction and Management Programme (FARM) is a \$379 million, five-year initiative to combat agrochemical pollution.
- Funded by the Global Environment Facility, the programme is led by UNEP, with the support of United Nations Development Programme, United Nations Industrial Development Organization and the African Development Bank. Participating countries include Ecuador, India, Kenya, Laos, Philippines, Uruguay, and Vietnam.

About the Global Environment Facility:

- The Global Environment Facility (GEF) is a multilateral fund dedicated to confronting biodiversity loss, climate change, pollution, and strains on land and ocean health.
- Its grants, blended financing, and policy support helps developing countries address their biggest environmental priorities and adhere to international environmental conventions.
- Over the past three decades, the GEF has provided more than \$24 billion in financing and mobilized another **\$138 billion for more than 5,700 national and regional projects**.

About the UN Environment Programme:

- UNEP is the leading global voice on the environment.
- It provides leadership and encourages partnership in caring for the environment by inspiring, informing and enabling nations and peoples to improve their quality of life without compromising that of future generations.

The National Financial Reporting Authority (NFRA):

Why in News? The National Financial Reporting Authority (NFRA) will wrap up its first annual inspection of eight **audit firms** - including the **Big Five**.

About NFRA :

The National Financial Reporting Authority (NFRA) is a crucial regulatory body established under the Companies Act, 2013, in India.

Objectives:

Enhance the Quality of Corporate Financial Reporting: The NFRA strives to ensure that financial reports prepared by companies comply with accounting and auditing standards. This promotes transparency, reliability, and public confidence in financial information.

Regulate Auditing Profession: The NFRA plays a vital role in regulating the audit profession in India. It works to maintain high professional standards and ethical conduct among auditors.

Powers and Functions:

Recommendation and Setting of Standards: The NFRA recommends accounting and auditing standards to the Central Government for approval. These standards set the benchmarks for financial reporting practices.

Monitoring and Enforcement: The NFRA monitors the compliance of companies and audit firms with the accounting and auditing standards. It can take action against non-compliant entities.

Overseeing Quality of Service: The NFRA oversees the quality of service provided by auditors, chartered accountants, and other professionals associated with financial reporting. It can identify areas for improvement and suggest corrective measures.

Investigating Professional Misconduct: The NFRA has the authority to investigate cases of professional misconduct by chartered accountants or audit firms. It can impose penalties such as fines or even debarment from practice.

Promoting Continuous Education: The NFRA can promote and facilitate continuous professional education for auditors and other relevant professionals. This ensures they are updated on the latest standards and best practices.

The NFRA acts as a watchdog, safeguarding the integrity and reliability of financial reporting in India. It contributes to a healthy financial ecosystem by fostering transparency, ethical practices and investor confidence

SHAKTI Scheme

Why in News ? Govt in talks to revamp SHAKTI policy for coal linkage process

What is SHAKTI Scheme ?

The Shakti Scheme, also known as the Scheme for Harnessing and Allocating Koyla (Coal) Transparently in India, is a policy implemented by the Ministry of Power in India.

Key Features:

Transparent Coal Allocation: The scheme aims to move away from an opaque allocation system and introduce a more transparent mechanism for coal linkage to thermal power plants.

Auction-Based System: A key feature is the introduction of auctioning for coal linkages, ensuring a fair and competitive process for all participants.

Fuel Supply Agreements (FSAs): Power plants with Letters of Assurance (LoAs) can sign FSAs after meeting specific milestones and fulfilling all conditions within the stipulated timeframe.

Power Purchase Agreements (PPAs): Coal linkage for future projects will be determined based on competitive bidding of tariffs through Power Purchase Agreements (PPAs).

Objectives:

Ensuring Coal Availability: The primary objective of the Shakti Scheme is to ensure a reliable and transparent supply of coal to thermal power plants across the country. This helps to address issues of power shortages due to coal scarcity.

Optimizing Coal Allocation: The scheme aims to optimize the allocation of coal resources by ensuring it reaches power plants that need it the most.

Promoting Efficiency: By introducing competition through auctions, the scheme incentivizes power plants to operate more efficiently.

Benefitting Public Sector Banks: By ensuring a steady supply of coal and improving power plant operations, the scheme indirectly benefits public sector banks by reducing the risk of bad loans from the power sector.

Reduced Dependence on Imports: Increased domestic coal availability can potentially lead to a reduction in India's dependence on imported coal.

- Policy directions are supposed to be issued by the Ministry of Coal and Ministry of Power. The Coal India Limited/Singareni Collieries Company Limited and different power entities of the State and Central Government are responsible for the implementation of the policy.

Angel tax

Why in News? Amid a sharp decline in funding for startups and consequent job losses, **Indian Inc** has sought the **removal of Angel Tax** that has been a subject of heated debate between the industry and the government ever since the scope of the controversial tax was expanded in the Finance Bill 2023.

What is Angel Tax?

Angel tax refers to the income tax levied on the funds raised by unlisted companies in India, specifically when the investment amount exceeds the fair market value of the company's shares. It's essentially a tax on the premium paid by investors for the shares.

Why is it called Angel Tax?

- The term "angel" refers to angel investors, who are typically high-net-worth individuals who provide early-stage funding to startups and small businesses. Since Angel Tax applies to such investments exceeding fair market value, the name stuck.

How is Angel Tax Calculated?

The tax is levied at a hefty rate of **30.9%** on the investment amount that surpasses the fair market value of the company's shares.

For example:

- A startup issues shares at Rs. 1000 each.
- The fair market value of the company is determined to be Rs. 500 per share.
- An investor buys 10,000 shares at Rs. 1000 each (Rs. 10,000,000).
- The premium paid by the investor is Rs. 500 per share (Rs. 1000 - Rs. 500).
- Angel Tax will be applicable on Rs. 5,000,000 (10,000 shares * Rs. 500 premium).
- The tax amount payable would be Rs. 1,545,000 (30.9% of Rs. 5,000,000).

Criticisms of Angel Tax:

- **Discourages Investment:** The high tax rate discourages angel investors from providing crucial funding to startups, hindering their growth potential.
- **Difficulty in Determining Fair Market Value:** Accurately determining the fair market value of an unlisted company can be challenging, leading to disputes with tax authorities.

Relaxations and Exemptions:

Recognizing the challenges, the government introduced some relaxations and exemptions:

- **Startup Exemption:** Startups registered with the Department for Promotion of Industry and Internal Trade (DPIIT) can be exempt from Angel Tax if they meet specific criteria, such as a maximum paid-up capital and share premium limit.
- **Investor Criteria:** For startups to claim exemption, the investors should meet certain criteria related to minimum income or net worth.

Enemy Agents Ordinance:

Why in News? The J&K DGP R R Swain has said that those found helping terrorists in Jammu and Kashmir should be tried by probe agencies under the Enemy Agents Ordinance, which is much harsher than the UAPA and has the punishment of **either life term or death sentence**.

- The Enemy Agents Ordinance, 2005 (1948) was promulgated under **Section 5 of the Jammu and Kashmir Constitution Act, 1996**.

- It describes “enemy” as “**any person, directly or indirectly, participating** or assisting in the campaign undertaken by raiders from outside in subverting the Government established by law in the Union territory of J&K.
- “**Enemy agent**”, according to it, means a person not operating as a member of enemy armed force, who is employed by or works for or acts on instructions received from the enemy.
- Crimes under the Ordinance are punishable with death or rigorous imprisonment for life or with rigorous imprisonment for a term which may extend to **10 years and shall also be liable to fine.**

1. **Prohibited Activities:**

Espionage: Activities involving the gathering of secret or confidential information without authorization, which is intended to be delivered to a foreign power.

Sabotage: Deliberate actions aimed at damaging or disrupting vital infrastructure, military assets, or other critical facilities.

Subversive Activities: Efforts to undermine the authority or stability of the state, including incitement to violence, spreading of propaganda, and other actions that threaten national security.

2. **Powers Granted to Authorities:**

Arrest and Detention: The ordinance usually grants law enforcement and security agencies the power to arrest and detain suspected enemy agents without warrant for a specified period.

Search and Seizure: Authorities may have the power to search premises, seize documents, and confiscate equipment believed to be used for enemy activities.

Surveillance: Enhanced powers to conduct surveillance and intercept communications of suspected individuals or groups.

3. **Legal Procedures:**

Special Courts: Cases involving enemy agents may be tried in special courts or tribunals with procedures tailored for handling sensitive information.

Burden of Proof: The ordinance might adjust the standard burden of proof, considering the nature of intelligence and security work, which often relies on classified information.

4. **Penalties:**

- The ordinance typically prescribes severe penalties for those found guilty of being enemy agents, including **long-term imprisonment, fines, and in some cases, capital punishment.**

Objectives of the Enemy Agents Ordinance

1. **National Security:** To protect the country from espionage, sabotage, and subversion by hostile entities.
2. **Deterrence:** To deter individuals and groups from engaging in activities that threaten national security.
3. **Swift Justice:** To ensure quick and effective legal action against those involved in enemy activities, minimizing prolonged threats.

Historical and Contemporary Context

- **Historical Context:** Many countries have enacted such ordinances during times of war or heightened international tension. **For example, during World War II**, several countries introduced laws to counter espionage and sabotage by enemy agents.
- **Contemporary Context:** In the modern era, such ordinances are often part of broader counter-terrorism and national security frameworks. They are designed to address threats not only from state actors but also from non-state actors such as terrorist organizations.

Examples and Application

1. **India:** During and after World War II, India, under British rule, had regulations addressing enemy agents to counter threats from Axis powers and their supporters.
2. **United States:** The Espionage Act of 1917 and the subsequent National Security Act are examples of American laws aimed at countering espionage and subversive activities.
3. **United Kingdom:** The Official Secrets Act serves a similar purpose, protecting state secrets and countering espionage.

Criticisms and Concerns

1. **Human Rights:** Such ordinances often raise concerns regarding civil liberties and human rights, particularly regarding detention without trial, surveillance, and the broad powers granted to authorities.
2. **Abuse of Power:** There is a risk of misuse or abuse of these laws for political purposes or to suppress dissent.
3. **Transparency and Oversight:** Ensuring adequate oversight and transparency in the implementation of these laws is critical to prevent violations of due process.

Conclusion:

The Enemy Agents Ordinance is a critical tool for maintaining national security, especially in times of conflict or heightened threats from foreign adversaries. While it provides necessary powers to counter espionage and subversion, it must be implemented with safeguards to

protect civil liberties and prevent misuse. The balance between security and individual rights remains a pivotal consideration in the application of such ordinances.

Centre's anti-cheating bill passed in Lok Sabha

Why in News? The bill to curb cheating and other unfair means in various public examinations was recently passed in the Lok Sabha.

- The objective of the Bill is to bring greater transparency, fairness and credibility to the public examination systems, the legislation stated.

The Public Examinations (Prevention of Unfair Means) Bill, 2024, moved by the ministry of personnel, public grievances and pensions mentions the kinds of unfair means in examinations that are punishable by law once enacted, and the punishment for the offences.

“The objective of the Bill is to bring greater transparency, fairness and credibility to the public examination systems and to reassure the youth that their sincere and genuine efforts will be fairly rewarded and their future is safe,” the bill stated.

“The Bill is aimed at effectively and legally deterring persons, organised groups or institutions that indulge in various unfair means and adversely impact the public examination systems for monetary or wrongful gains,” the bill added.

- The draft law aims to contain cheating in various public examinations, including those conducted by the Union and state public service commissions, railways, and entrance examinations for medical, engineering and university programmes.

Offences under this bill

The bill identifies the following unfair means and offences during public examinations.

1. Question paper or answer key leaks
2. Participation in collusion with others to effect question paper or answer key leaks
3. Accessing or taking possession of question paper or an Optical Mark Recognition (OMR) response sheet without authority
4. Providing solution to one or more questions by any unauthorised person during a public examination
5. Directly or indirectly assisting the candidate in any manner unauthorisedly in the public examination
6. Tampering with answer sheets including OMR response sheets;
7. Altering the assessment except to correct a bona fide error without any authority
8. Willful violation of norms or standards set up by the central government for conduct of a public examination on its own or through its agency.
9. Tampering with any document necessary for short-listing of candidates or finalising the

- merit or rank of a candidate in a public examination.
10. Deliberate violation of security measures to facilitate unfair means in conduct of a public examination.
 11. Tampering with the computer network or a computer resource or a computer system
 12. Manipulation in seating arrangements, allocation of dates and shifts for the candidates to facilitate adopting unfair means in examinations
 13. Threatening the life, liberty or wrongfully restraining persons associated with the public examination authority or the service provider or any authorised agency of the Government; or obstructing the conduct of a public examination.

Streptococcal Toxic Shock Syndrome (STSS)

Streptococcal Toxic Shock Syndrome (STSS) is a severe illness caused by infection with certain strains of Group A Streptococcus (GAS) bacteria. These bacteria are the same ones that can cause mild infections like strep throat and impetigo, but in the case of STSS, the infection is much more serious and can be life-threatening.

Causes:

Bacterial Infection: STSS is caused by Group A Streptococcus bacteria, specifically strains that produce toxins. These bacteria can enter the body through wounds, surgical sites, or mucous membranes.

Toxin Production: The bacteria produce toxins (superantigens) that can trigger a massive immune response, leading to widespread inflammation and tissue damage.

Symptoms:

High Fever: A sudden and high fever is one of the first symptoms.

Hypotension: Low blood pressure (shock) that can result in dizziness, fainting, or confusion.

Rash: A red, flat rash that covers large areas of the body.

Organ Failure: Rapid progression to multi-organ failure, affecting the kidneys, liver, lungs, and other vital organs.

Severe Pain: Severe pain, especially in an infected wound or in muscles.

Flu-like Symptoms: Including chills, muscle aches, and nausea or vomiting.

Diagnosis:

Clinical Evaluation: Assessment of symptoms and physical examination.

Laboratory Tests: Blood tests to check for the presence of Group A Streptococcus bacteria, elevated white blood cell count, and signs of organ dysfunction.

Imaging Studies: In some cases, imaging studies may be required to identify the source of infection.

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Mainland serow

Why in News? Mainland Serow species was recently seen in Raimona National Park

About mainland serow :

- The mainland serow (*Capricornis sumatraensis*), also known as the common serow, is a species of goat-antelope found in various mountainous regions of **South and Southeast Asia**.
- The Mainland Serow population is widely distributed in the neighboring Phibsoo Wildlife Sanctuary and the **Royal Manas National Park of Bhutan**, which may contribute to the population recovery in **Raimona National Park**.

About Raimona National Park :

- Raimona National Park is a protected area located in the **Indian state of Assam**. It is one of the newest additions to India's network of national parks, having been officially declared as such in June 2021.

Location:

- **Geographical Area:** Raimona National Park is situated in the Kokrajhar district of Assam. It is part of the **Eastern Himalayan biodiversity region**.
- **Proximity:** The park is contiguous with the **Phipsoo Wildlife Sanctuary in Bhutan**, forming part of a larger transboundary conservation landscape.

Flora and Fauna:

Biodiversity: Raimona National Park is rich in biodiversity and is home to a variety of species of both **flora and fauna**.

Flora: The park includes diverse forest types such as sal forests, tropical semi-evergreen forests, and riverine forests. It also features **grasslands and wetland ecosystems**.

Fauna: The park is a habitat for several important species including the golden langur, which is an endangered primate species.

Other notable species include the Asian elephant, Royal Bengal tiger, **Indian gaur (bison)**, clouded leopard, and several species of deer and birds.

Project Nexus:

Why in News ? The Reserve Bank of India (RBI), along with the Bank for International Settlements (BIS) and central banks of four ASEAN countries, is collaborating on Project Nexus, a multilateral initiative aimed at enabling efficient, faster, and cost-effective retail cross-border payments.

About it :

- Nexus is a BIS Innovation Hub project that seeks to enhance cross-border payments by connecting multiple domestic instant payment systems (IPS) globally.
- The platform is expected to go live by 2026 and will interlink domestic fast payment systems (FPS) of Malaysia, the Philippines, Singapore, Thailand, and India.

About the Bank for International Settlements (BIS):

- It was established in 1930.
- It is an international organization that works specifically with central banks. Sometimes referred to as the "central bank for central banks".
- The BIS is headquartered in Basel, Switzerland.
- It aims to promote cooperation between central banks and financial stability globally.

AGENDA OF 16th FINANCE COMMISSION:

Why in News? The 16th finance commission has started looking at the roles & functioning of FC during its tenure.

Agenda for the 16th Finance Commission:

- **Cities as Engines of Growth:** Cities contribute around 66% of India's GDP and about 90% of total government revenues.
- Urban areas are crucial spatial zones for national development, requiring substantial infrastructure investments.
- **Challenges in Financial Devolution:** Despite efforts of multiple finance commissions, financial devolution to cities remains inadequate.
- Intergovernmental transfers to Urban Local Bodies (ULBs) in India are significantly lower compared to other developing nations.

Impact of Taxation System: Introduction of GST has reduced ULBs' tax revenue, posing challenges to their financial health.

Low State Transfers: State transfers to ULBs recommended by State Finance Commissions have been minimal, hindering financial empowerment post-74th amendment.

Growth of Parallel Agencies: Parallel agencies and schemes have weakened local governments both financially and operationally. Programs like MPLADS and MLALADS distort the intended roles of local governments in the federal structure.

Importance of Census Data:

- Accurate population figures are crucial for effective resource allocation and planning for urban areas.
- Revisiting Financial Commission Principles: The 15th Finance Commission's principles require adjustment to reflect current urbanization dynamics and infrastructure needs.
- Doubling IGTs to urban areas is essential to meet future urban infrastructure demands.

Local Bodies and Constitutional Amendments:

- Since the 73rd and 74th constitutional amendments, local bodies have gained significant recognition within the federal system.
- **Financial Mandate:** Amendments introduced clauses mandating the Finance Commission to recommend measures supporting panchayats and municipalities from State funds (sub-clauses 280(3)(bb) and (c)).

NITI Aayog's SDG India Index: 2024

Why in News? Uttarakhand and Kerala have taken the top spot among states in NITI Aayog's SDG India Index 2023-24, which assesses sustainable development across states on the basis of the **United Nations' Sustainable Development Goals (SDG)**.

- Overall, India's SDG score improved to 71 points in 2023-24 from 66 points in 2020-21, supported by progress made in poverty reduction, economic growth, and climate action.
- The SDG India Index, which evaluates progress made across 16 goals on a scale of 1 to 100, rated Kerala and Uttarakhand as the best performing states with a score of 79 points each, while Bihar emerged as a laggard with 57 points, followed by **Jharkhand at 62 points**.
- Compared to 2020-21 scores, which was the last time NITI Aayog published the index, **Punjab, Manipur, West Bengal, and Assam** recorded the highest increase of 8 points to 76, 72, 70, and 65 points respectively.

- The SDGs are a set of interconnected global goals established by the United Nations to be achieved by 2030. The latest SDG India Index is in its fourth edition and relies on 113 indicators to assess a state's performance.

Among goals, “No Poverty”, “Decent Work and Economic Growth”, and “Life on Land” recorded the highest increase in points across states from 2020-21 scores, while goals like **“Gender Equality”** and **“Peace, Justice, and Strong Institution”** saw the smallest increase in points. Notably, “Reduced Inequalities” was the only goal to record a reduction in points to 65 in 2022-23 from 67 in 2020-21.

“Reduced Inequalities is the only SDG in which there is a marginal drop and this is also an area that shows you the distribution of wealth. So, you can see that in large parts of India, there are states where inequalities are high and I think it is linked to getting employment at the bottom of the pyramid,” Subrahmanyam said.

- “Inequality in India has not increased, it has reduced. There has been a contraction in the consumption gap between the richest 10 per cent and the bottom 10 per cent.
- You look at the number of taxpayers who have filed income tax returns, it has gone up dramatically in the last number of years. People in the lower tax slabs are going to the upper tax slab,” Subrahmanyam said.
- He added that the Reduced Inequalities goal also includes gender inequality in terms of labour workforce participation. **The Gender Equality goal** received the lowest score of 49 points among all goals, recording a marginal increase of 1 point from 2020-21. “You will see the states which are not doing well have issues like the sex ratio at birth. There are states which are below 900 even now.
- So, that gets reflected here. **You have other issues like women owning land**, women owning assets, women in employment, women's labour force participation rate– that would be weaker. If there is one area of maximum concern, it is this,” Subrahmanyam said.
- In the latest report, the all-India score for the Zero Poverty goal recorded an increase of 8 points to 72. **“Most of India has actually hit the issue of extreme** You don't have people suffering from hunger and disease. Livelihoods are not an issue. Maybe their aspirations are there for higher and higher livelihoods, but basic survival is no longer an issue in most parts of India,” Subrahmanyam said.
- With respect to the **Zero Hunger goal**, **the score for which increased by 5 points** to 52, Subrahmanyam said that focus needs to be on providing nutritious food to tackle malnourishment, stunting, and low body mass index (BMI) scores.

Top of Form:

- Bottom of Form
- On the “**Quality of Education**” goal, which increased by 4 points to 61, Subrahmanyam said, “In India, we have solved the problem of lack of access. Most states are actually below **30 students per teacher**. So, there’s no shortage of teachers for education. Some states have improved but some of the reds, like in central India, are very sticky. Access in India is not an issue, it’s quality and that gets reflected in other areas where they get good employment opportunities.”

Why is Project 2025 controversial?

It advocates expanding the president’s powers, and concentrating decision-making authority in the White House. Conversely, it argues for drastically reducing the power, and cutting the funding, of various federal administrative departments. Among its notable recommendations is to “disband” the Department of Education.

- Project 2025 calls for the reclassification of tens of thousands of federal workers — possibly the most dramatic change in the federal workforce since the 1880s. This will allow the president to appoint loyalists who side with him, and his administration.
- The policy document calls for a “**biblically based**” definition of marriage and family, which it clarifies means “heterosexual, intact marriage”. It also pushes a number of anti-LGBTQ+ positions, such as rescinding federal anti-discrimination protections “on the basis of sexual orientation, gender identity, transgender status, and sex characteristics”.
- On reproductive rights, Project 2025 advocates the prosecution of people who send abortion pills through the mail, the cancellation of the **Food and Drug Authority’s** two-decade-old approval of mifepristone, one of the two drugs used in medication abortion, and the federal tracking of abortion-seekers using “every available tool”.
- The policy document recommends “unwinding... the Biden Administration’s climate fanaticism”. For example, it recommends ending wind and solar power subsidies, scrapping energy-efficiency standards for appliances, prioritising the use of fossils, and dismantling the National Oceanographic and Atmospheric Administration (NOAA) and the Clean Energy Corps.
- Project 2025 calls to expand on Trump’s crackdown on illegal immigration during his previous term. For instance, it advocates for higher thresholds for accepting immigrants and refugees, and increasing the amount of time undocumented children can spend in the detention centres.

Who is behind Project 2025?

- Project 2025 is spearheaded by the Heritage Foundation, a Washington DC-based conservative think tank. Heritage platforms researchers and analysts from a wide range of fields, who — according to the organisation’s website — seeks solutions to “protect America’s future”.
- “From empowering parents in education, reversing growing spending and inflation, and protecting the unborn, to securing America’s borders, countering the threat of Communist China, holding Big Tech accountable, and ensuring free and fair elections — Heritage is on the front lines in the fight to help Americans thrive,” the foundation’s website says.
- Heritage has been publishing the ***Mandate for Leadership*** series since 1981. Each publication coincides with a presidential election, and offers specific conservative policy recommendations for the federal government. From Ronald Reagan to Donald Trump, the *Mandate* series has been highly influential in guiding Republican presidents’ actions. According to Heritage’s website, Trump “embraced nearly two-thirds of Heritage’s proposals within just one year in office” including leaving the Paris Climate Accords, increasing military spending, and increasing off-shore drilling.
- **Project 2025 builds off Heritage’s Mandate** series, collaborating with more than 100 other conservative organisations.
- These include the Center for Renewing America, a Christian nationalist policy think tank headed by **Russel Vought**; **Moms for Liberty**, which has vociferously advocated against school curricula that mention LGBTQ+ rights, race and ethnicity, critical race theory, and discrimination; and the National Rifle Association, gun rights lobbying and advocacy group.

Is Project 2025 attached to the Republican party?

- Officially, no. None of the organisations involved are directly affiliated to the Republican Party. As Heritage’s website claims, “we don’t work on behalf of any special interest or political party. Instead, our commitment is to the American people.”
- That being said, **the link between Project 2025**, the Republican Party, and Donald Trump is undeniable. Apart from individually endorsing Trump and the Republican Party, these organisations are also among their biggest funders.

So, why is Trump now trying to distance himself from Project 2025?

- In 2022, Trump praised Heritage’s plans in a dinner sponsored by the foundation. “This is a great group, and they’re going to lay the groundwork...for exactly what our

movement will do... [when] the American people give us a colossal mandate to save America,” he said.

- More recently, however, Trump has refused to even acknowledge Project 2025's existence. In a post on social media platform Truth Social on Friday, Trump wrote: “I know nothing about Project 2025... I have no idea who is behind it”.
- Trump's attempt to distance himself from Project 2025 comes as Democrats have mounted a scathing attack on the former president based on the controversial policy platform.
- While many of Project 2025's priorities are aligned with Trump's own explicated political positions, Project 2025 also goes beyond what Trump has said — or is likely to say during the campaign.

MANAS' (Madak Padarth Nishedh Asuchna Kendra)

Why in News ? National Narcotics Helpline 'MANAS' (Madak Padarth Nishedh Asuchna Kendra) has been recently launched by the Ministry of Home Affairs.

Key Points:

- The Minister launched a toll-free helpline called MANAS (Madak Padarth Nishedh Asuchna Kendra) at **1933**.
- All agencies should move from '**Need to Know**' policy to that of '**Duty to Share**'.
- There should be a ruthless approach towards supply of drugs, a strategic approach towards demand reduction and a humane approach towards harm reduction.

About the Narcotics Control Bureau (NCB):

- It is India's leading federal law enforcement agency responsible for combating drug trafficking and illegal drug use.
- **Established in 1986**, the NCB functions under the Ministry of Home Affairs and functions as both an intelligence and enforcement agency.

The NCB's roles and responsibilities:

Enforcement: The NCB enforces the **Narcotic Drugs and Psychotropic Substances Act, 1985** (NDPS Act) to investigate and prosecute individuals and organizations involved in the production, possession, **sale, distribution, and transportation of illegal drugs**.

Intelligence gathering: The NCB gathers **intelligence on drug trafficking trends**, routes, and syndicates to disrupt their operations and prevent the inflow of illegal drugs into India.

Coordination: The NCB coordinates with various state and central government agencies, as well as international drug enforcement agencies, to fight drug trafficking effectively.

Awareness campaigns: The NCB conducts awareness campaigns to educate the public about the dangers of drug abuse and addiction.

About the Narco-Coordination Centre (NCORD) :

- It is an initiative by the Government of India to combat drug trafficking and abuse in the country.
- Established under the Ministry of Home Affairs (MHA), NCORD serves as a high-level central coordination body that aims to streamline and strengthen efforts against narcotics.
- **Establishment:** NCORD was set up to enhance the coordination among various central and state agencies involved in drug law enforcement and to ensure a unified and effective approach to combating drug trafficking and abuse.

Objectives:

- Facilitating better coordination and cooperation among different drug enforcement agencies.
- Implementing a comprehensive and integrated approach to tackle drug trafficking.
- Strengthening the intelligence-sharing mechanisms among various agencies.
- Formulating policies and strategies to curb drug abuse and trafficking.
- Ensuring effective implementation of drug laws and regulations.

Structure and Functioning:

Central Level: At the central level, it involves various ministries and agencies such as the Ministry of Home Affairs, Narcotics Control Bureau (NCB), Directorate of Revenue Intelligence (DRI), Central Bureau of Narcotics (CBN), and other relevant departments.

State Level: Each state has its own coordination mechanism involving state police, excise departments, and other local enforcement agencies. NCORD ensures that these state-level efforts are aligned with the national strategy.

Zonal Level: Regional or zonal coordination mechanisms are also established to address inter-state drug trafficking issues.

Key Functions:

- Organizing regular meetings and discussions among stakeholders to review the current drug scenario and strategize accordingly.
- Promoting capacity building and training for law enforcement agencies to improve their effectiveness in dealing with narcotics-related issues.
- Enhancing public awareness about the dangers of drug abuse through various campaigns and initiatives.
- Facilitating the exchange of information and intelligence among agencies to preempt and combat drug trafficking networks.

Policy Formulation and Implementation: NCORD plays a crucial role in the formulation of national policies

related to drug control and ensures their effective implementation. It also monitors and evaluates the performance of various drug control measures.

Inter-Agency Collaboration:

- One of the key strengths of NCORD is its ability to foster collaboration among various national and international agencies.
- This includes coordination with agencies like **INTERPOL**, **United Nations Office** on Drugs and Crime (UNODC), and other international bodies involved in combating narcotics.

Newcastle Disease (ND):

Why in news ? Recently , a new Newcastle Disease detected in Brazil poultry farm.

About Newcastle Disease (ND):

- Newcastle Disease (ND) is a highly contagious and serious viral disease that primarily affects birds, especially domestic poultry like chickens, turkeys, and ducks. It's caused by virulent strains of avian paramyxovirus type 1.

Severity: ND can be very severe, causing significant economic losses in the poultry industry due to high mortality rates in unvaccinated birds.

Spread: The virus spreads quickly through contact with infected birds, their droppings, and contaminated equipment or clothing.

Strains: There are different strains of the virus with varying degrees of severity:

Lentogenic: Mildest form, causing few or no symptoms.

Mesogenic: Moderate form, with some illness and mortality.

Velogenic: Most virulent form, causing severe illness and high mortality (also called Exotic Newcastle Disease).

Symptoms: Clinical signs depend on the strain and can include:

- Respiratory distress (gasping, coughing)
- Nervous signs (twisting of the head, paralysis)
- Depression, lethargy
- Diarrhea
- Drop in egg production and abnormal eggshells

Mashco Piro Tribe :

Why in news? The tribe was recently first time photographed in a open place in the remote Peruvian Amazon.

About MASHCO Piro Tribe :

The Mashco Piro tribe is an indigenous group in the Amazon rainforest, primarily in Peru. They are known for their reclusive and often hostile stance toward outsiders.

Location: The Mashco Piro live in the remote areas of the Amazon rainforest, particularly in the Madre de Dios region of southeastern Peru. They are also **found in parts of Brazil**.

Lifestyle: The Mashco Piro are traditionally hunter-gatherers, relying on the rich biodiversity of the rainforest for their sustenance. They hunt game, fish, and gather fruits, nuts, and other forest resources.

Isolation: The Mashco Piro are one of the many uncontacted or voluntarily isolated tribes in the Amazon. They have had minimal contact with the outside world and prefer to remain isolated, which has helped them preserve their traditional way of life.

Hostility to Outsiders: Historically, the **Mashco Piro** have been known to be hostile toward outsiders. This hostility is often attributed to traumatic encounters with loggers, drug traffickers, and other groups that have encroached upon their territory. Such encounters have led to violence and mistrust.

- **Legal Protection:** The Peruvian government, recognizing the need to protect uncontacted tribes like the **Mashco Piro**, has established protected areas and implemented policies to minimize contact and prevent intrusion into their territories. This is to safeguard both the tribes and those who might inadvertently come into contact with them.

Recent Encounters: In recent years, there have been more sightings and encounters with the Mashco Piro, often near the **Manu National Park**. These encounters sometimes result from the tribe moving closer to areas of human activity, possibly due to resource depletion or other pressures within their traditional territories.

Conservation and Human Rights: The Mashco Piro's situation highlights the intersection of conservation efforts and indigenous rights. Organizations and governments work to balance the protection of the Amazon rainforest with the rights and autonomy of its indigenous inhabitants.

Challenges: The Mashco Piro face numerous challenges, including threats from illegal logging, mining, and other extractive activities that encroach on their land. Climate change and diseases brought by outsiders also pose significant risks to their survival.

Variable Rate Repo (VRR)

Variable Rate Repo (VRR) is a monetary policy tool used by central banks to inject liquidity into the banking system. Unlike the traditional repo operation where the interest rate is fixed, the VRR allows banks to borrow funds from the central bank at a rate determined by the market.

Key features of VRR:

Market-determined interest rate: The interest rate on a VRR is not fixed by the central bank but is determined through an auction process based on market demand and supply.

Liquidity injection: By offering VRR, the central bank aims to provide additional funds to banks, which can help improve lending conditions and stimulate economic activity.

Flexibility: VRR offers flexibility to both the central bank and commercial banks in terms of the amount and duration of the operation.

Why is it used?

Central banks employ VRR to:

- **Manage liquidity:** To address temporary liquidity shortages in the banking system.
- **Support credit growth:** By providing additional funds to banks, VRR can encourage lending and boost economic growth.
- **Signal monetary policy stance:** The use of VRR can signal the central bank's intention to ease monetary policy.

Variable Rate Reverse Repo (VRRR)

Variable Rate Reverse Repo (VRRR) is a monetary policy tool used by central banks to absorb excess liquidity from the banking system. It's essentially the opposite of a repo operation.

How does it work?

In a VRRR, the central bank offers to borrow money from commercial banks for a specified period, at an interest rate that fluctuates based on a predetermined benchmark. Banks that have surplus funds can lend these funds to the central bank, earning interest on their excess reserves.

Key features of VRRR:

- **Market-based interest rate:** The interest rate on VRRR is typically linked to a market benchmark like the repo rate or the overnight money market rate.
- **Absorption of liquidity:** By borrowing from banks, the central bank effectively drains excess liquidity from the system, helping to control inflation and stabilize interest rates.

- **Flexibility:** VRRR offers flexibility to both the central bank and commercial banks in terms of the amount and duration of the operation.

Why is it used?

Central banks employ VRRR to:

- **Manage liquidity:** To prevent excessive liquidity from fueling inflation.
- **Control interest rates:** By influencing short-term interest rates through VRRR, the central bank can indirectly impact lending rates in the economy.
- **Signal monetary policy stance:** The use of VRRR can signal the central bank's intention to tighten monetary policy.

Standing Deposit Facility (SDF)

Standing Deposit Facility (SDF) is a monetary policy tool introduced by the Reserve Bank of India (RBI) to absorb excess liquidity from the banking system. It allows banks to deposit surplus funds with the RBI without the need for any collateral.

How does it work?

- **Excess Liquidity Absorption:** When banks have more funds than required, they can deposit this excess with the RBI through the SDF.
- **Interest Rate:** The RBI pays interest on these deposits, which is typically lower than the repo rate. This makes it less attractive for banks to park their funds with the RBI compared to lending it out.
- **Collateral-Free:** Unlike the reverse repo, SDF does not require any collateral from the banks.

Purpose of SDF:

- **Liquidity Management:** The primary goal of SDF is to control the amount of money circulating in the economy. By absorbing excess liquidity, the RBI can help prevent inflation.
- **Interest Rate Corridor:** SDF, along with the repo rate and reverse repo rate, forms the interest rate corridor, influencing overall interest rates in the economy.

Consumer Food Price Index (CFPI)

The Consumer Food Price Index (CFPI) is a measure of the change in retail prices of food items consumed by the population. It's essentially a specific measure of inflation that focuses solely on the price changes of food products in a consumer's shopping basket.

Key points about CFPI:

- **Focus on food:** Unlike the broader Consumer Price Index (CPI) which measures the price changes of a wide range of goods and services, CFPI specifically tracks the prices of food items.

- **Retail prices:** The CFPI is based on retail prices, which are the final prices paid by consumers.
- **Impact on consumers:** The CFPI is a crucial indicator of the cost of living for consumers, as food is a significant component of household budgets.
- **Policymaking:** Governments and central banks use the CFPI to monitor inflation trends and make policy decisions related to food prices and overall economic stability.

Capital to Risk (Weighted) Assets Ratio (CRAR)

CRAR, also known as the **Capital Adequacy Ratio (CAR)**, is a measure of a bank's financial health. It determines a bank's ability to absorb losses and continue operations without failing.

How is it calculated?

CRAR is calculated by dividing a bank's capital by its risk-weighted assets.

CRAR = (Tier 1 Capital + Tier 2 Capital) / Risk-Weighted Assets

- **Tier 1 Capital:** This is the core capital of a bank, including equity, retained earnings, and reserves.
- **Tier 2 Capital:** This is supplementary capital, including undisclosed reserves, general loss reserves, and subordinated debt.
- **Risk-Weighted Assets:** These are the bank's assets assigned different risk weights based on their associated risk. For instance, government bonds are considered less risky than loans to individuals.

Why is it important?

- **Protects depositors:** A higher CRAR indicates a stronger financial position, reducing the risk of a bank failing and losing depositors' money.
- **Maintains stability:** A well-capitalized banking system contributes to overall financial stability.
- **Regulatory requirement:** Banks are required to maintain a minimum CRAR as mandated by regulatory authorities.

Basel Accords:

The Basel Accords, developed by the Basel Committee on Banking Supervision, set international standards for CRAR. These standards aim to strengthen the banking system and protect the global economy.

Zero Coupon, Zero Principal (ZCZP)

A Zero Coupon, Zero Principal (ZCZP) is essentially a donation made in the form of a security. Unlike traditional bonds, which offer interest payments (coupons) and return the principal amount at maturity, ZCZPs offer neither.

Key Characteristics of ZCZPs:

- **No Interest (Zero Coupon):** Investors do not receive any periodic interest payments.
- **No Principal Return (Zero Principal):** The invested amount is not returned at maturity.
- **Social Impact:** ZCZPs are primarily used by Non-Profit Organizations (NPOs) to raise funds for social causes.
- **Tax Benefits:** In many jurisdictions, ZCZP purchases qualify for tax deductions, making them attractive to donors.

Why invest in ZCZPs?

- **Social Impact:** Investors can contribute to a social cause while availing tax benefits.
- **Transparency:** ZCZPs are listed on a stock exchange, ensuring transparency in fund utilization.
- **Investment Recognition:** Investors can receive recognition for their contribution.

Indexed Purchase Price:

Why in news? Finance Minister Nirmala Sitharaman introduced significant revisions to capital gains taxation, focusing particularly on real estate transactions in the Union Budget 2024.

The budget eliminated the indexation benefit, which previously enabled property owners to adjust their purchase price for inflation, thereby reducing taxable profits.

About Indexed Purchase Price:

- Indexed purchase price is the original purchase price of an asset adjusted for inflation using the Cost Inflation Index (CII). This adjusted price is used to calculate long-term capital gains tax.

How it works ?

Cost Inflation Index (CII): This is a numerical figure released annually by the Indian government to account for inflation.

Indexation: The original purchase price of an asset is multiplied by a ratio of the CII of the year of sale to the CII of the year of purchase. This gives the indexed purchase price.

Capital Gains Calculation: The indexed purchase price is subtracted from the sale price to determine the capital gains. This adjusted figure is then taxed at the applicable long-term capital gains tax rate.

Why it's important:

Reduces tax liability: By accounting for inflation, indexation helps reduce the taxable capital gains.

Fairness: It ensures that the taxpayer is not unduly burdened by the effects of inflation.

For example, if you purchased a property for ₹25 lakhs in 2000 and sold for ₹1 crore in 2024, the indexed purchase price would have been adjusted for inflation, substantially reducing the taxable gain.

Report on Currency and Finance (RCF) for 2023-24 : RBI

Why in News? The RBI has recently released the Report on Currency and Finance (RCF) for 2023-24:

Key points of the report :

- digitalisation-induced changes in the behaviour of consumers and financial intermediaries can have implications for monetary policy.
- Digitalisation can also create a more complex and interconnected financial system with implications for financial stability.
- “While improving accessibility and convenience of financial services for customers, digitalisation raises concerns related to impulsive spending, herd behaviour and data security.
- Digital platforms enable quick dissemination of financial trends and choices, allowing information about investments, spending habits, and financial products to spread rapidly across social networks.
- When customers observe large groups engaging in certain financial activities, such as mass buying or selling of stocks during a market frenzy, they are more likely to follow the crowd. Similarly, driven by herd behaviour, depositors may withdraw their money from banks, leading to potential bank runs or failures.

What report said about Project Nexus?

- The RBI has joined Project Nexus, a multilateral international initiative to enable instant cross-border retail payments by interlinking domestic **Fast Payments System (FPS)**.
- As part of the project, the country's Unified Payments Interface (UPI) and FPSs of Malaysia, Philippines, Singapore and Thailand will be interlinked through Nexus.

- In terms of data breaches, the survey said that the average cost of data breaches in India stood at \$2.18 million in **2023**, a **28 per cent increase since 2020** albeit less than the global average cost of data breach.
- The most common attacks in India are phishing (22 per cent), followed by stolen or compromised credentials (**16 per cent**).
- The report said that digitalisation can impact inflation and output dynamics, and monetary policy transmission in diverse manners and the overall impact could vary over time given the fast pace of developments.
- The monetary policy impact could be dampened if digitalisation leads to shifting of credit supply from banks to less-regulated / unregulated nonbanks, or by offsetting reductions in bank deposits.

In this environment, central banks would need to incorporate digitalisation aspects comprehensively into their models for the continued efficacy of monetary policy and the achievement of their price and financial stability goals.

The RBI has been undertaking proactive policy measures to harness the benefits of digitalisation while mitigating the emerging risks of digitisation in the financial sector.

- The report, however, said that digitalisation can provide a strong boost to India's external trade in goods and services, given the country's relative comparative advantage in modern services exports, which are not conditional upon the geographical proximity of the trading partners.
- Digitalisation in international payment systems has the potential to reduce the cost of receiving remittances, thereby leading to higher remittances and income or savings for the recipients.
- Earlier this month, the RBI joined Project Nexus, a multilateral international initiative to enable instant cross-border retail payments by interlinking domestic Fast Payments System (FPS).
- As part of the project, the country's **Unified Payments Interface (UPI) and FPSs of Malaysia, the Philippines, Singapore and Thailand** will be interlinked through Nexus.

What is Impulsive Spending?

- Impulsive spending refers to the act of making unplanned, spontaneous purchases without prior intention or consideration of the consequences. It often involves buying items on a whim, driven by emotions, advertising, or immediate gratification rather than rational decision-making.

What is Herd behavior?

- Herd behavior in economics refers to individuals' tendency to mimic the actions of a larger

group, often disregarding their own beliefs or information. This phenomenon is driven by the assumption that the majority is more likely to be correct, or by the desire to conform to social norms.

Denmark imposes the World's First Carbon Tax on Livestock Emissions:

Why in news? Denmark's coalition government approved a plan to put in place the **world's first carbon emissions** tax that targets farms.

This is a big step for the country in its efforts to leave less of an impact on the environment, which is mostly driven by its strong pork and dairy production sectors.

- This means that a typical Danish dairy cow that puts out about **5.6 tonnes of CO2 per year** will have to pay a fee of **672 krone (\$96) per year** at first, rising to 1,680 krone (\$241) by 2035.
- The **Danish dairy business supports** climate goals, but they have mixed feelings about the way taxes are being used.
- Some important people are worried about how the measures might affect competition and how well they work.
- Critics say the policy is too complicated and comes with a **big risk that can't be promised to work**.

Yen carry trade:

Why in news ? Global equity markets experienced a severe downturn starting on Aug 05, causing significant declines in major markets from Tokyo to London. Japan's Nikkei had its largest single-day drop since 1987, indicating a major systemic issue.

What Happened on August 05, 2024?

- On August 05, 2024, markets took a sharp dive. The **Nikkei index dropped by 12.40%** and the Topix index by 12.48%, leading to trading halts. European and Indian markets also fell, with **India's Sensex losing over 2,200 points**, wiping out around ₹15 trillion in wealth.

What Caused the Meltdown?

- The main reason for this market collapse was the unwinding of the yen carry trade. This trading strategy involves borrowing money in Japan, where interest rates are low, and investing it in other countries with higher returns.
- As Japan started raising interest rates, this trade became less profitable.

Why is the Yen Carry Trade Unraveling Now?

- The **Bank of Japan increased interest rates to 0.25%** and announced plans to reduce its bond-buying program, strengthening the yen against the **US dollar**. This change made the yen carry trade less attractive, causing investors to sell off their positions quickly.

Are there other contributing factors?

- Other factors adding to the market instability included fears of a potential US recession, marked by rising unemployment to 4.3%, and geopolitical tensions, particularly concerns about a possible conflict involving Iran.

About yen carry trade:

- The yen carry trade involves borrowing the Japanese yen at low interest rates to invest in assets that offer higher returns. It became popular after the **1990s due to Japan's slow economic growth**.
- Traders make money by taking advantage of currency fluctuations.
- However, this strategy is risky, especially during times of **market volatility, as changes in currency value can lead to significant losses**.
- The **Bank of Japan's monetary policies** greatly affect the success of the yen carry trade. It works best when global investors are willing to take risks, often leading to large capital flows into emerging markets.

Disaster Management Amendment Bill 2024:

Why in News? The Union government has introduced the Disaster Management (Amendment) Bill 2024 in the Lok Sabha, proposing key changes to the existing Disaster Management Act of 2005, including a new authority for cities.

Key Provisions of the Bill :

- It seeks to make provision for a "State Disaster Response Force" by the State Government, was introduced by Minister of State for Home Nityanand Rai.

- It seeks to amend the Disaster Management Act, 2005, which was enacted to provide for the effective management of disasters.
- The objects and reasons of the bill states that the implementation of the Act has been reviewed in consultation with all stakeholders including state governments with the central Government laying thrust for mainstreaming the Disaster Management in the development plans.
- The Disaster Management (Amendment) Bill, 2024 seeks to bring more clarity and convergence in the roles of Authorities and Committees working in the field of disaster management, provide statutory status to certain pre-Act organisations like the National Crisis Management Committee and the High-Level Committee and to empower the National Disaster Management Authority and the State Disaster Management Authorities to prepare the disaster plan at national level and state level instead of the National Executive Committee and the State Executive Committee.
- The bill also seeks to provide for the creation of a disaster database at the national and state level.

Key Provisions of the Disaster Management Act, 2005

Institutional Framework:

- National Disaster Management Authority (NDMA): The Act establishes the NDMA, chaired by the Prime Minister, as the apex body responsible for laying down policies, plans, and guidelines for disaster management.
- State Disaster Management Authority (SDMA): Each state is required to establish an SDMA, chaired by the Chief Minister, to manage disasters at the state level.
- District Disaster Management Authority (DDMA): Each district is to have a DDMA, chaired by the District Collector or District Magistrate, to manage disasters at the district level.

Plans and Policies:

National Plan: The Act mandates the preparation of a National Plan for disaster management, covering all aspects of disaster risk reduction and response.

State and District Plans: States and districts are required to prepare disaster management plans consistent with the National Plan.

Powers and Functions:

NDMA: The NDMA is empowered to formulate policies, approve plans, and coordinate enforcement and implementation of disaster management policies and plans.

SDMA and DDMA: The SDMA and DDMA have similar roles at the state and district levels, respectively, ensuring effective disaster management within their jurisdictions.

National Executive Committee (NEC):

The NEC, comprising Secretaries to the Government of India, assists the NDMA in the discharge of its functions and ensures compliance with directives issued by the NDMA.

Knight of the Legion of Honour:

- Philanthropist and art collector **Kiran Nadar** was recently conferred “**Chevalier de la Légion d’Honneur**” (Knight of the Legion of Honour) by French Ambassador “**Chevalier de la Légion d’Honneur**” (Knight of the Legion of Honour) by French Ambassador to India Emmanuel Lenain.
- She was awarded for her contributions in the field of art, her commitment to providing greater access to culture both nationally and internationally.

Clean Plant Programme (CPP):

Why in news ? The Union Cabinet has recently approved the Clean Plant Programme (CPP) proposed by the Ministry of Agriculture and Farmers Welfare.

About :

- The Clean Plant Programme (CPP) aims to enhance the quality and productivity of fruit crops across the nation.
- It will be initiated by the Ministry of Agriculture and Farmers Welfare.

Implementation:

- The programme will be implemented by the National Horticulture Board in collaboration with the Indian Council of Agricultural Research (ICAR).

Key Benefits of the Clean Plant Programme (CPP):

1. **For Farmers:** Farmers will get access to virus-free, high-quality planting material. This will lead to better crop yields and higher income opportunities.
2. **For Nurseries:** Nurseries will benefit from easier certification processes and better infrastructure support. This will help them grow and distribute clean planting materials efficiently.
3. **For Consumers:** Consumers will enjoy better-tasting, virus-free fruits with improved nutritional value.
4. **For Exports:** The production of high-quality, disease-free fruits will strengthen India’s position as a top global fruit exporter, opening up more international market opportunities.

5. Inclusive Approach: The programme will ensure that all farmers, regardless of their land size or economic status, can access clean plant material. Special focus will be given to involving women farmers in planning and implementing the programme, giving them access to resources and training.

6. Region-Specific Development: The programme will develop clean plant varieties and technologies suited to different agro-climatic conditions across India.

ESG bonds :

Why in News? They are debt securities issued by governments, municipalities, corporations, or other organizations to fund projects with positive environmental, social, and governance (ESG) impacts.

Key Features of ESG Bonds:

Environmental Criteria: Focus on projects promoting environmental sustainability, such as renewable energy, energy efficiency, pollution control, or sustainable agriculture.

Social Criteria: Address social issues like affordable housing, education, healthcare, or community development to enhance social well-being and reduce inequalities.

Governance Criteria: Promote good corporate governance practices, transparency, and accountability.

Types of ESG Bonds:

Green Bonds: Specifically finance environmental projects.

Social Bonds: Focus on social issues.

Sustainability Bonds: Finance a combination of green and social projects.

Sustainability-Linked Bonds: Link the bond's financial terms to the issuer's achievement of pre-defined ESG targets.

Benefits of ESG Bonds:

Positive Impact: Contribute to addressing global challenges like climate change and social inequality.

Risk Management: Mitigate ESG-related risks by investing in companies with strong sustainability practices.

Investment Opportunities: Access a growing market with potential for attractive returns.

Alignment with Values: Invest in line with personal or institutional values.

Challenges and Considerations:

Greenwashing: The risk of companies falsely claiming to be environmentally friendly.

Standardization: Lack of consistent ESG reporting standards can make it difficult to compare investments.

Premium Pricing: ESG bonds may command a premium due to higher demand.

The Axiom Mission 4 (Ax-4) :

The Axiom Mission 4 (Ax-4) is the fourth private astronaut mission to the International Space Station (ISS) organized by Axiom Space, a private space company focused on expanding human space exploration and developing commercial space infrastructure.

The Ax-4 mission is part of Axiom Space's broader plan to create the first commercial space station, which will eventually serve as a replacement for the ISS.

Key Details of the Axiom-4 Mission:

Mission Objective: The Ax-4 mission aims to conduct scientific research, technology demonstrations, and commercial activities aboard the ISS. These activities are designed to advance our understanding of space environments, develop new technologies, and contribute to commercial space ventures.

Crew Composition: The mission typically includes a crew of private astronauts selected by Axiom Space. These crew members come from diverse backgrounds, including business, science, and technology. They undergo extensive training to prepare for their tasks on the ISS, including operating in microgravity and conducting experiments.

Launch Vehicle: The crew is launched aboard a SpaceX Crew Dragon spacecraft, which has been a reliable vehicle for transporting astronauts to the ISS. The Crew Dragon is launched on a **SpaceX Falcon 9 rocket**, known for its reusability and cost-effectiveness.

Mission Duration: The Ax-4 mission is expected to last around **10-14 days**. During this time, the crew will stay aboard the ISS, working alongside other astronauts and utilizing the station's facilities for their experiments and demonstrations.

Ballast Water Management Convention :

Why in news? The Ballast Water Management Convention (BWMC) was recently in news.

About BWMC:

- The Ballast Water Management Convention is an international treaty adopted by the International Maritime Organization (IMO) in 2004.
- It aims to prevent the spread of harmful *aquatic organisms* from one region to another via ships' ballast water.

2. Purpose:

- Ships use ballast water for stability, but when this water is taken on in one ecological zone and released in another, it can introduce invasive species that disrupt local ecosystems.
- The BWMC sets standards to ensure that ballast water is treated to eliminate or reduce these risks.

About Ballast water:

- It is water that ships carry in their ballast tanks to maintain stability, balance, and structural integrity during voyages.
- This water is taken on board to provide balance when the ship is not carrying cargo, has unloaded cargo, or needs extra stability in rough seas.

3. Key Provisions:

Ballast Water Treatment: Ships must treat their ballast water to meet the standards set by the BWMC, either by installing on-board treatment systems or by discharging ballast water to onshore facilities.

Ballast Water Exchange: Before the adoption of treatment standards, the convention required that ballast water be exchanged mid-ocean to reduce the risk of invasive species, as oceanic organisms are less likely to survive in coastal waters.

D-1 and D-2 Standards: The convention introduced two performance standards:

D-1 Standard: Refers to ballast water exchange, where ships exchange their ballast water at sea.

D-2 Standard: Requires that ships meet specific limits on the concentration of living organisms in ballast water before discharge.

Implementation Schedule: The convention provided a timeline for existing ships to comply with the D-2 standard, while new ships were required to meet the standard from their delivery.

4. Entry into Force:

- The BWMC entered into force on September 8, 2017, after being ratified by a sufficient number of countries representing a significant percentage of the world's merchant shipping tonnage.

5. Compliance and Enforcement:

- Ships are required to carry a Ballast Water Management Plan and a Ballast Water Record Book. Compliance is enforced by port state control inspections, which may include sampling of ballast water.

6. Global Impact:

- The BWMC has had a significant impact on the global shipping industry, requiring investments in new technologies and changing operational practices. The goal is to protect marine environments from invasive species, which can cause significant ecological and economic damage.

7. Challenges and Criticisms:

- Some have criticized the BWMC for the cost and complexity of compliance, particularly for older ships. There have also been challenges related to the effectiveness of ballast water treatment systems under different operating conditions.
- The Ballast Water Management Convention represents a major international effort to protect the marine environment from the spread of invasive species through shipping activities.

Galathea Bay – Great Nicobar Island:

Why in News? A wildlife sanctuary in Galathea Bay, Great Nicobar Island, was denotified to clear the way for a transshipment port project. The area, a significant nesting site for endangered species like the giant leatherback turtle, was originally classified as a CRZ-1A zone, where large construction projects are prohibited.

About the CRZ:

- The Coastal Regulation Zone (CRZ) classification in India is part of the Coastal Regulation Zone Notification issued under the Environment Protection Act, 1986. The CRZ classification is designed to protect the coastal environment while allowing sustainable development.

CRZ Classification:**CRZ-I: Ecologically Sensitive Areas:**

Definition: Areas that are ecologically sensitive and vulnerable, such as mangroves, coral reefs, salt marshes, and turtle nesting sites.

Restrictions: Strict regulations are imposed on development in these areas to preserve their ecological balance.

Examples:

Sundarbans (West Bengal): Known for its mangrove forests and unique biodiversity.

Gahirmatha Marine Sanctuary (Odisha): Important for olive ridley sea turtle nesting.

CRZ-II: Developed Areas:

Definition: Areas that are already developed or are designated for development, including urban areas and areas where infrastructure is already established.

Restrictions: Development is permitted with conditions to ensure it does not adversely affect the coastal environment. Regulations are less stringent compared to CRZ-I.

Examples:

Mumbai (Maharashtra): A densely populated urban area with extensive coastal development.

Chennai (Tamil Nadu): An example of an urban coastal area with existing infrastructure.

CRZ-III: Rural and Semi-Urban Areas:

Definition: Areas that are largely rural or semi-urban, typically characterized by low population density and limited development.

Restrictions: Development is allowed subject to conditions to minimize the impact on the coastal environment. Restrictions include maintaining a buffer zone from the high tide line.

Examples:

Kochi (Kerala): Semi-urban areas with a mix of developed and rural characteristics.

Pondicherry (Union Territory): Coastal areas with a blend of rural and semi-urban settings.

CRZ-IV: Coastal Waters:

Definition: Areas in the coastal waters, including the territorial waters up to 12 nautical miles from the baseline.

Restrictions: This zone includes the sea and its adjoining water bodies, where regulations focus on controlling activities that impact marine life and coastal ecosystems.

Examples:

Goa's Coastal Waters: Includes marine areas crucial for the fishing industry and marine biodiversity.

Andaman and Nicobar Islands' Waters: Important for protecting unique marine ecosystems.

Mpox Or Monkeypox:

Why in news? Mpox, formerly known as monkeypox, has been in the news due to its emergence in many countries mostly affecting the Democratic Republic of Congo and neighbouring countries.

What is Mpox?

- Mpox is a viral infection caused by the mpox virus, a member of the Orthopoxvirus genus, which also includes the variola virus (which causes smallpox) and the vaccinia virus (used in smallpox vaccines). Mpox is characterized by symptoms similar to smallpox but generally less severe.

History:

First Identified: Mpox was first identified in laboratory monkeys in 1958, hence its name. The first human case was reported in the Democratic Republic of the Congo (DRC) in 1970.

Endemic Regions: Traditionally, mpox was considered endemic to Central and West Africa, with outbreaks occurring periodically in these regions.

Global Spread: In 2022, there was a significant global outbreak, with cases reported in countries outside the traditional endemic regions, including Europe, North America, and parts of Asia. This spread led to increased international concern and a global health response.

Symptoms:

Mpox symptoms are similar to smallpox but usually milder. They include:

- Fever
- Headache
- Muscle aches
- Backache
- Swollen lymph nodes
- Chills
- Exhaustion
- A rash that typically starts on the face and then spreads to other parts of the body

Variants:

Mpox has different genetic clades or variants. The two primary clades are:

1. **Central African (Congo Basin) Clade:** Generally more severe and has a higher mortality rate.
2. **West African Clade:** Typically milder and has a lower mortality rate.

The 2022 outbreak highlighted the presence of both clades in new regions, adding complexity to the response efforts.

Vaccination:

Two vaccines currently in use for small pox and Mpox namely, (JYNNEOS vaccine and ACAM2000) are recommended by WHO's Strategic Advisory Group of Experts on Immunization,

Gross Environment Product Index

Why in News? Uttarakhand has become the first Indian state to launch a Gross Environment Product Index .

Components of the GEP Index:

The GEP Index is based on four key pillars: air, soil, trees, and water.

These pillars represent essential components of the environment that are crucial for maintaining ecological balance and human well-being.

The formula used to calculate GEP is as follows:

GEP Index = (Air-GEP Index + Water-GEP Index + Soil-GEP Index + Forest-GEP Index)

- This formula allows for a comprehensive evaluation of the environment's overall health by integrating various environmental factors into a single index.

Air:

- The air component of GEP assesses air quality and the impact of human activities on atmospheric health.
- It considers both pollution levels and efforts to reduce emissions or enhance air purification through natural or engineered processes.

Soil:

- Soil health is a critical indicator in the GEP Index.
- It measures the quality of soil, considering factors such as fertility, contamination levels, and soil conservation practices.
- The aim is to ensure that the soil remains productive and capable of supporting agriculture and natural vegetation.

Trees (Forest):

- The forest component of GEP goes beyond simply counting the number of trees.
- It evaluates the types of trees planted, their survival rates, and their ecological value.
- For instance, broad-leafed trees, which are more beneficial for the environment, receive greater weightage in the index compared to less preferred species like pine.
- This approach encourages the planting of more ecologically valuable trees and ensures sustainable forest management practices.

Water:

- The water component examines both natural and human-made water bodies, assessing their quantity and quality.
- It includes the evaluation of water conservation efforts, such as the creation of man-made reservoirs like Amrit Sarovars, and compares them with natural water sources like rain-fed lakes and rivers.
- The index aims to reflect the overall water availability and the effectiveness of conservation initiatives.

Godda Project

Why in News? India made changes to its rules about exporting electricity to other countries, in August 2024. These changes were made to protect Indian companies from political risk in countries like Bangladesh.

What is the Godda Project?

- Adani Power runs a very large power plant in **Godda, Jharkhand**, that can produce **1,496 megawatts (MW)** of electricity. This entire amount of electricity is sent to Bangladesh.
- The project began in 2017 when Adani Power signed a 25-year agreement with the Bangladesh Power Development Board (BPDB).
- This agreement, called a **Power Purchase Agreement (PPA)**, marked India's first project that sends electricity across borders to another country.

What is Power Purchase Agreement (PPA)?

- A Power Purchase Agreement (PPA) is a long-term contract between a power producer and a customer that defines the conditions for the purchase of electricity.
- PPAs can be used in a variety of situations, such as when a customer wants to secure a supply of power, or when a renewable energy project might not be viable without a guarantee of price and quantity.
- PPAs can also help to reduce market price risks, finance the construction and operation of renewable energy plants, and ensure follow-up financing for existing power plants..

Green Tug Transition Program (GTTP):

Why in News? Recently, the Union Minister of Port Shipping and Waterways officially launched the Standard Operating Procedure (SOP) for **Green Tug Transition Program (GTTP)**.

About GTTP:

- The **Green Tug Transition Programme** is an initiative aimed at reducing the environmental impact of maritime activities, specifically focusing on the decarbonization of tugboats, which are essential for port operations and maritime logistics.

Tugboats traditionally rely on diesel engines, contributing to significant greenhouse gas emissions.

The Green Tug Transition Programme seeks to transition these vessels to more sustainable energy sources, such as hybrid or fully electric propulsion systems.

- The program is part of broader efforts to promote green shipping and reduce carbon emissions in the maritime sector.
- It typically involves retrofitting **existing tugboats with cleaner technologies** or building new tugs designed with sustainability in mind.
- These initiatives are often supported by government policies, international regulations, and **collaborations between maritime industries** and environmental organizations.

About Standard Operating Procedure (SOP):

- It is a set of step-by-step instructions or guidelines that are created by an organization to help workers carry out routine operations.
- SOPs aim to ensure **consistency, efficiency, quality, and safety** in the execution of specific tasks. They are used across various industries, including manufacturing, healthcare, government, and service sectors.

UPS/NPS/OPS

Why in News? The recent approval of the Unified Pension Scheme (UPS) by the Union Cabinet highlights the government's effort to balance financial sustainability with providing assured pensions to government employees.

The Unified Pension Scheme (UPS), National Pension Scheme (NPS), and Old Pension Scheme (OPS) are three different pension schemes in India, each with distinct features, benefits, and structures. Here's a detailed comparison of these schemes:

1. Old Pension Scheme (OPS):

Features:

Defined Benefit Scheme: The Old Pension Scheme is a defined benefit plan, meaning the pension amount is pre-determined and not linked to the contributions made by the employee during their service.

Pension Calculation: The pension under OPS is typically calculated as 50% of the last drawn salary. It also includes provisions for dearness allowance (DA), which is revised periodically to keep up with inflation.

Funding: The OPS is entirely funded by the government, with no contribution required from the employee.

Applicability: OPS was applicable to government employees who joined service before January 1, 2004. Post-2004, it was replaced by the NPS for new entrants in government services.

Guaranteed Pension: OPS offers a guaranteed pension for life, along with benefits to the spouse or dependents in case of the pensioner's demise.

Pros:

Guaranteed pension amount.

- Adjusted for inflation through DA.
- No financial contribution required from the employee.

Cons:

- Financial burden on the government due to the rising pension liability.
- Unsustainable in the long term due to increasing life expectancy and the number of retirees.

2. National Pension Scheme (NPS):

Features:

Defined Contribution Scheme: NPS is a defined contribution plan, where both the employee and the employer contribute towards the pension fund during the employee's working life.

Pension Calculation: The pension amount is not fixed and depends on the amount contributed by the employee, the performance of the pension fund, and the annuity purchased at the time of retirement.

Contributions: Typically, the employee contributes 10% of their salary (basic + DA), and the government or employer matches this contribution with an additional 10%.

Market-Linked Returns: The returns on the NPS are market-linked, as the funds are invested in equities, corporate bonds, and government securities.

Withdrawals: At retirement, the employee can withdraw 60% of the corpus as a lump sum (tax-free), while the remaining 40% must be used to purchase an annuity to provide a regular pension.

Applicability: NPS is mandatory for government employees who joined service on or after January 1, 2004. It is also open to the general public on a voluntary basis.

Pros:

- Portable across jobs and locations.
- Offers market-linked returns, potentially higher than OPS.
- Flexibility in choosing the pension fund manager and investment options.

Cons:

- No guaranteed pension amount; returns depend on market performance.
- Requires financial literacy to make informed choices about fund managers and investment allocations.
- The pension amount may vary significantly based on market conditions at the time of retirement.

3. Unified Pension Scheme (UPS):

Features:

Hybrid Scheme: The Unified Pension Scheme (UPS) is designed to combine the features of both the OPS and NPS, aiming to provide a balanced pension solution.

Pension Calculation: UPS aims to offer a guaranteed minimum pension like the OPS, while also incorporating market-linked returns from NPS.

Contributions: Like NPS, the UPS involves contributions from both the employee and employer, but with an added guarantee from the government to provide a minimum pension amount.

Market-Linked Returns: Similar to NPS, the funds in UPS may be invested in a mix of assets, offering the potential for higher returns, but with a safety net ensuring a baseline pension amount.

Applicability: The UPS is a relatively new proposal and is intended to be implemented for future entrants into government services and possibly other sectors. It is still in the discussion and development stages.

Pros:

- Offers the security of a guaranteed minimum pension.
- Potential for higher returns through market investments.
- Addresses concerns of sustainability that plagued the OPS.

Cons:

- Complexity in implementation due to its hybrid nature.
- May require ongoing government support to ensure the guaranteed pension, leading to financial commitments.

Summary:

Old Pension Scheme (OPS): A traditional pension scheme offering guaranteed benefits based on the last drawn salary, but financially burdensome for the government.

National Pension Scheme (NPS): A modern, market-linked pension scheme with contributions from both the employee and employer, offering flexibility but with no guaranteed returns.

Unified Pension Scheme (UPS): A proposed hybrid scheme aiming to balance the guaranteed benefits of OPS with the market-linked returns of NPS, though still in development.

Asia Power Index 2024

Why in News- India has recently achieved a significant milestone in the Asia Power Index, surpassing Japan to become the third most powerful country. This shift is a sign of India's growing geopolitical status, active development and rapidly growing economy.

Key factors for India's rise:

1. Economic growth-

- India made rapid economic reforms after the pandemic, which increased its economic potential by 4.2 points.
- India has been recognized as the third largest economy in the world in terms of GDP and purchasing power parity (PPP).
- Due to its large and young population, India's economic growth prospects may increase even more in the coming decades.

2. Future prospects-

- India's future resource score has seen an increase of 8.2 points, which is a result of its young demographic dividend.
- India's young population puts it ahead of other major Asian countries, such as China and Japan. This population will continue to boost the labor force in the years to come.

3. Diplomatic influence-

- Under the leadership of Prime Minister Narendra Modi, India has done effective diplomacy on international forums, under which the non-alignment strategy has given it global recognition.
- India ranked sixth in diplomatic dialogues in 2023, which reflects its increasing participation in multilateral forums.

- India has played an important role in security initiatives like Quad, which has further increased its contribution to the regional security system.

Defense cooperation and economic reach-

- India signed a BrahMos missile deal with the Philippines, which symbolizes its growing steps in defense capabilities and defense exports in the region.
- Although India stays away from formal military alliances, it has focused on strengthening its defense policy and increasing its power in the neighboring countries.
- **India's role in Asia-**
 - With India's growing economic and diplomatic strength, it is being seen as a major power in the Indo-Pacific region.
 - The Asia Power Index has reflected India's growing power, and it is expected that India will increase its influence even more in the future.
 - India's strategic autonomy and its participation in multilateral diplomacy make it an important country in global politics.

Philadelphia Corridor

Why in News?-The Philadelphia Corridor is a key issue in ceasefire talks as Israel's war on Gaza continues, killing nearly 41,000 Palestinians.

About the Philadelphia Corridor-

- The Philadelphia Corridor is a strategically important land strip between the Gaza-Egypt border.
- It is approximately 14 kilometers long and 100 meters wide.
- The region plays a key role in regional security and geopolitics around Gaza, Israel and Egypt.



- It stretches from the Mediterranean Sea in the north to the Kerem Shalom crossing with Israel in the south.
 - It also includes the Rafah Crossing, which is the main border point between Gaza and Egypt.
- It serves as a buffer zone between Egypt and Gaza, and control over it has an impact on security and smuggling activities in the region

Explosives Act, 1884

Why in News ? On 9 Sep, 2024 night a deliberate attempt was made to derail the Kalindi Express by placing a gas cylinder on the route. The FIR has been lodged against some unidentified people under **Bhartiya Nyaya Sanhita sections 287,125 and provisions of explosive act, 1884.**

About Explosives Act, 1884:

- The Explosives Act of 1884 is a legislation enacted by the British colonial government in India, primarily aimed at regulating the manufacture, storage, possession, use, sale, import, and export of explosives. The Act was later amended several times to accommodate technological advancements and changing safety standards.
- The Explosives Act of 1884 empowers **designated authorities to conduct inspections** of premises where explosives are stored or used to ensure compliance with safety regulations. It also outlines **penalties for violations of the Act**, which may include fines and imprisonment.
- The Act applies to various types of explosives, including gunpowder, dynamite, nitroglycerin, and other similar substances.

- It lays down **safety standards and procedures to prevent accidents** and mishaps related to explosives. This includes guidelines for handling, transportation, and storage of explosives to minimise the risk of accidents.
- Over the years, the Explosives Act has been amended to address emerging challenges and technological advancements. These amendments often focus on enhancing safety standards, improving regulatory mechanisms, and updating definitions to encompass new types of explosives.

About the draft Explosives Bill, 2024:

- The government is planning to introduce the draft Explosives Bill, 2024, as a replacement for the Explosives Act, 1884, which it aims to revoke.
- According to a report in a document open for public consultation, the Department for Promotion of Industry and Internal Trade (DPIIT) has proposed raising fines for violation of regulations and enhancing the efficiency of licensing procedures.
- Explosives encompass **gunpowder, nitroglycerin, nitroglycol, dinitrotoluene, and picric acid**.
- According to the proposed Explosives Bill 2024, the Union government will designate the authority responsible for granting, suspending, or revoking licences, as well as carrying out other specified functions under the new legislation.
- Currently, the **Petroleum and Explosives Safety Organisation (PESO)** operating under the DPIIT is the regulatory body responsible for issuing licences for the manufacture, possession, use, sale, import, and export of any explosive material.
- The proposed bill also suggests that the licensing authority would specify in the licence the quantity of explosives that a licensee can manufacture, possess, sell, transport, import, or export, for a specified period, as prescribed.
- Under the provisions of the draft bill, if a licensee engages in manufacturing, importing, or exporting in violation of any regulations, they may face imprisonment for up to three years, a fine of Rs 1,00,000, or both. In contrast, the current Explosives Act stipulates a prison term of **three years and a fine of Rs 50,000** for such violations.
- Under the provisions of the new bill, if someone is found in possession, using, selling, or transporting any explosive in violation of the regulations, they may face imprisonment for up to two years, a fine of Rs **50,000, or both. In the current legislation, the fine stands at Rs 3,000.**

About Petroleum & Explosives Safety Organization (PESO):

- It is an organization under Department of industrial policy and promotion (DIPP), Ministry of commerce & Industry.
- It administers the usage of explosives & petrol stations in India.
- Headquarters: **Nagpur, Maharashtra.**

Teal carbon:

India's first study on 'teal carbon', undertaken at Keoladeo National Park (KNP) in Rajasthan's Bharatpur district, has highlighted the significance of wetland conservation to address the challenges of climate adaptation and resilience.

About it:

- Teal carbon refers to the carbon stored in aquatic ecosystems, particularly in freshwater bodies such as lakes, rivers, wetlands, and streams. It complements other types of carbon storage such as:

Blue carbon: Found in marine and coastal ecosystems like mangroves, salt marshes, and seagrasses.

Green carbon: Stored in terrestrial ecosystems, primarily forests and grasslands.

Key Points about Teal Carbon:

Carbon Sequestration: Aquatic ecosystems can capture and store carbon from the atmosphere, thereby helping mitigate climate change.

Sources of Carbon: Organic matter such as dead plant material and soil erosion that enters freshwater bodies plays a significant role in carbon cycling.

Threats: Teal carbon reserves are under threat from pollution, damming of rivers, land use changes, and climate change, which can cause the release of stored carbon into the atmosphere.

Importance: The recognition of teal carbon emphasizes the broader role of all aquatic ecosystems in the global carbon cycle, not just marine ones.

Golden city' club/Swabhav Swachhata Sanskaar Swachhata (4S):

Why in News ? The government will set up a 'golden city club' to give more states a change to rank top among those with the cleanest cities.

- Indore won the title of India's cleanest city for the seventh consecutive year in 2023.

- The government also aims to clean 200,000 difficult and dirty spots during the 4S campaign, the theme of Swachh Bharat Mission this year.

About Swabhav Swachhata Sanskaar Swachhata (4S):

- In a significant move for the Swachh Bharat Mission (SBM), the government has announced a focused campaign for 2024, aiming to tackle around 200,000 of the most challenging and dirty spots across India.
- This new initiative, dubbed the " campaign, will run from September 17 to October 2, 2024, and marks the mission's 10th anniversary.
- this year's campaign is a major step forward, moving from the previous focus on 'Cleanliness is Service' to 'Cleanliness as Swabhav & Sanskaar.'
- The campaign will concentrate on **Cleanliness Target Units (CTUs)**, which include difficult and dirty spots like **tourist locations, public buildings, commercial areas, and community toilets**.
- Central Public Sector Units (PSUs), industry partners, and non-governmental organizations (NGOs) are being encouraged to adopt and clean these CTUs.
- The aim is to enhance public spaces through collaborative cleanliness drives and community involvement.
- there are approximately **2,300 dumpsites** in urban areas, holding around 22 crore metric tons of waste.
- So far, **427 dumpsites with 9 crore metric tons of waste** have been remediated, reclaiming 4,500 acres of land. The mission is now focusing on improving waste collection and processing methods.
- Over 93% of women now have access to toilets, and the mission has contributed to a reduction in infant mortality by about three lakh in the past five years.

The 2024 campaign is built around three main pillars:

1. **Swachhata Ki Bhaagidari**: Encouraging public participation and raising awareness about cleanliness.
2. **Sampoorna Swachhata**: Conducting large-scale cleanliness drives targeting the most challenging and dirty areas.
3. **SafaiMitra Suraksha Shivar**: Providing safety and welfare services for sanitation workers, including health camps and recognition programs.

The campaign embraces a 'Whole of Society' approach, involving citizens, businesses, NGOs, and local bodies. It also adopts a ' , with participation from all States, Union Territories, and Central Ministries.

The campaign will culminate on October 2, the birth anniversary of Mahatma Gandhi, marking a decade of transformative efforts under the Swachh Bharat Mission.

OpenAI's project Strawberry/OpenAI o1

Why in News? The OpenAI's project Strawberry, it is now officially called OpenAI o1. On September 12, the company fully unveiled the new AI model that thinks before responding. According to OpenAI, the model can reason through complex tasks and solve harder problems than previous models in science, coding, and math.

While it is the first of this series in ChatGPT, OpenAI expects to add regular updates and improvements. But all of this comes at a higher price.

What is it and how does it work?

- OpenAI's o1 model marks a significant stride. According to the company, the model is a progressive step toward achieving human-like AI.
- It also demonstrates tangible improvements in key areas, such as generating code and tackling complex, multistep challenges with greater proficiency than its predecessors.
- OpenAI, in the release, stated that it has trained these models to spend more time thinking through problems before it responds, much like a human would.

Through training, it learned to refine their thinking process, try different strategies, and recognise their mistakes. Adding on, it says that the model excels in math and coding. In fact, in the upcoming update, the OpenAI o1 performs similarly to PhD students in challenging benchmark tasks in physics, chemistry, and biology.

Operation Sadbhav /Typhoon Yagi:

Why in News? India has launched Operation Sadbhav to provide humanitarian assistance to Southeast Asian countries affected by Typhoon Yagi, including **Vietnam, Laos and Myanmar**.

About Typhoon Yagi:

- It began as a tropical storm in the western Philippine Sea on September 1, 2024.
- Yagi, which means goat or the constellation of Capricornus in Japanese.
- It made landfall in the Philippines but intensified again due to warm waters in the South China Sea, reaching Category 3 winds by September 4.

Yagi further strengthened to a Category 5 typhoon with peak winds of 260 kmph, making it one of only four **Category 5 storms recorded in the South China Sea**.

Other Major Cyclones in Asia:**Cyclone Amphan (2020):**

Formation: Formed in the Bay of Bengal in May 2020.

Impact: One of the most powerful cyclones to hit the region in recent years, Amphan caused widespread destruction in **India and Bangladesh**. It brought heavy rains, high winds, and significant flooding, resulting in extensive damage to infrastructure and agriculture.

Cyclone Idai (2019):

Formation: Developed in the Indian Ocean and struck Mozambique in March 2019.

Impact: Idai was one of the most devastating cyclones to hit southern Africa in recent history. It caused catastrophic flooding, displaced thousands of people, and resulted in significant loss of life and property.

Cyclone Hudhud (2014):

Formation: Originated in the Bay of Bengal in October 2014.

Impact: Hudhud struck the eastern coast of India, particularly affecting Andhra Pradesh and Odisha. It caused extensive damage, with strong winds and heavy rain leading to flooding and infrastructure damage.

Cyclone Nargis (2008):

Formation: Formed in the Bay of Bengal and made landfall in Myanmar in May 2008.

Impact: Nargis was one of the deadliest cyclones to hit Myanmar, causing widespread devastation. The cyclone resulted in thousands of deaths and significant damage to infrastructure and agricultural land.

Typhoon Haiyan (Yolanda) (2013):

Formation: Developed in the Western Pacific Ocean in November 2013.

What is soft landing & hard Landing?

Why in News? American consumers and home buyers, business people and political leaders have been waiting for months for what the Federal Reserve is poised to announce this week: That it's cutting its key interest rate from a two-decade peak.

Will the Federal Reserve cut interest rates fast enough to deliver a 'soft landing'?

What is soft Landings?

When the Federal Reserve is concerned about inflation, it raises interest rates to slow the pace of economic growth. If the Fed raises interest rates a lot, it may cause a recession – known as a hard landing. However, if the Fed can raise interest rates just enough to slow the economy and reduce inflation without causing a recession, it has achieved what is known as a soft landing.

Soft Landing:

- A soft landing occurs when an economy slows down after a period of rapid growth or high inflation without falling into a recession.
- Central banks, like the Reserve Bank of India (RBI) or the Federal Reserve (Fed), raise interest rates or tighten monetary policy to control inflation or prevent overheating.
- In a soft landing, economic growth moderates, inflation stabilizes, but unemployment remains relatively low, and output continues growing, albeit at a slower pace.
- It's a delicate balancing act where policy adjustments curb inflation and excesses without significant negative impacts on employment or GDP.

Example of Soft Landing:

- The **U.S. economy in the mid-1990s** is often cited as an example, when the Federal Reserve increased interest rates to control inflation, yet the economy continued to grow without entering a recession.

2. Hard Landing:

- A hard landing refers to a more abrupt and severe economic slowdown, often leading to a recession.
- This occurs when central banks tighten monetary policy too aggressively, causing a sharp contraction in economic activity.
- A hard landing is characterized by falling GDP, higher unemployment, declining consumer demand, and often a recession.
- It can happen if the measures to control inflation or curb excessive growth are too strong or mistimed, leading to a sudden halt in economic momentum.

Example of Hard Landing:

The Global Financial Crisis of 2008 saw many economies experience a hard landing due to the collapse of financial markets, leading to a severe economic recession.

Article 172(2)(b) of the Indian Constitution

Why in News? The Delhi government wants to early assembly election.

What does the law say ?

- The **Section 15(2) of the Representation of the People Act, 1950** says that the election can not be notified less than 6 months before the end of term of assembly unless it is dissolved before it completes its term.

- **Article 172(2)(b) of the Indian Constitution** pertains to the tenure of the members of the State Legislative Assemblies and relates to provisions regarding their extension in special circumstances.

Article 172(2)(b) (in context of Article 172):

Article 172(1) specifies that the term of a State Legislative Assembly is five years from the date of its first meeting, unless dissolved earlier.

Article 172(2) provides for an extension of this five-year term in exceptional situations, specifically:

Clause (b) allows the term to be extended by Parliament for one year at a time during a national emergency proclaimed under Article 352 of the Constitution. This extension can continue while the emergency is in effect, but it cannot exceed six months after the emergency has ended.

Key points of Article 172(2)(b):

Extension of Legislative Assembly's tenure: The normal five-year term of a Legislative Assembly can be extended beyond five years during a national emergency.

Limitations: Each extension can only be for one year at a time.

Post-emergency limit: Once the national emergency is over, the extension cannot exceed six months.

Precision Farming:

Why in News? The Indian government plans to invest Rs 6,000 crore in promoting precision farming. This includes smart technologies like AI, IoT, and drones to optimize agricultural inputs and increase productivity while reducing environmental impact.

About Precision farming:

- Precision farming (also known as precision agriculture) is a modern agricultural technique that uses advanced technology and data-driven approaches to optimize crop production and farming practices.
- The goal of precision farming is to increase efficiency, reduce waste, and improve crop yields by making precise decisions based on the specific needs of different areas within a farm.

Key Features of Precision Farming:

Data Collection:

- Precision farming relies on gathering real-time data from various sources like satellites, sensors, drones, GPS systems, and field monitors.
- This data includes soil conditions, moisture levels, crop health, and weather patterns, providing detailed insights into the farm's environment.

Site-Specific Management:

- Farmers can manage crops at a micro level rather than applying the same practices uniformly across large fields.
- This includes variable rate applications of inputs like water, fertilizers, pesticides, and seeds based on the specific requirements of different areas.

Use of Technology:

- GPS-guided equipment helps in precision planting, tilling, and harvesting.
- Remote sensing and drones are used to monitor crop health, detect diseases, and assess plant growth.
- IoT sensors can be placed in fields to monitor soil conditions, water usage, and plant needs in real-time.

Decision Support Systems:

- Data analysis and machine learning algorithms are used to predict outcomes, manage risks, and optimize farming strategies.
- Farmers can make informed decisions about planting times, irrigation schedules, pest control, and harvesting.

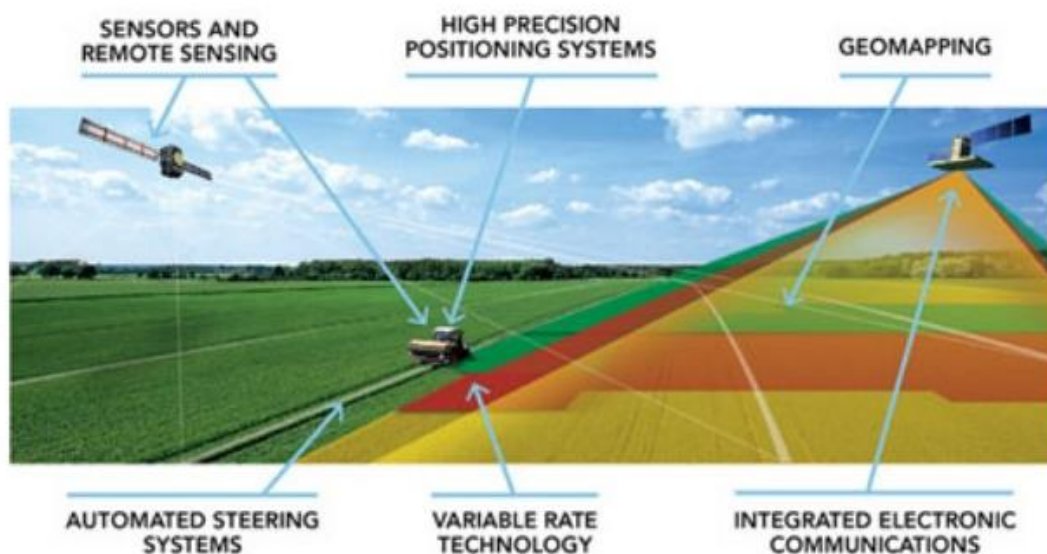
Benefits of Precision Farming:

- **Increased productivity:** Precision farming helps in optimizing the use of resources, leading to higher crop yields.
- **Reduced input costs:** By applying the exact amount of fertilizers, water, and pesticides only where needed, input costs are reduced.
- **Sustainability:** Precision farming promotes the efficient use of natural resources, reducing environmental impact and encouraging sustainable agricultural practices.
- **Minimized environmental footprint:** Reduced use of chemicals and water helps in lowering pollution and conserving natural resources.
- **Real-time monitoring:** Continuous monitoring of crops and soil allows early detection of problems like pest infestations or nutrient deficiencies.

Steps taken:

- The **National Mission on Sustainable Agriculture (NMSA)** and **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)**, which focus on water-use efficiency and soil health monitoring.
- The government has also promoted the use of drones, soil health cards, and satellite-based monitoring.
- The government has also announced a **Digital Public Infrastructure (DPI)** for agriculture that will provide farmers with access to technology and information.

- PF technology is being developed and disseminated through the 22 Precision Farming Development Centres in the country.
- The **Agriculture Infrastructure Fund (AIF)**, launched during Covid-19, has provisions for financing infrastructure projects for smart and precision agriculture.



Relative Economic Performance of Indian States: Report -1960-61 to 2023-24' :

Why in News ? It was recently presented by Economic Advisory Council to the Prime Minister(EAC-PM):

Key facts about the Performance Report:

- The development of eastern part of the country remains a concern.
- The maritime states have clearly outperformed other states, with the exception of West Bengal.
- Although Bihar's relative position has stabilized in the last two decades, it remains significantly behind other states and requires much faster growth to catch up.
- Conversely, Odisha, traditionally a laggard, has shown a marked improvement in recent years.

- **"West Bengal**, which held the third-largest share of national GDP at **10.5 per cent** in **1960-61**, **now accounts for only 5.6 per cent** in 2023-24. It has seen a consistent decline throughout this period.
- West Bengal's per capita income was above the national average in **1960-61 at 127.5 per cent**, but its growth failed to keep pace with national trends. As a result, its relative per capita income declined to **83.7 per cent in 2023-24**, falling below that of even traditionally laggard states like **Rajasthan and Odisha**.
- The western and southern regions of India have performed notably better than other parts of the country from **1960-61 to 2023-24**.
- Southern states have significantly outpaced others after economic liberalization in 1991, with the five states -- **Karnataka, Andhra Pradesh, Telangana, Kerala and Tamil Nadu** -- collectively accounting for approximately 30 per cent of India's GDP in 2023-24.
- **"Before 1991, southern states did not show** exceptional performance. However, since the economic liberalization of 1991, southern states have emerged as the **leading performers**.
- In addition, per capita income of all southern states became higher than the **national average after 1991**.
- The paper also noted that in the north, states **like Delhi and Haryana** also stood out. "Delhi has one of the highest per capita incomes throughout the study period."
- As per the paper, **Maharashtra, West Bengal and Tamil Nadu** were home to **India's 3 largest industrial clusters in the 1960s**.
- "Their fortunes subsequently diverged- Maharashtra showed broadly steady performance throughout, West Bengal's share has been in continuous decline. After a decline, Tamil Nadu picked up post-1991.
- All data used are in current prices and the analysis spans 1960-61 to 2023- 24, providing insights into how individual states have performed in response to changes in national and state-specific.

What's White Paper?

Why in News ? The Delhi BJP president has recently demanded White Paper in scrapped excise policy>

What's White Paper?

In contrast, a White Paper provides comprehensive information, analysis, and proposals on a specific topic or issue. It aims to inform decision-making processes, propose solutions, or

present recommendations for action. It's often produced by governments, organizations, or experts to shape the policy.

- A White Paper serves as a crucial tool for informing policymakers, stakeholders, and the public about the government's policies, initiatives, and their intended impact on the economy. It offers a detailed assessment of economic indicators, reforms, and their implications for various sectors.

Characteristics of White Papers:

Comprehensive Information: Offers detailed and comprehensive information on a particular topic, issue, or policy.

Objective Tone: Maintains an objective and neutral tone, presenting information and analysis without strong opinions or biases.

Policy Recommendations: May include proposals or recommendations for policy changes, initiatives, or reforms based on thorough analysis and research.

Authoritative Sources: Often cites authoritative sources, research findings, and expert opinions to support arguments and recommendations.

Educational and Informative: Aims to educate stakeholders, policymakers, and the public about complex issues, providing insights and analysis to facilitate informed decision-making.

What's Black Paper?

A Black Paper presents a critical or dissenting viewpoint on a particular topic, issue, or policy. It challenges prevailing narratives, policies, or viewpoints through critical analysis, addressing controversial subjects, providing evidence, and proposing alternative approaches.

Characteristics of Black Papers:

Critical Analysis: Involves critical analysis and evaluation of existing policies, practices, or viewpoints.

Oppositional Stance: Expresses opposition or dissent, challenging prevailing narratives or perspectives.

Controversial Topics: Often addresses contentious or controversial topics, offering alternative viewpoints or interpretations.

Evidence-Based Arguments: Relies on evidence, data, and logical arguments to support critical assessment and perspective.

Advocacy for Change: May advocate for policy changes, reforms, or alternative approaches to address perceived deficiencies or injustices.

- The **U.S. economy in the mid-1990s** is often cited as an example, when the Federal Reserve increased interest rates to control inflation, yet the economy continued to grow without entering a recession.

Hard Landing:

- A hard landing refers to a more abrupt and severe economic slowdown, often leading to a recession.
- This occurs when central banks tighten monetary policy too aggressively, causing a sharp contraction in economic activity.
- A hard landing is characterized by falling GDP, higher unemployment, declining consumer demand, and often a recession.
- It can happen if the measures to control inflation or curb excessive growth are too strong or mistimed, leading to a sudden halt in economic momentum.

Example of Hard Landing:

The Global Financial Crisis of 2008 saw many economies experience a hard landing due to the collapse of financial markets, leading to a severe economic recession.

COP29 : Climate Action Fund:

Why in News? COP29 host Azerbaijan has called on nations to commit to a six-fold increase in global energy storage capacity from 2022 levels, aiming for 1,500 gigawatts by 2030.

- This proposal was outlined in a letter by President-Designate Mukhtar Babayev to all participating countries ahead of the UN climate conference in Baku in November.
- Babayev also suggested the creation of a climate action fund which would be supported through voluntary contributions from fossil fuel-producing countries and companies.
- The COP29 Presidency said that these pledges and other commitments packaged as a non-negotiated "action agenda" will supplement the formal negotiated agenda at this year's UN climate summit.
- These non-binding pledges are distinct from the formal agreements negotiated under the United Nations Framework Convention on Climate Change (UNFCCC), which require extensive consensus.

At COP29 in Baku this November, countries are required to reach an agreement on the New Collective Quantified Goal (NCQG) -- the new amount developed nations must mobilise every year starting in 2025 to support climate action in developing countries.

About the New Collective Quantified Goal (NCQG):

- It is a key element of the **Paris Agreement**, designed to set a new financial target to support developing countries in their climate **actions post-2025**.

- The NCQG seeks to fill persistent gaps in climate finance, building on the **\$100 billion target set in 2009** and aiming to provide a more realistic and ambitious financial framework.
- The NCQG aims to foster global partnerships and enhance trust and cooperation among nations, which is crucial for successfully implementing the Paris Agreement.

About the Global Climate Action Agenda (GCAA):

- It is also known as the Marrakech Partnership for Global Climate Action, was established at COP22 (the 22nd Conference of the Parties to the UNFCCC) in Marrakech, 2016.
- The Marrakech Partnership aims to enhance collaboration between governments and non-state actors, including businesses, cities, regions, investors, and civil society, to support the implementation of the Paris Agreement and to accelerate climate action.

Key Objectives of the Marrakech Partnership:

Scaling Up Climate Action: The primary goal is to boost efforts to achieve the global climate goals, particularly the Paris Agreement targets, which include limiting global warming to well below 2°C and striving for 1.5°C.

Bridging Government and Non-Government Action: The Marrakech Partnership brings together diverse stakeholders to work alongside governments in implementing climate solutions. It ensures that non-state actors play a crucial role in achieving climate goals.

Mitigation, Adaptation, and Resilience: The initiative focuses on enhancing efforts in both mitigation (reducing greenhouse gas emissions) and adaptation (helping communities and ecosystems cope with the effects of climate change), while promoting resilience in the face of climate impacts.

Sectoral and Thematic Focus: The partnership is structured around key areas like:

- Energy
- Industry
- Water
- Agriculture and food systems
- Oceans and coastal zones
- Human settlements
- Transport
- Finance

Tracking and Reporting: The Marrakech Partnership helps track progress by non-state actors toward climate goals, reporting their contributions through platforms such as the NAZCA

(Non-State Actor Zone for Climate Action) portal. This transparency helps hold actors accountable and showcase effective initiatives.

Catalyzing Finance: It also promotes the mobilization of climate finance, particularly to support vulnerable and developing countries in achieving their climate goals.

Employment-linked incentive (ELI) Scheme:

Why in News ? Labour and employment minister Mansukh Mandaviya has recently said that his ministry will soon move a Cabinet note on the **employment-linked incentive (ELI)** scheme that was announced in the budget.

About The Employment-Linked Incentive (ELI) scheme :

- It is a policy mechanism aimed at encouraging businesses and industries to create jobs and boost employment by offering financial or non-financial incentives.
- ELI programs are typically designed to address unemployment, support labor-intensive industries, and promote economic growth by linking government support directly to the creation of new jobs.

Key Features of Employment-Linked Incentive (ELI) Schemes:

Job Creation Focus: The primary objective is to incentivize employers to hire more workers, particularly in sectors that have high potential for employment generation, such as manufacturing, infrastructure, IT, textiles, and agriculture.

Financial Incentives: Under ELI schemes, businesses may receive direct financial support or subsidies, such as wage subsidies, tax breaks, or other forms of monetary incentives. These incentives are typically tied to the number of new jobs created, with the amount increasing based on the number of hires.

Skilling and Training Support: Many ELI schemes also provide incentives for businesses to invest in employee training and skill development, ensuring that new workers are adequately prepared for their roles. This aligns with the government's broader goal of improving the employability of the workforce.

Targeted Sectors: ELIs often focus on specific sectors of the economy that have the potential to absorb large numbers of workers. For example, labor-intensive industries like manufacturing, construction, or textiles may be prioritized in an ELI scheme.

Employment Conditions: To qualify for the incentives, businesses often have to meet certain conditions, such as ensuring fair wages, providing formal contracts, adhering to labor laws, and creating long-term, sustainable employment.

Regional Focus: ELI schemes may also focus on specific regions or states, particularly those that are economically lagging or have high unemployment rates. This helps in balancing regional disparities in employment opportunities.

Example of ELI in India:

In India, while Production Linked Incentive (PLI) schemes are more prominent, some sectoral initiatives have elements of employment-linked incentives. For instance:

Atmanirbhar Bharat Rozgar Yojana (ABRY): Launched during the COVID-19 pandemic, ABRY aimed to incentivize businesses to create new jobs and rehire workers who lost their jobs during the pandemic. The scheme offered subsidies to cover part of the employer's contribution to the Employee Provident Fund (EPF) for newly hired employees.

PLI with Employment Linkage: Although primarily designed to boost production, some PLI schemes for sectors like textiles and electronics have employment-linked incentives. Companies that expand production capacity and, in turn, generate more jobs may receive additional benefits.

Project 200:

Why in News ? A Bengaluru-based space-sector start-up has recently unveiled an ultra low earth orbit satellite with the capability to operate at an altitude of 200 km with the help of propulsion systems developed in-house.

The **Project 200, the satellite developed by Bellatrix Aerospace**, was unveiled by Indian National Space Promotion and Authorization Centre (IN-SPACe) Chairman Pawan Kumar Goenka.

- Usually, Low Earth Orbit satellites are deployed at an altitude of 450 km to minimize the impact of atmospheric interference. Placing satellites in lower orbits could send them hurtling towards the earth due to atmospheric drag.
- It would allow satellites to operate from this **(200 km) orbit** for years instead of deorbiting within a few days due to drag.
- Bellatrix has been working on propulsion technology for the past four years to keep satellites in 200 km orbits where the performance of the spacecraft increases significantly.
- The company claimed that, at a 200 km altitude, a satellite's capability would improve significantly as the communication latency is reduced by half, image resolution improved by three times. The cost of the satellite is also less when compared to spacecraft placed in 450 km orbits.

About Low Earth Orbit (LEO) Satellites:

Altitude: Typically orbit between 160 and 2,000 kilometers above the Earth's surface.

Characteristics:

- Lower latency due to shorter signal travel distances.
- Higher bandwidth for data transmission.

- More frequent passes over a specific location.
- Require more frequent orbital adjustments due to atmospheric drag.

Applications:

- Global positioning systems (GPS):
- Remote sensing (Earth observation, weather monitoring)
- Communication (mobile phone networks, internet connectivity)
- Scientific research

About High Earth Orbit (HEO) Satellites:

Altitude: Orbit at altitudes above 35,786 kilometers, including geosynchronous orbit (GEO) and geostationary orbit (GSO).

Characteristics:

- Longer orbital periods, often matching the Earth's rotation.
- Stationary position relative to the Earth's surface (for GEO/GSO satellites).
- Higher signal strength due to greater distance from the Earth's surface.
- Lower bandwidth compared to LEO satellites.

Applications:

- Communication (satellite TV, radio broadcasting)
- Weather forecasting
- Navigation
- Scientific research
-

About The Indian National Space Promotion and Authorization Centre (IN-SPACe) :

It is a government agency under the Department of Space in India. It was established in 2020 with the aim of promoting, facilitating, and regulating the space activities of private entities in India.

Key functions of IN-SPACe include:

Granting licenses: IN-SPACe grants licenses to private entities for various space activities, such as launching satellites, providing space-based services, and conducting space research.

Providing guidance: The agency provides guidance and support to private entities in navigating the regulatory framework and obtaining necessary approvals.

Promoting private space industry: IN-SPACe actively promotes the growth and development of the private space industry in India, fostering innovation and entrepreneurship.

Facilitating collaboration: It facilitates collaboration between private entities and government organizations involved in space activities.

Indo-Pacific Economic Framework (IPEF) :

Why in News ? India has signed two more agreements under the Indo-Pacific Economic Framework (IPEF), focusing on clean energy, anti-corruption, and trade transparency, during prime minister Narendra Modi's three-day US visit for the Quad summit 2024.

- These agreements, aimed at creating a “**clean**” and a “**fair economy**”, are expected to enhance India's sustainability efforts and strengthen its collaboration with other IPEF members including the US, Australia, Brunei Darussalam, Fiji, Indonesia, Japan.

About The Indo-Pacific Economic Framework :

- It was launched in Tokyo by the US and other Indo-Pacific countries on 23 May 2022. The group consists of 14 partner countries: Australia, Brunei Darussalam, Fiji, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, and Vietnam. Structured around four pillars—trade, supply-chain resilience, clean economy, and fair economy—the IPEF aims to foster economic growth and stability in the Indo-Pacific region

Sustainable Aviation Fuels (SAF):

Why in News ? India and Brazil have recently decided to collaborate on production and use of Sustainable Aviation Fuels (SAF).

About Sustainable Aviation Fuels (SAF):

Sustainable Aviation Fuels (SAF) are biofuels designed to reduce the environmental impact of aviation by offering a low-carbon alternative to conventional fossil-based jet fuels.

1. What are Sustainable Aviation Fuels (SAF)?

- SAFs are renewable or waste-derived aviation fuels that can significantly reduce the carbon footprint of air travel. They are produced from a variety of feedstocks, such as:

Biomass: e.g., plant oils, agricultural residues, forest waste.

Waste materials: e.g., used cooking oil, municipal solid waste, and industrial waste gases.

Non-biomass sources: e.g., carbon capture from air combined with hydrogen (Power-to-Liquid technology).

2. How is SAF Produced?

SAFs are produced through different pathways, including:

Hydroprocessed Esters and Fatty Acids (HEFA): The most commercially available pathway, using oils and fats.

Fischer-Tropsch Process: Converts solid biomass or waste into liquid fuel.

Alcohol-to-Jet (AtJ): Converts alcohol (ethanol, butanol) into jet fuel.

Power-to-Liquid (PtL): Synthesizes fuel from captured carbon dioxide and hydrogen.

3. Environmental Benefits:

Carbon Reduction: SAF can reduce life-cycle CO₂ emissions by up to 80% compared to conventional jet fuel, depending on the feedstock and production process.

Lower Particulate Matter and SO_x Emissions: SAF also emits less particulate matter and sulfur oxides, improving air quality around airports.

Sustainability: SAF production promotes the use of waste materials and avoids competition with food crops, unlike some first-generation biofuels.

Labour Force Survey Annual Report-2024 : What is Worker Population Ratio (WPR)?

Why in News? Unemployment rate for persons aged 15 years and above has remained unchanged at **3.2 per cent in July 2023 to June 2024**, according to the labour force survey annual report released recently.

Key points of the report:

- The report stated that while the UR for male has shown a marginal decline from 3.3 per cent during July 2022 June 2023 to 3.2 per cent during July 2023 June 2024, among female it has increased from 2.9 per cent to **3.2 per cent during the same time span**.
- Labour Force Participation Rate (LFPR) in usual status for persons of age 15 years and above was 60.1 per cent during July 2023 - June 2024 higher than **57.9 per cent in the previous year**.
- The same for male and female was **78.8 per cent and 41.7 per cent**, respectively.
- LFPR is defined as the percentage of persons in labour force (i.e. working or seeking or available for work) in the population.
- **LFPR for female of age 15 years** above in usual status has increased from 37.0 per cent during July 2022 June 2023 to **41.7 per cent during July 2023 June 2024**.
- For male of the same age group LFPR in usual status increased from 78.5 per cent to 78.8 per cent during the same time span.

- **Worker Population Ratio (WPR)** in usual status was **58.2 per cent during July 2023** June 2024 up from **56.0 per cent in the year ago**. The same for male and female was 76.3 per cent and **40.3 per cent respectively**.
- The WPR in usual status among female of age 15 years and above has shown an increase from 35.9 per cent during **July 2022 June 2023** to **40.3 per cent during July 2023 June 2024**.

About Worker Population Ratio (WPR):

- The **Worker Population Ratio (WPR)** is the proportion of the working population (employed individuals) to the total population of a specific age group, often those aged 15 and above.

About Labour Force Participation Rate (LFPR):

- The **Labour Force Participation Rate (LFPR)** measures the proportion of the working-age population that is either employed or actively seeking employment (the labour force).

About Unemployment Rate:

- The **Unemployment Rate** represents the percentage of people in the labour force who are unemployed but are actively seeking employment.

TRISHNA Mission

Why in News ? The 60 years of French-India space cooperation to the Gaganyaan and the TRISHNA mission was recently in news.

- TRISHNA (Thermal Infrared Imaging Satellite for High-resolution Natural resource Assessment) is a collaborative satellite mission between the Indian Space Research Organisation (ISRO) and the French Space Agency (CNES).
- The TRISHNA mission is currently scheduled for launch in 2026. The mission is a collaboration between the Indian Space Research Organisation (ISRO) and the French Space Agency (CNES). The satellite will be launched from the Satish Dhawan Space Centre by an Indian Polar Satellite Launch Vehicle (PSLV).

Key Features and Objectives of the TRISHNA Mission:

Thermal Infrared Imaging:

- TRISHNA will provide high-resolution thermal infrared images of Earth. These images will capture surface temperatures with unprecedented accuracy, allowing detailed monitoring of water stress, irrigation, urban heat islands, and other temperature-related phenomena.

Pact for the Future : United Nations

Why in News ? The World leaders recently adopted a Pact for the Future that includes a Global Digital Compact and a Declaration on Future Generations. The Pact covers a broad range of issues including peace and security, sustainable development, climate change, digital cooperation, human rights, gender, youth and future generations, and the transformation of global governance.

Significance of the pact:

- The Pact for the Future, the Global Digital Compact, and the Declaration on Future Generations will open the door to new opportunities and untapped possibilities.
- The Pact would lay the foundations for a sustainable, just and peaceful global order for all peoples and nations.

Key Pacts:

In the area of peace and security:

- The most progressive and concrete commitment to Security Council reform since the 1960s, with plans to improve the **effectiveness and representativeness of the Council**, including by redressing the historical under-representation of Africa as a priority.
- The first multilateral recommitment to **nuclear disarmament in more than a decade**, with a clear commitment to the goal of totally eliminating nuclear weapons.
- Agreement to strengthen international frameworks that govern **outer space, including a clear commitment to prevent an arms race in outer space** and the need to ensure all countries can benefit from the safe and sustainable exploration of outer space.
- Steps to avoid the **weaponization and misuse of new technologies**, such as **lethal autonomous weapons**, and **affirmation** that the laws of war should apply to many of these new technologies.

On sustainable development, climate and financing for development:

The entire Pact is designed to turbo-charge implementation of the Sustainable Development Goals.

- The most detailed agreement ever at the United Nations on the need for reform of the international financial architecture so that it better represents and serves developing countries, including:
- Giving **developing countries a greater say** in how decisions are taken at international financial institutions;

- Mobilizing more financing from multilateral development banks to help developing countries meet their development needs;
- Reviewing the sovereign debt architecture to ensure that developing countries can borrow sustainably to invest in their future, with the **IMF, UN, G20 and other key players working together**;
- Strengthening the **global financial safety net to protect the poorest** in the event of financial and economic shocks, through concrete actions by the IMF and Member States;
- On climate change, confirmation of the need to keep global temperature rise to **1.5 °C above pre-industrial levels** and to transition away from fossil fuels in energy systems to achieve **net zero emissions by 2050**.

The Global Digital Compact:

The Global Digital Compact, annexed to the Pact, is the first comprehensive global framework for digital cooperation and AI governance.

- At the heart of the Compact is a commitment to design, use and govern technology for the benefit of all.

This **includes commitments by world leaders to:**

- Connect all people, schools and hospitals to the Internet;
- Anchor digital cooperation in human rights and international law;
- Make the online space safe for all, especially children, through actions by governments, tech companies and social media;
- Govern Artificial Intelligence, with a roadmap that includes an **International Scientific Panel and a Global Policy Dialogue** on AI;
- Make data more open and accessible, with agreements on open-source data, models, and standards;
- This is also the **first global commitment to data governance, placing it on the UN agenda and requiring countries to take concrete actions by 2030**.

Youth and future generations: Declaration on Future Generations:

- The first ever Declaration on Future Generations, with concrete steps to take account of future generations in our decision-making, including a possible envoy for future generations.
- A commitment to more meaningful opportunities for young people to participate in the decisions that shape their **lives, especially at the global level**.

Human rights and gender:

- A strengthening of our work on human rights, gender equality and the empowerment of women.
- A clear call on the need to protect human rights defenders.
- Strong signals on the importance of engagement of other stakeholders in global governance, including local and regional governments, civil society, private sector and others.

Clause 6 of the Assam Accord

Why in News ? Assam Chief Minister Himanta Biswa Sarma recently chaired a meeting with All Assam Students Union (AASU) leadership to discuss the recommendations of Justice (Retd) Biplab Sarma Committee on the implementation of Clause 6 of the Assam Accord.

Speaking to the media after the meeting Chief minister Sarma said that the state government will not implement Assam accord clause 6 without consent in Barak Valley and 6th schedule areas.

About the Assam Accord :

- It is a tripartite agreement signed in **1985 between the Government of India, the Government of Assam, and the All Assam Students' Union (AASU).**
- It was a major step towards resolving the long-standing Assam agitation, which was primarily centered around the issue of illegal immigration from Bangladesh.

Key provisions of the Assam Accord:

Cut-off date: The Accord established March 25, 1971, as the cut-off date for determining the citizenship status of individuals residing in Assam. Those who entered Assam before or on this date would be considered Indian citizens, while those who entered after this date would be considered illegal immigrants.

Deportation: The Accord called for the deportation of all illegal immigrants identified after the cut-off date.

Voter list revision: It mandated the revision of the electoral rolls to remove the names of illegal immigrants.

Language protection: The Accord also addressed the issue of language protection, ensuring the use of Assamese as the official language of the state.

Constitutional safeguards: It provided for constitutional safeguards to protect the interests of the indigenous people of Assam.

About clause 6 of Assam accord :

- **Clause 6 of the Assam Accord (1985)** is a key provision designed to safeguard the identity, culture, and rights of the indigenous Assamese people.
- The Assam Accord was signed on August 15, 1985, between the Government of India and the leaders of the Assam Movement, which aimed to address the concerns of illegal immigration from Bangladesh into Assam.

Main Provisions of Clause 6:

Clause 6 of the Assam Accord specifically states:

- Constitutional, legislative, and administrative safeguards, as may be appropriate, shall be provided to protect, preserve and promote the cultural, social, linguistic identity and heritage of the Assamese people.

Key Objectives:

Protecting Assamese Identity: The main goal is to ensure that the cultural, linguistic, and social rights of the indigenous people of Assam are protected.

Legislative and Administrative Safeguards: The clause envisions that the Government of India will take legislative or administrative measures to protect the rights of Assamese people. However, specific provisions on what these safeguards would entail were not detailed in the Accord itself, leaving it open for future action.

Mineral Security Finance Network

Why in News? India recently joined US-led Mineral Security Finance Network.

India has officially joined the US-led minerals security finance network, which is designed to enhance cooperation and facilitate information sharing and co-financing among institutions in the Indo-Pacific region and Europe.

Objectives:

- To promote diverse, secure, and sustainable supply chains for critical minerals,..
- to diversify the supply chains which are concentrated in just one or two countries
- China's increasing influence over global critical mineral supplies.

This initiative is part of the Minerals Security Partnership.

About the Minerals Security Partnership:

- The Minerals Security Partnership (MSP) is an international initiative aimed at strengthening the supply chains of critical minerals essential for clean energy technologies, high-tech manufacturing, and national security.
- It was **launched in 2022 by the United States**, alongside a coalition of like-minded countries (EU) and regions, in response to growing concerns over the supply chain

vulnerabilities of key minerals such as **lithium, cobalt, nickel, and rare earth elements (REEs)**.

Objectives of the MSP:

Secure Access to Critical Minerals: The partnership focuses on securing a stable and reliable supply of critical minerals that are essential for the production of electric vehicles, renewable energy infrastructure, semiconductors, and other strategic industries.

Diversify Supply Chains: One of the key goals is to reduce dependency on a few countries (especially China) that currently dominate the production and processing of many critical minerals. The MSP seeks to create diversified, transparent, and sustainable global supply chains.

Sustainability and Environmental Standards: The partnership emphasizes sustainable mining practices and the importance of ensuring that environmental, social, and governance (ESG) standards are met in the extraction, processing, and distribution of critical minerals.

Boosting Investments: MSP aims to catalyze investment in mining and mineral processing projects in different regions, especially in developing countries rich in mineral resources. By pooling financial resources and expertise, the partners seek to ensure the development of new mineral extraction and processing facilities.

Key Minerals of Interest:

Lithium: Used in batteries for electric vehicles and renewable energy storage.

Cobalt: Critical for battery production.

Nickel: Essential for stainless steel and battery production.

Rare Earth Elements (REEs): Important for electronics, magnets, and military technologies.

Graphite, Manganese, and Copper: Key components for battery technologies and electrical infrastructure.

Participating Countries:

As of 2023, the MSP includes the following countries:

- United States
- Canada
- Australia
- Japan
- South Korea
- United Kingdom
- European Union (represented collectively)
- Germany

- Finland
- Sweden

Heat Dome Effect:

Why in news? The state of Assam has recently experienced unprecedented temperatures nearing **40°C in September**, unusual for the region, which may be attributed to the **Heat Dome Effect**.

About the Heat Dome Effect:

- It is a meteorological phenomenon where a high-pressure system traps a mass of hot air over a particular region for an extended period.
- This causes extremely high temperatures, often resulting in prolonged heatwaves.
- The trapped heat cannot escape, and as the high-pressure system persists, the area beneath it experiences rising temperatures, creating a "dome" of heat.

Key Features of the Heat Dome Effect:

High-Pressure System:

- A heat dome is formed when a high-pressure system in the upper atmosphere (typically in the troposphere) becomes stationary over a region.
- This high-pressure "dome" compresses air downwards, which heats the air as it descends due to compression (known as adiabatic warming).

Stagnant Weather Conditions:

- The high-pressure system blocks cooler air from entering the region and prevents clouds from forming, leading to clear skies and continuous sunlight, which further intensifies the heat.

The hot air remains trapped near the surface because there is little atmospheric circulation to displace it.

Worsening of Heat over Time:

- As heat builds up day after day under the dome, ground temperatures rise, sometimes reaching dangerous levels, especially during the peak summer months.

Prolonged Duration:

- Heat domes can persist for several days or even weeks, making it challenging for affected regions to cool down, especially at night, since the heat is trapped beneath the pressure dome.

Causes of the Heat Dome Effect:

Jet Stream Patterns:

- The heat dome is often related to patterns in the jet stream, which are fast-flowing air currents in the upper levels of the atmosphere.

- When the jet stream weakens or becomes wavy, it can create a ridge of high pressure, allowing the heat dome to form.

Ocean-Atmosphere Interactions:

- There is evidence that changes in ocean surface temperatures (e.g., La Niña conditions) may influence the formation of heat domes by affecting atmospheric circulation patterns.
- Warmer ocean temperatures can cause more heat and moisture to rise into the atmosphere, contributing to high-pressure ridges.

Impacts of the Heat Dome Effect:

Health Risks:

- Extreme temperatures can lead to heat-related illnesses, such as heat stroke, dehydration, and heat exhaustion. Vulnerable populations, such as the elderly, children, and those with pre-existing conditions, are at higher risk.

Agricultural Damage:

- Prolonged heat can stress crops, leading to reduced yields or complete crop failures. In extreme cases, it can also lead to wildfires due to dry conditions.

Increased Energy Demand:

- During a heat dome, energy demand spikes due to increased use of air conditioning, often leading to power outages or grid overload.

Environmental and Ecological Impact:

- Heat domes can exacerbate drought conditions, dry up water sources, and affect ecosystems, endangering wildlife and plant species.

Recent Examples:

- In June 2021, a significant heat dome occurred over the **Pacific Northwest of the United States and western Canada**, leading to record-breaking temperatures. Some regions experienced temperatures as high as **49.6°C (121.3°F)**, causing widespread wildfires and hundreds of heat-related deaths.

Garpiya-3 (G3):

Why in News ? Russia and China are engaged in a secret weapons programme to produce long-range drones against Ukraine, a report claims.

A subsidiary of Russian state-owned weapons company Almaz-Antey, IEMZ Kupol, have allegedly developed a new drone model called Garpiya-3 (G3) in China.

- The G3 UAV can travel about **1,243 miles (2,000 km) with a payload of 50kg**,

L-69 and C-10 groupings of nations:

Why in News ? Ministers from the L.69, a group of over 30 countries from across Asia, Latin America, and Africa, and C10, an influential group of African nations, were of the view that delaying Security Council reform “directly impacts the credibility and legitimacy” of the UN, according to a press release from India’s Ministry of External Affairs (MEA).

About L-69 Grouping:

Composition: The L-69 group consists of 42 developing countries from Africa, Asia, the Caribbean, and the Pacific. Key members include India, Brazil, South Africa, and several Caribbean nations.

Formation: It was established in 2013 as a coalition to represent the collective interests of developing nations, particularly in discussions on reforming global governance, including the United Nations Security Council (UNSC).

Objectives:

- Advocate for equitable representation of developing countries in global decision-making bodies.
- Promote issues such as climate change, sustainable development, and global trade that are crucial for the development of member nations.

About C-10 Grouping:

Composition: The C-10 group is a coalition of 10 countries from the Caribbean and the African continent. Notable members include Algeria, Angola, and Nigeria.

Formation: It was established to push for reforms in the United Nations Security Council and to advocate for the inclusion of African representation in a reformed UNSC.

Objectives:

- Strengthen the voice of African countries in global governance.
- Address issues related to peace and security in Africa and the broader global context.
- Push for a more democratic and representative UN system.

Fund Facility Arrangement (EFF)

Why in News ? IMF has recently officially approved \$ 7 billion Extended Fund Facility Arrangement (EFF) to Pakistan .

What is Extended Fund Facility?

- The Extended Fund Facility (EFF) is intended for countries facing longer-term structural economic problems, requiring more sustained reforms over a longer period to address deep-rooted balance of payments issues.

Key Features:

Duration: An EFF program typically lasts three to four years (up to 10 years for repayments), reflecting the time required to implement structural economic reforms.

Purpose: To provide financial support to countries that need to make significant policy adjustments, often involving complex structural reforms to correct economic imbalances.

Conditionality: Similar to the SBA, but the reforms under the EFF tend to focus more on long-term structural issues, such as labor market reforms, financial sector restructuring, and governance improvements.

Access to Funds: The EFF provides larger and longer-term financing compared to the SBA, with the disbursements spread over the program duration based on the country's adherence to agreed-upon reforms.

Example of Use:

- Countries like Egypt and Pakistan have turned to the EFF to address persistent economic issues, such as fiscal deficits, inflation, and structural economic weaknesses.

What is Stand-By Arrangement (SBA)?

- The Stand-By Arrangement (SBA) is the IMF's primary lending tool for short- to medium-term financial support. It is designed to help countries that are facing temporary balance of payments problems or short-term crises.

Key Features:

Duration: Typically, an SBA lasts for 12 to 24 months, though it can be extended up to 36 months in some cases.

Purpose: To provide short-term financial assistance to countries to address imbalances and prevent larger economic crises.

Conditionality: Countries receiving an SBA must implement policy reforms to restore economic stability, which can include fiscal austerity, monetary tightening, and structural reforms.

Access to Funds: The amount of financial assistance depends on the country's needs and the severity of its economic situation. The funds are disbursed in phases based on the completion of specific policy benchmarks.

Example of Use:

- Countries that experience sudden currency devaluation or external shocks (e.g., commodity price drops) may seek SBA support. **Argentina and Greece** have used SBAs in the past during economic crises.

Key Differences:

Time Horizon: SBA is for short- to medium-term challenges, while EFF targets long-term structural reforms.

Loan Repayment: SBA loans typically have shorter repayment periods (3 to 5 years), while EFF loans have longer repayment terms (4.5 to 10 years).

Focus: SBA focuses on immediate stabilization, while EFF is more concerned with deep, systemic changes in the economy.

What is Keffiyeh?

Why in news? Pulitzer Prize-winning author Jhumpa Lahiri has recently declined to accept an award from New York City's Noguchi Museum after it fired three employees for wearing keffiyeh head scarves, an emblem of Palestinian solidarity.

About keffiyeh:

- The keffiyeh (also known as kufiya, ghutra, or shemagh) is a traditional Middle Eastern headdress with deep cultural, historical, and political significance. It is commonly worn by men, particularly in Arab countries, but has also gained global recognition as a symbol of identity and resistance.

Key Features of the Keffiyeh:

Material: Traditionally, the keffiyeh is made of cotton or a cotton-wool blend, designed to be lightweight and breathable, making it suitable for the hot, arid desert climates.

Design: The most recognizable feature of the keffiyeh is its checkered pattern, typically in black and white, although variations in colors (such as red or green) exist depending on the region or country.

Wearing Style: It is usually folded into a triangle and draped over the head, with the two ends wrapped around the head or neck. It can also be secured with an agal (a black cord) to keep it in place.

Origins and Cultural Importance:

Historical Roots: The keffiyeh has been worn for centuries by people in the Arabian Peninsula and Mesopotamia. It was traditionally used by farmers and desert dwellers for practical purposes, such as protection from the sun, sand, and wind.

Regional Variations:

Palestine: The black-and-white keffiyeh is particularly associated with Palestinian identity. It became an iconic symbol of Palestinian nationalism and resistance, especially after being popularized by leaders like Yasser Arafat.

Jordan: The red-and-white keffiyeh, called the shemagh in Jordan, is often associated with Bedouin culture and is worn by the Jordanian royal family and the general population.

Iraq and the Gulf: In these regions, the keffiyeh is often referred to as the ghutra and is worn in white or with a more subtle pattern.

Intercepted Missile System/ Iron dome

Why in News ? The Israeli has recently intercepted a large number of the incoming missiles -- 180 from Iran by Iron Dome air defence system.

About Interceptive missile systems:

They are designed to detect, track, and destroy incoming ballistic missiles or airborne threats before they reach their targets. These systems are crucial components of missile defense strategies used by countries to protect against missile attacks. Interception can occur in different phases of the missile's flight—boost phase, midcourse phase, and terminal phase.

The main types of **interceptive missile systems**:

1. Boost-Phase Interception:

- These systems attempt to destroy an enemy missile during the early stage of its flight (within the first few minutes after launch). This is the most challenging phase for interception due to the short time window.

Example:

Airborne Laser (ABL) Program - Developed by the United States. It involved a laser system mounted on a Boeing 747 to destroy missiles in the boost phase. However, this program was eventually canceled.

Directed Energy Weapons - Countries like the U.S. and China are working on directed energy weapons (DEWs) like lasers for future boost-phase missile interception.

2. Midcourse-Phase Interception:

- These systems target the missile in the midcourse phase, where it travels through space (after the boost phase but before re-entry into the atmosphere).

Examples:

Ground-based Midcourse Defense (GMD) – United States. It uses Ground-Based Interceptors (GBIs) based in Alaska and California to intercept intercontinental ballistic missiles (ICBMs).

Aegis Ballistic Missile Defense (BMD) – United States and Japan. This sea-based system uses the SM-3 (Standard Missile-3) to intercept missiles in space during the midcourse phase.

S-500 Prometey – Russia. An advanced missile defense system designed to target ballistic missiles, cruise missiles, and even satellites during their midcourse flight.

3. Terminal-Phase Interception:

- In this phase, interceptors destroy the missile as it re-enters the atmosphere and approaches its target. Terminal-phase systems are often land-based and deal with shorter-range threats like medium and short-range ballistic missiles.

Examples:

- **THAAD** (Terminal High Altitude Area Defense) – United States. THAAD intercepts ballistic missiles during their terminal phase at high altitudes. It is deployed in countries like South Korea and the United Arab Emirates.

S-400 Triumph – Russia. A versatile air defense system capable of intercepting incoming missiles in their terminal phase. India has also purchased the S-400.

David's Sling – Israel. This system, part of Israel's multi-layered missile defense, intercepts medium-range threats in the terminal phase.

4. Layered Missile Defense:

- Some countries have developed multi-layered defense systems to intercept missiles at different phases of their flight, combining different types of interceptors for more comprehensive protection.

Examples:

Iron Dome – Israel. The Iron Dome is designed to intercept and destroy short-range rockets and artillery shells in the terminal phase. It forms part of Israel's multi-layer defense system.

Arrow Missile System – Israel. Arrow-2 and Arrow-3 are part of Israel's multi-layered system designed to intercept medium to long-range ballistic missiles at high altitudes and in space (midcourse phase).

Aegis Ashore – Japan, Romania (with U.S. cooperation). A land-based version of the Aegis BMD system, capable of intercepting medium-range ballistic missiles.

5. Air-Based Interceptors:

- These systems involve air-launched missiles that intercept airborne threats, such as enemy aircraft and cruise missiles.

Examples:

Patriot Missile System (PAC-3) – United States. An advanced air-defense system designed to intercept tactical ballistic missiles and cruise missiles. It is widely deployed in countries like Saudi Arabia, Israel, and Germany.

Barak-8 – India and Israel. A surface-to-air missile system designed to intercept airborne threats, such as aircraft and cruise missiles.

Key Countries with Advanced Interceptive Missile Systems:

United States:

- THAAD, GMD, Aegis BMD, Patriot (PAC-3).

Russia:

- S-400, S-500, A-135 missile defense system.

Israel:

- Iron Dome, David's Sling, Arrow Missile System.

China:

- HQ-9 (similar to the S-300) and developing advanced missile defense systems like HQ-19 (for midcourse interception).

India:

- Ballistic Missile Defence (BMD) Program, S-400, Barak-8, and collaboration on interceptive missile technology with Israel and the U.S.

Japan:

Aegis BMD, PAC-3, Aegis Ashore (in cooperation with the U.S.).

PM E-DRIVE Scheme

Why in News-The government has launched the PM E-DRIVE Scheme, with an outlay of Rs 10,900 crore for faster adoption of electric vehicles, setting up of charging infrastructure and development of EV manufacturing ecosystem in India.

The scheme shall be implemented from October 1, 2024 to March 31, 2026.

key points:

subsidy:

- The subsidy under the PM E-DRIVE scheme for electric two-wheelers has been fixed based on battery power at Rs 5,000 per kilowatt hour but the overall incentive will not exceed Rs 10,000 in the first year.
- Under the PM E-DRIVE scheme, subsidies/demand incentives worth Rs 3,679 crore have been provided to incentivise e-2Wheelers, e-3Wheelers, e-ambulances, e-trucks and other emerging EVs. The scheme will support 24.79 lakh e-2Ws, 3.16 lakh e-3Ws, and 14,028 e-buses.

Three-wheelers, including e-rickshaws, will get a demand incentive of Rs 25,000 in the first year, which will be halved to Rs 12,500 in the second year.

e-voucher:

- Ministry of Heavy Industries is introducing e-vouchers for EV buyers to avail demand incentives under the scheme. At the time of purchase of the EV, the scheme portal will generate an Aadhaar authenticated e-voucher for the buyer.
- The scheme addresses range anxiety of EV buyers by promoting in a big way the installation of electric vehicle public charging stations (EVPCS). These EVPCS shall be installed in select cities with high EV penetration and also on selected highways.
- The scheme proposes installation of 22,100 fast chargers for e-4Ws, 1,800 fast chargers for e-buses and 48,400 fast chargers for e-2W/3Ws. The outlay for EVPCS will be Rs 2,000 crore.

Rapid Financing Instrument (RFI):

Why in News? The Rapid Financing Instrument (RFI) is a financial tool provided by the International Monetary Fund (IMF) that offers quick financial assistance to member countries facing urgent balance of payments needs. It is designed to provide swift financial relief in cases of economic crises caused by external shocks, such as natural disasters, commodity price shocks, or health pandemics, without requiring a full-fledged economic reform program.

Key Features of the Rapid Financing Instrument (RFI):

Rapid Disbursement:

- The RFI allows for quick disbursement of funds to meet a country's urgent needs without requiring a drawn-out negotiation process.
- It is particularly useful for countries needing immediate financial support to stabilize their economy.

No Need for a Full Economic Program:

- Unlike other IMF financial tools that require countries to implement comprehensive economic reform programs, the RFI does not demand a full-fledged reform agenda. This makes it ideal for situations where immediate assistance is critical.

Flexible Conditions:

- While some policies and actions may still be encouraged, the RFI has fewer conditions attached compared to other IMF lending instruments, allowing recipient countries to focus on immediate stabilization efforts.

Access Limits:

- A country can access up to 50% of its IMF quota within a 12-month period under the RFI. The exact amount is determined based on the country's specific financing needs and the size of its IMF quota.

Eligibility:

- The RFI is available to all IMF member countries, irrespective of income level, and is used when a country faces balance of payments difficulties caused by sudden shocks or emergencies.
- **Repayment Terms:**
- The financial assistance provided under the RFI comes with standard IMF interest rates, and countries are expected to repay the funds within 3.25 to 5 years.

Use of the RFI:

- The COVID-19 pandemic saw widespread use of the RFI by several countries to manage the immediate economic impact of the global health crisis. Countries such as **Bangladesh, Nigeria, and Ukraine** received RFI support to address short-term balance of payments needs.

The RFI has also been used in situations of natural disasters, such as hurricanes and earthquakes, to stabilize economies quickly.

Comparison with Other IMF Instruments:

- Unlike instruments like the Stand-By Arrangement (SBA) or Extended Fund Facility (EFF), which are designed for longer-term balance of payments issues and require extensive negotiations, the RFI is simpler and faster.
- It is more suitable for short-term, emergency relief, whereas SBA and EFF are intended for more prolonged economic stabilization and reforms.

World Green Economy Forum 2024:

Why in News? The World Green Economy Forum was launched recently in Dubai, bringing together global leaders and experts to address pressing environmental challenges.

The forum's theme, "Empowering Global Action: Unlocking Opportunities and Advancing Progress,".

Key points of the session:

- A key session titled "Decarbonising Energy-Intensive and Hard-to-Abate Industries" explored strategies to reduce carbon emissions in heavy transport, construction, energy, and chemicals sectors.
- 4Ps: Adding Another 'P' to PPP (**Public-Private Partnerships + Philanthropists**)," highlighted the importance of collaboration between philanthropists and the public and private sectors to drive effective climate solutions.
- The potential applications of artificial intelligence in fostering a sustainable future were discussed in the session.
- How Can We Use AI to Help Create a Sustainable Future?"

The future of Sustainable Aviation Fuel (SAF):

- Panelists discussed the ambitious goal of scaling up SAF production from the current 200,000 tonnes to **300 million tonnes by 2050**. They also explored various CO2 sources for SAF production and emphasized the importance of stakeholder collaboration and capital investment.
- The UAE government's target of **1% SAF use by 2031** was noted as a key driver for change in the region.
- The forum also emphasized the critical role of youth in shaping a sustainable future, recognizing their importance in driving long-term environmental progress.

(PM-RKVY) /Krishonnati Yojana (KY):

Why in News? Union Cabinet approves Pradhan Mantri Rashtriya Krishi Vikas Yojana (PM-RKVY) to promote sustainable agriculture and Krishonnati Yojana (KY) to achieve food security for self-reliance

- States given the flexibility to reallocate funds from one component to another based on their specific requirement

About the Pradhan Mantri Rashtriya Krishi Vikas Yojana (PM-RKVY):

- PM-RKVY will promote sustainable agriculture, KY will achieve the goal of food security and self-reliance in agriculture. All the components will leverage technology to ensure efficient and effective implementation of various components.

- The Pradhan Mantri Rashtriya Krishi Vikas Yojana (PM-RKVY) and Krishonnati Yojana (KY) will be implemented with a total proposed outlay of Rs 1,01,321.61 crore. These schemes are implemented through the state governments.
- This exercise ensures continuation of all the existing schemes. Wherever any sector is considered necessary to be promoted for the welfare of farmers, the scheme has been taken up in mission mode. For example, **National Edible Oil Mission** – Oil Palm [NMEO-OP], Clean Plant Programme, Digital Agriculture and National Edible Oil Mission-Oilseed Seeds [NMEO-OS].
- Mission Organic Value Chain Development for North Eastern Region (MOVCDNER) Scheme, a component under KY, is being revised by adding an additional component namely MOVCDNER- Detailed Project Report (MOVCDNER-DPR) which will provide strength to the North Eastern States to address critical challenges.
- Rationalization of these schemes provides an opportunity to the States to prepare a comprehensive strategic document related to the **agriculture sector of the State** in a holistic manner. This strategic document not only focuses on production and productivity of crops but also addresses emerging issues related to development of climate resilient agriculture and value chain approach for agricultural commodities.
- These schemes are envisaged to articulate the overall strategy and schemes/programmes related to the objectives of the strategic framework.
- Out of the total proposed expenditure of Rs. 1,01,321.61 crore, the estimated expenditure of the Central share of the Department of Agriculture and Farmers Welfare (DA&FW) is Rs. 69,088.98 crore and the State share is Rs. 32,232.63 crore. This includes Rs 57,074.72 crore for RKVY and Rs 44,246.89 crore for KY.

PM-RKVY includes the following schemes:

- Soil Health Management
- Rainfed Area Development
- Agroforestry
- Paramparagat Krishi Vikas Yojana
- Agricultural Mechanization including Crop Residue Management
- Per Drop More Crop
- Crop Diversification Programme
- RKVY DPR Component
- Accelerator Fund for Agricultural Startups

The Gran Grif Gang:

Why in News? The Gran Grif gang is an armed criminal group in Haiti responsible for widespread violence, particularly in the Artibonite region. Recently, the gang executed a brutal attack in the Pont-Sondé locality, killing over 70 people and displacing thousands. The gang has taken control of large parts of the region, targeting civilians, burning homes and vehicles, and severely disrupting the community's daily life.

- The Haitian government and the National Police have struggled to contain the gang's activities, which have led to significant internal displacement and heightened insecurity. The leader of **Gran Grif, Luckson Elan**, has been sanctioned by the U.S. government for his involvement in human rights abuses and gang-related violence.

Global Framework on Chemicals Fund:

Why in News? The Global Framework on Chemicals fund has recently launched its first project, targeting the safe and sustainable management of chemicals and waste.

About the Global Framework on Chemicals:

- The Global Framework on Chemicals Global Framework on Chemicals - For a Planet Free of Harm from Chemicals and Waste (GFC), provides the essential building blocks for a future in which humanity benefits from chemicals in a safe and sustainable manner, while avoiding their negative impacts.
- The Framework, adopted in **September 2023 at the fifth International Conference on Chemicals Management (ICCM5)**, seeks to protect both the planet and human health, advocating for strong governance mechanisms and enforcing international standards.
- The Framework presents a comprehensive plan with five strategic objectives and 28 targets to guide countries and stakeholders in jointly addressing the lifecycle of chemicals, including products and waste.
- This unique **multi-stakeholder agreement** brings in a variety of sectors including representatives from governments, the private sector, non-governmental and intergovernmental organizations, youth and academia.

The Executive Board takes the operational decisions and oversees the functioning of the Fund. It is composed of:

- 2 National representatives of each United Nations region
- Representatives of all donors and contributors.

Financing: The Fund provides financial support of 300,000 to 800,000 USD for an implementation period of up to three years.

- Funding for the GFC Fund is provided through voluntary contributions.
- It is supported by the **Bonn Declaration**, a high-level declaration **also agreed at ICCM5 in Bonn, Germany**

Aditi 2.0 and DISC 12 Initiatives:

Why in News?- India's Defence Minister has recently launched two key initiatives—ADITI 2.0 and DISC 12—at **DefConnect 4.0 in Delhi**. These initiatives aim to strengthen India's defence technology ecosystem by encouraging innovation and providing financial support for new ideas.

What is ADITI 2.0?

- ADITI 2.0 focuses on 19 technology challenges that cover advanced areas like Artificial Intelligence, Quantum Technology, military communication systems, and anti-drone technology. The government is offering grants of up to ₹25 crore for those who come up with successful solutions to these challenges.

What is DISC 12?

- DISC 12, the 12th Defence India Start-up Challenge, introduces 41 new technology challenges. These challenges include innovations in **Unmanned Aerial Vehicles (UAVs)** and medical technologies. The programme also includes the Medical Innovations and Research Advancement (MIRA) initiative, which focuses on developing medical technologies specifically for the Armed Forces. The top ideas can receive grants of up to ₹1.50 crore.

iDEX Initiative:

- The Innovations for Defence Excellence (iDEX) initiative, which works with the Atal Innovation Mission, supports start-ups and small businesses (MSMEs) in developing new defence technologies. iDEX helps companies create prototypes and eventually bring these products to market.
- Since it started, iDEX has reviewed over 9,000 applications and partnered with more than 450 companies to boost defence innovation.

WWF's Living Planet Report (LPR) 2024

Why in News ? :There has been a steep 73% decline in the average size of monitored wildlife populations*in just 50 years (1970-2020), according to WWF's Living Planet Report (LPR) 2024.

- The Living Planet Index (LPI), provided by ZSL (Zoological Society of London), includes almost 35,000 population trends of 5,495 species from 1970-2020.

Key Findings of the report:

- The strongest decline is reported in **freshwater ecosystems 85%, followed by terrestrial 69% and marine 56%.**
- Habitat loss and degradation, driven primarily by our food systems, **is the most reported threat to wildlife populations around the world, followed by overexploitation, invasive species and disease.**
- Pollution is an additional threat for wildlife populations in Asia and the Pacific, which have recorded a staggering **60% average decline.**
- Declines in wildlife populations can act as an early warning indicator of increasing extinction risk and the potential loss of healthy ecosystems.
- When ecosystems are damaged, they can become more vulnerable to tipping points - being pushed beyond a critical threshold resulting in substantial and potentially irreversible change.
- Potential global tipping points, such as the **dieback of the Amazon rainforest** and the mass **die-off of coral reefs**, could create shockwaves far beyond the immediate area impacting food security and livelihoods.
- The decline of the three vulture species in India—white-rumped vulture (*Gyps bengalensis*), Indian vulture (*Gyps indicus*), and slender-billed vulture (*Gyps tenuirostris*)—is alarming.
- Research shows that these species have seen dramatic population decreases, particularly between 1992 and 2002.
- A 2022 nationwide vulture survey by BNHS highlights the extent of this decline: the white-rumped vulture population has dropped **by 67%, the Indian vulture by 48%,** and the slender-billed vulture by a staggering 89% compared to their populations in 2002.

- Despite a decline in many wildlife populations in India, some populations have stabilized and shown recovery, largely due to **proactive government initiatives, effective habitat management, and robust scientific monitoring**, combined with community engagement and public support.
- Notably, India is home to the largest population of **wild tigers globally**. The All-India Tiger Estimation 2022 estimated a mean of 3,682 tigers, a significant increase from the 2,967 estimated in 2018.
- Additionally, the Ministry of Environment, Forest & Climate Change (MoEF&CC) recently launched the first Snow Leopard Population Assessment in India (SPAI), which systematically evaluated **70% of their potential range**.
- This assessment estimated the snow leopard population at 718.
- It also provides insights into their distribution and the key threats they face, to further strengthen the conservation efforts for these magnificent creatures.

What report suggests?

- Countries have agreed on ambitious global goals to halt and reverse nature loss (the Global Biodiversity Framework), cap global temperature rise to 1.5°C (the Paris Agreement), and eradicate poverty (the UN Sustainable Development Goals).
- But the Living Planet Report says **national commitments and action on the ground fall far short of what's required to meet targets for 2030 and avoid dangerous tipping points**.
- The report states that the only way to make progress on the global goals of halting and reversing nature loss **by 2030 and addressing the drivers of climate change** is by transforming our energy, food and finance systems.
- At the same time, we must scale-up effective and **inclusive conservation action**, taking account of the rights, **needs and values of Indigenous Peoples** and local communities. **Ecosystem based adaptation (EbA)** - approaches which benefit biodiversity, climate and human well-being at the same time - hold enormous potential.

About WWF:

- WWF was founded on April 29, 1961, in **Morges, Switzerland**.
- It was initially called the **World Wildlife Fund**.
- WWF is an independent conservation organization, with over **30 million supporters** and a global network active in over 100 countries.
- WWF's mission is to stop the degradation of the Earth's natural environment and to build a future in which humans live in harmony with nature.

The Nobel Prize in Physics 2024:

Why in News? The Nobel Prize in Physics 2024 was awarded to John J. Hopfield and Geoffrey E. Hinton “for foundational discoveries and inventions that enable machine learning with artificial neural networks.”

John Hopfield created an associative memory that can store and reconstruct images and other types of patterns in data. Geoffrey Hinton invented a method that can autonomously find properties in data, and so perform tasks such as identifying specific elements in pictures.

What are Artificial Neural Networks (ANNs)?

Artificial Neural Networks (ANNs) are a type of computing system inspired by the biological neural networks that constitute animal brains. ANNs are designed to mimic how human brains process information, learn from data, and make decisions.

They are a foundational technology behind many modern machine learning and artificial intelligence (AI) systems.

Key Concepts of Artificial Neural Networks:

1. Structure of ANNs:

Neurons: The basic units of ANNs are artificial neurons (also known as nodes or perceptrons), which simulate the behavior of biological neurons. These neurons receive inputs, process them, and produce an output.

Layers: ANNs are organized into layers of neurons:

Input layer: This layer receives raw data as input (e.g., images, text, or numerical data).

Hidden layers: These layers perform transformations on the input data through weights, biases, and activation functions. The network's complexity and ability to learn complex patterns increase with more hidden layers.

Output layer: This layer produces the final output (e.g., a prediction, classification, or decision).

2024 Nobel Prize in Chemistry:

- On 9th October 2024, David Baker, Demis Hassabis, and John Jumper were awarded the 2024 Nobel Prize in Chemistry for breakthroughs in computational protein design and protein structure prediction.

Key Points:

- **David Baker's Computational Protein Design:** Baker was recognized for his pioneering work in computational methods that allow the design of new proteins, enabling the creation of designer proteins for specific applications.
- **AlphaFold and Protein Structure Prediction;** Hassabis and Jumper, creators of AlphaFold 2, revolutionized protein structure prediction by using AI to predict the structures of millions of proteins, solving a long-standing scientific challenge.
- **Advancements in AI for Chemistry:** The success of **AlphaFold 2** in predicting complex protein structures represents a major step forward in biochemistry, transforming research into drug design, disease understanding, and molecular biology.
- **Breakthroughs Recognized Soon After Discovery; Unlike many Nobel Prizes,** which often come decades after the original research, this prize comes within just 4-6 years of the **AlphaFold 2** development, reflecting its immediate global impact.
- **Non-Chemists Honoured for Contributions:** The award highlights the interdisciplinary nature of modern chemistry, with significant contributions from fields like artificial intelligence, extending chemistry's influence into areas like biochemistry.

What is AlphaFold?

It is an artificial intelligence (AI) system developed by DeepMind, a subsidiary of Alphabet (Google's parent company), to predict the 3D structure of proteins from their amino acid sequences. It represents a breakthrough in **computational biology** and **protein folding**, solving one of biology's most challenging problems. Understanding the 3D structure of proteins is essential for various biological processes, including drug discovery, disease understanding, and bioengineering.

Types of AlphaFold Models:**AlphaFold 1:**

Initial Model: The original version of AlphaFold competed in the 2018 CASP competition (CASP13) and performed remarkably well but was not the ultimate solution to the protein folding problem.

Focus: AlphaFold 1 was a combination of deep learning models and techniques based on **graph neural networks**, which allowed it to model protein folding pathways more efficiently than earlier methods.

AlphaFold 2:

Breakthrough Version: Released in 2020, AlphaFold 2 marked a significant leap in the field. This version used an improved neural network architecture and more sophisticated models, allowing it to predict protein structures with almost experimental-level accuracy.

Transformers and Attention Mechanisms: AlphaFold 2 utilizes **transformer networks**, a type of neural network architecture that has been highly successful in natural language processing (NLP) tasks. By using "attention" mechanisms, the model can focus on different parts of the amino acid sequence when predicting folding patterns.

CASP14 Performance: AlphaFold 2 performed at an unprecedented level in CASP14, with some predictions coming very close to the experimentally-determined structures.

National Agriculture Code

Why in News ? The Bureau of Indian Standards (BIS) has begun the process of formulating a National Agriculture Code (NAC), on the lines of the existing National Building Code and National Electrical Code.

What is the National Agriculture Code?

The BIS is the national body which sets standards for different products across various economic sectors. In agriculture, it has already set standards for machinery (tractors, harvesters, etc.) and various inputs (fertilisers, pesticides, etc.)

- However, there are still many areas not covered by the BIS standards. For example, there is no standard for agriculture practices like preparation of fields, micro irrigation and water use. Thus, for a long time, policymakers have felt a need for a comprehensive standards framework, like the one now being formulated by the BIS.
- The NAC will cover the entire agriculture cycle, and will also contain a guidance note for future standardisation.
- The code will have two parts. The first will contain general principles for all crops, and the second will deal with crop-specific standards for the likes of paddy, wheat, oilseeds, and pulses. The NAC will serve as a guide for farmers, agriculture universities, and officials involved in the field.

What will the NAC cover?

- In addition to standards for agriculture machinery, the NAC will cover all agriculture processes and post-harvest operations, such as crop selection, land preparation, sowing/transplanting, irrigation/drainage, soil health management, plant health management, harvesting/threshing, primary processing, post-harvest, sustainability, and record maintenance.
- It will also include standards for input management, like use of chemical fertilisers, pesticides, and weedicides, as well as standards for crop storage and traceability.
- Crucially, the NAC will cover all new and emerging areas like natural farming and organic farming, as well as the use of Internet-of-Things in the field of agriculture.

What are the stated objects of the National Agriculture Code?

- To create an implementable national code covering recommendations for agriculture practices taking agroclimatic zones, crop type, socio economic diversity of the country and all aspects of agrifood value chain into consideration;
- To act as an enabler of quality culture in Indian agriculture by providing the required reference to policy makers, agriculture departments and regulators for incorporating the provisions of NAC in their schemes, policies, or regulations;
- To create a comprehensive guide for the farming community to ensure effective decision making in agricultural practices;
- To integrate relevant Indian Standards with recommended agricultural practices.

To address the horizontal aspects of agriculture such as SMART farming, sustainability, traceability and documentation; and

To aid in the capacity building program organized by agriculture extension services and civil society organisations.

What is the proposed timeline for this project?

The BIS has already formulated a strategy to standardise practices. It has formed working panels for 12-14 specifically identified areas, which will include university professors and R&D organisations. These panels will draft the code, with a tentative deadline for the NAC set as October 2025.

What are Standardized Agriculture Demonstration Farms? How are they important?

- Apart from drafting the NAC, the BIS has also taken an initiative for setting up of 'Standardized Agriculture Demonstration Farm' (SADF) in selected agriculture institutes in the country.

- These farms will serve as experimental sites for testing and implementing various agricultural practices and new technologies in accordance with Indian Standards, according to the BIS.
- The BIS will provide financial assistance to these institutes for setting up the SADFs, where anyone including officials responsible for extension activities, farmers or industry people can come and learn.

Green Patches:

Why in News? The discovery of green patches in Antarctica is a recent phenomenon that has raised both scientific interest and environmental concerns. These patches are primarily areas of algae blooms growing in the Antarctic region, which have been observed more frequently in recent years.

What Are These Green Patches?

- The green patches observed in Antarctica are algal blooms—particularly microscopic plants, such as snow algae—that thrive in melting snow and ice.
- These algae can survive in extreme conditions and typically bloom during the summer months when temperatures rise, and snow starts to melt. The algae are green due to the chlorophyll they use for photosynthesis, and in some cases, red algae also appear, creating "red snow" or "watermelon snow."

Causes of Green Patches in Antarctica:

Warming Temperatures:

- Climate change has led to increasing temperatures in Antarctica, particularly along its coasts and the Antarctic Peninsula, which is one of the fastest-warming regions on the planet. As temperatures rise, snow and ice melt, creating moist environments suitable for algae to thrive.

Increased Snowmelt:

- More frequent and prolonged periods of snowmelt create the ideal conditions for algae to grow. The meltwater provides a habitat for algae, allowing them to spread across larger areas.

Nutrient Availability:

- Nutrients carried by wind and ocean currents, along with bird and animal droppings (like those of penguins and seals), contribute to the spread of algae by providing essential nutrients such as nitrogen and phosphorus.

Environmental Concerns:**Impact on Albedo Effect:**

- One of the most significant concerns is that algal blooms reduce the albedo (reflectivity) of the snow and ice surfaces.
- Snow and ice normally reflect most of the sunlight, helping to regulate the Earth's temperature. However, darker green patches absorb more heat, leading to further melting of ice and snow, which in turn accelerates warming and creates a feedback loop.

Ecological Imbalance:

- The rapid spread of algae could disrupt the Antarctic ecosystem, which is highly sensitive to changes. While some species may benefit from the increase in algae (such as certain microorganisms), it could negatively affect other species that rely on specific environmental conditions.

Indicator of Global Warming:

- The appearance of green patches is a visible sign of the ongoing impact of global warming in Antarctica. The region is already experiencing shifts in temperature, ice cover, and biodiversity, and the growth of algae is one of many indicators of how the polar environment is changing.

Potential for Expanded Habitats:

- As Antarctica warms, it may create conditions for more complex plant and microbial life to thrive, potentially transforming parts of the continent's landscape. This could lead to the emergence of new ecosystems in areas that were previously inhospitable due to extreme cold.

Global Sea Level Rise:

- The melting of Antarctic ice, exacerbated by the warming effect of algal blooms, contributes to global sea level rise. Even small increases in sea levels can have

catastrophic effects on coastal communities worldwide, increasing the frequency of flooding and storm surges.

10-point plan in India-ASEAN Summit

- Prime Minister Narendra Modi, while addressing the 21st India-ASEAN Summit, said that India's trade with ASEAN countries has doubled in the last decade and now stands at over \$130 billion. Modi said that he is confident that the 21st century, also known as the Asian century, is the century of India and ASEAN countries. ASEAN countries include Malaysia, Thailand, Brunei, Cambodia, Indonesia, Myanmar, Philippines, Vietnam, Laos and Singapore.
- Prime Minister Narendra Modi announced a 10-point plan to strengthen partnership with ASEAN countries.

Announcement of 10-point plan -

1. Celebrating 2025 as ASEAN-India Tourism Year. For this, India will provide US\$5 million for joint activities
 2. Celebrating a decade of Act-East Policy through a number of focused activities including Youth Summit, Start-up Festival, Hackathon, Music Festival, ASEAN-India Think Tank Network and Delhi Dialogue
 3. Organizing ASEAN-India Women Scientists Conference under the ASEAN-India Science and Technology Development Fund
 4. Doubling the number of scholarships at Nalanda University, providing new grants for ASEAN students in agricultural universities in India
 5. Review of ASEAN-India Trade in Goods Agreement by 2025
 6. India will provide US\$5 million for disaster resilience
 7. Launching a new track of Health Ministers towards health
 8. Launching a regular mechanism of ASEAN-India Cyber Policy Dialogue towards strengthening digital and cyber policy
 9. Workshop on Green Hydrogen
 10. Inviting ASEAN leaders to join the 'Plant a Tree for Mother' campaign towards climate resurgence
- PM Modi announced the establishment of the ASEAN India Fund for a Digital Future, which aims to enhance financial connectivity between ASEAN and India. He also expressed support for the ASEAN think tank ERIA which will deepen ASEAN-India relations.

Nasa launched Europa Clipper mission :

Why in News? National Aeronautics and Space Administration (Nasa) is set to launch its most ambitious planetary mission to Jupiter's icy moon Europa, aiming to explore the potential for life in the solar system's most intriguing ocean worlds. The launch of the Europa Clipper space tool place on 14 Oct , 2024.

- The spacecraft is scheduled to launch from Nasa's Kennedy Space Center in Florida aboard a Falcon Heavy rocket. It is the largest spacecraft Nasa has ever built for any planetary mission. Reportedly, with solar arrays extended, it spans a basketball court (100 feet, or 30.5 meters, tip to tip).
- The journey of the Europa spacecraft wouldn't be a straight one but a long one, i.e., 1.8 billion miles (2.9 billion kilometres) as the Europa clipper will loop around Mars and then Earth, gaining speed as it swings past.
- The mission has two potential launch windows from now till November 6. Nasa needs to be vigilant as both opportunities are instantaneous as there is only one exact timing per day when the launch may occur. Plans to launch Europa Clipper on October 5 were delayed due to the impacts of Hurricane Milton.

What will Europa Clipper do?

- The \$5 billion mission aims to investigate potential life beneath the icy crust of Jupiter's moon Europa.
- According to scientists, Europa contains a vast subsurface ocean that has more water than all the Earth's oceans combined which is a key target in the search for extraterrestrial life.

Europa Clipper to join Juno and JUICE:

- There have already been two spacecraft orbiting Jupiter: NASA's Juno orbiting Jupiter since July 2016 and ESA's JUPITER ICy moons Explorer (JUICE) launched in April 2023.
- The Europa Clipper will complete the triad of missions, and it is expected to arrive in Jupiter in April 2030, beating JUICE to its destination by about a year, all thanks to differing trajectories.

ASEAN Regional Forum (ARF):

The **ASEAN Regional Forum (ARF)** is an important platform for security dialogue in the Asia-Pacific region. It involves not only the ten ASEAN (Association of Southeast Asian Nations) member states but also several key non-ASEAN countries that are important stakeholders in regional security.

1. History and Formation:

- The ARF was established in **1994** during the 26th ASEAN Ministerial Meeting (AMM) in Bangkok, Thailand.
- It was created to address growing security concerns in the Asia-Pacific region, offering a multilateral setting for discussing and resolving political and security issues.

2. Membership:

- The ARF consists of **27 members**: the 10 ASEAN member states and 17 other participants, including countries like:
 - India
 - China
 - Japan
 - South Korea
 - Australia
 - Russia
 - The United States
 - The European Union
 - Canada, and others.
- **India** has been a member since **1996**.

The Expanded ASEAN Maritime Forum (EAMF):

- The **Expanded ASEAN Maritime Forum (EAMF)** is a platform that involves ASEAN member states and non-ASEAN countries to address maritime security challenges and promote maritime cooperation. The EAMF builds on the ASEAN Maritime Forum (AMF), which focuses on issues related to maritime safety, security, and cooperation within ASEAN, but extends it to a broader set of regional and global partners.

India's Membership:

- **Yes**, India is a member of the EAMF. India actively participates in the EAMF to strengthen maritime cooperation, especially in areas like maritime security, combating piracy, and enhancing freedom of navigation in the Indo-Pacific.

Objectives:

- The EAMF aims to:
 1. **Strengthen maritime security:** Promote maritime security cooperation among ASEAN member states and external partners, particularly in the areas of combating piracy, trafficking, and other maritime crimes.
 2. **Encourage collaboration:** Facilitate cooperation on non-traditional security issues, such as disaster relief, environmental conservation, and sustainable development in maritime zones.
 3. **Promote freedom of navigation:** Support the peaceful use of maritime zones, in line with international law, particularly the United Nations Convention on the Law of the Sea (UNCLOS).
 4. **Build trust and confidence:** Enhance trust among participating states through dialogues, capacity-building initiatives, and joint exercises, promoting a stable and secure maritime environment.

Meetings:

- The EAMF is held on an annual basis, alongside the ASEAN Maritime Forum (AMF). It brings together ASEAN countries and key external partners, such as the United States, India, China, Japan, South Korea, Australia, and Russia, among others.

ASEAN Plus Three (APT):

ASEAN Plus Three is a regional framework that involves the ten ASEAN (Association of Southeast Asian Nations) member states along with three East Asian countries: **China, Japan, and South Korea.**

Key Points:**Members:**

ASEAN Member States: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam.

Plus Three: China, Japan, South Korea.

Formation: The ASEAN Plus Three process was initiated in 1997 as an informal summit, growing out of the need for East Asian cooperation following the 1997 Asian Financial Crisis.

Objectives:

- To strengthen cooperation in various areas, including economic, political, and security matters.
- To promote economic integration and financial stability, especially in the wake of economic crises.
- To address regional issues like food security, energy, climate change, and transnational crime.
- To foster people-to-people exchanges and cultural cooperation.

Key Initiatives:

Chiang Mai Initiative: A multilateral currency swap arrangement aimed at stabilizing financial markets in times of crisis.

ASEAN+3 Emergency Rice Reserve: A program designed to ensure food security in case of natural disasters or food crises.

- **Significance:** ASEAN Plus Three serves as a crucial platform for deepening East Asian integration and cooperation. It has fostered a more cohesive regional economic and political environment and has become an important mechanism for addressing both regional and global issues.
- **India is not a member** of the ASEAN Plus Three framework but maintains strong bilateral and multilateral ties with ASEAN and its member states through other forums such as the East Asia Summit (EAS) and the ASEAN Regional Forum (ARF).

Greenwashing guidelines:

Why in New? Seeking to restrain companies from making false or misleading claims about the environment-friendly nature of their products or services, the Centre recently released new guidelines that make it mandatory for companies to substantiate their claims with scientific evidence.

The Guidelines for Prevention and Regulation of Greenwashing or Misleading Environment Claims were issued by the **Central Consumer Protection Authority (CCPA)** which works under the Consumer Affairs Ministry.

What is greenwashing?

- Although greenwashing as a term has been used in the limited context of advertising in these guidelines, it has a much broader scope. Greenwashing refers to the growing tendency of companies, organisations or even countries to make dubious or

unverifiable claims about their activities, products or services being environment-friendly or climate-friendly.

- Due to heightened sensitivity to climate change, there is rising pressure on corporations and governments to carry out their activities in a way that causes the least damage to the environment. Many of them also have legal commitments, or targets, to adhere to in this regard.
- As a result, companies and governments often make claims that are exaggerated, misleading, or, in some cases, wrong.
- The **2015 Volkswagen scandal**, in which the German car company was found to have been cheating in emissions testing of its supposedly green diesel vehicles, is one of the headline-grabbing examples of greenwashing. Several other big corporations, including Shell, BP, and Coca Cola have faced accusations of greenwashing.

What are the advertising guidelines for preventing greenwashing?

- The mandate of CCPA is to protect consumer interest and therefore, its guidelines are limited to curbing greenwashing in advertisements of products or services. They define greenwashing as “**any deceptive or misleading practice**” that conceals, omits or hides relevant information, or exaggerates, or makes vague or **unsubstantiated environmental claims about the product or service**.
- Use of misleading words, symbols or imagery, emphasizing positive environmental attributes while downplaying or concealing negative aspects would constitute greenwashing, according to the guidelines.
- However, they allow the use of “**obvious hyperboles**” or “**puffery**”, which is central to the advertising business, if these do not amount to deception or misleading practice.
- If a company, for example, makes the statement that its growth is based on “sustainable principles”, it would not be **treated as a misleading environmental claim** for the purposes of these guidelines. But if the company claims that all its products are manufactured sustainably, then it would be examined for greenwashing, the guidelines said.
- Thus, generic terms like “clean”, “green”, “eco-friendly”, “good for planet”, “cruelty-free”, “**carbon neutral**”, “natural”, “**organic**”, “**sustainable**”, or similar other descriptions for a product would be allowed only if the company is able to substantiate these with evidence. The company will also have to use “adequate and accurate” qualifiers and disclosures while advertising such descriptions.

About the Central Consumer Protection Authority (CCPA):

The Central Consumer Protection Authority (CCPA) was established under the Consumer Protection Act, 2019 to protect consumer rights, prevent unfair trade practices, and address consumer complaints.

Composition of CCPA:

Chairperson: The CCPA is headed by a Chief Commissioner (Chairperson), appointed by the Central Government.

Members:

- There are two additional Commissioners, one for goods and another for services, also appointed by the Central Government.
- The CCPA can include other officers and employees as necessary to carry out its functions.

Advisory Council: The CCPA may have an advisory council with experts from various fields like consumer rights, law, and public administration to provide suggestions on matters related to consumer protection.

Powers of CCPA:

- The CCPA can conduct **inquiries into violations** of consumer rights and investigate unfair trade practices or misleading advertisements.
- It can also refer matters for investigation to the Director-General (investigation) under the authority.
- The authority can issue **directions to recall unsafe goods or withdraw misleading** advertisements.
- It can order a company to **refund the price of the goods or services** if found defective or unsafe.
- The CCPA has the power to **impose penalties on individuals or businesses for misleading advertisements**.
- It can also hold the endorser or the publisher of such ads responsible.
- The CCPA can **act suo moto** (on its own motion) in cases where it suspects consumer rights violations or any unfair trade practices.
- The CCPA can initiate **class action suits** in cases involving multiple consumers being harmed by the same product or service.

Miombo forest

Why in News? The United Nations Food and Agriculture Organization (FAO) and the Italian Agency for Development Cooperation (AICS) have recently signed two agreements for the implementation of projects aimed at protecting the miombo forest and facilitating trade in the border region between Mozambique and Zimbabwe. The agreements were signed in **Maputo**.

These projects, valued at just over \$8 million, will be funded by Italy within the framework of the Mattei Plan for Africa. The initiatives are designed to promote sustainable development and cooperation between Mozambique and Zimbabwe by increasing food security, improving livelihoods, and promoting resilience against environmental and economic challenges.

- The first project, Integrated Transboundary Sustainable Management of Miombo Forests, aims to protect, restore, and promote the sustainable use of the **Miombo forest shared by Mozambique and Zimbabwe**.
- This forest is vital for millions of people in rural areas, providing essential resources such as firewood, food, and water.
- The project will focus on sustainable livelihoods, biodiversity conservation, and enhancing community-based management practices.
- It will directly benefit 5,000 families in selected areas, promoting gender equality and youth participation. This initiative aligns with the **Protocol and the Maputo Declaration (2022)** on sustainable and integrated management of Miombo woodlands, adopted in August 2022.

About Miombo:

- The Miombo is a biome that includes tropical and subtropical grasslands, bushlands, and savannahs.
- It also encompasses four bio-regions and is responsible for maintaining the **Greater Zambezi**, one of the most important transnational river basins.

About the Maputo Declaration (2022):

- It refers to the renewed commitment by African nations to strengthen efforts for agricultural development and food security in Africa.
- It builds upon previous declarations, particularly the **Maputo Declaration of 2003**, which focused on boosting agriculture and reducing hunger across the continent. Here's an overview of the 2022 declaration:

Matsigenka community:

- The recent murder of Gerardo Keimari Enrique, an Indigenous leader from **Peru's Matsigenka community**, has intensified calls for stronger protection of Indigenous land rights.
- The Matsigenka community is an Indigenous group primarily located in the **Peruvian Amazon**, particularly in the region of **Madre de Dios and parts of Cusco**.



FAO report 2024 :

Why in News? Poor households globally lose 5% of their total income in an average year from heat stress and 4.4% from floods compared with households that are relatively better off, the Food and Agriculture Organization of the United Nations said in a report recently, warning about the negative impacts of climate change on the farming population in India.

The title of report “**The unjust climate. Measuring the impacts of climate change on rural poor, women, and youth**” .

Key points of the report:

- The report said on-farm **income sources of the rural poor** in India were affected in different ways depending on the type of **climate stress**.
- In case of droughts or such events, poor households dedicated more time and resources to agricultural production to sustain themselves, as **off-farm employment opportunities reduced**.
- The total incomes of poor households reduce compared with those of families that have not been **exposed to a significant climate stressor**.
- “The vulnerability of poor households to climate stressors is likely to be rooted in structural inequalities,”

Measures need to be taken:

- The report said and asked the government to take policy measures such as **expanding the social security net**.
- **Anticipatory social protection programmes** can be scaled up and scaled out to more beneficiaries in anticipation of an extreme weather event, “Providing effective livelihood support ahead of extreme weather events can help reduce reliance on

adverse coping strategies and limit the number of people pushed into poverty because of these events.

- The report recommended improving **workforce diversification** and enhancing **off-farm employment opportunities**. It urged policymakers to address “gendered barriers” in non-farm employment.

How India is doing to deal with the issue of climate change?

- The implementation of **National Innovations on Climate Resilient Agriculture (NICRA)** much earlier to address the problem of climate change.
- India was first in the world to do so for all crops.
- India also have a contingency plan for all agriculture districts.
- India is the first country to implement an employment guarantee scheme as a social safety net.

About National Innovations on Climate Resilient Agriculture (NICRA):

Launched: 2011

Implementing Body: Indian Council of Agricultural Research (ICAR)

Objective:

- The NICRA project aims to enhance the resilience of Indian agriculture to climate variability and change.
- The primary goal is to develop and implement strategies for adapting agricultural practices to withstand the adverse effects of climate change while sustaining productivity.

Major Focus Areas:

1. **Crop Production:** Development of climate-resilient varieties of crops such as heat-tolerant wheat, drought-resistant rice, and pest-resistant crops. It also involves identifying optimal sowing times and cultivation practices to cope with changing climate patterns.
2. **Livestock and Fisheries:** The project includes improving livestock breeds that are more resilient to temperature changes and developing better water management systems for fisheries to cope with drought and floods.
3. **Soil and Water Management:** Soil health improvement through conservation practices, water harvesting techniques, and efficient irrigation systems are demonstrated and adopted to combat water scarcity and soil degradation caused by erratic rainfall.

Mitigation of Greenhouse Gas Emissions: NICRA encourages practices that reduce greenhouse gas emissions from agriculture, such as adopting zero-tillage, improved nutrient management, and alternate wetting and drying (AWD) in paddy fields

Graded Response Action Plan (GRAP-II)::

Why in New? The second stage of the Graded Response Action Plan (GRAP-II), implemented by the **Commission for Air Quality Management (CAQM)**, has come into effect from October 22. The decision was taken after reviewing the air quality scenario in the region, as per the CAQM order.

As of 4 pm on October 21, the national capital's **AQI stood at 310**, which comes under the '**very poor**' category according to the **Central Pollution Control Board (CPCB)**.

- In an effort to prevent further deterioration of the air quality, the Sub-Committee decided that all actions as envisaged under **Stage II of the GRAP-Very Poor Air Quality** be implemented by all the agencies concerned in the NCR, in addition to the **Stage-I actions** already in force, from **8:00 A.M. of 22.10.2024** in the National Capital Region (NCR).
- The India Meteorological Department (IMD) and IIT Madras (IITM) predicted that Delhi's air quality could remain in the '**very poor**' category between **301-400** in the coming days.
- IMD and IITM said this could be due to the **unfavourable meteorological and climatic conditions as well as calm winds**.

About the Graded Response Action Plan (GRAP) :

It was launched in **2017** by the **Environment Pollution (Prevention and Control) Authority (EPCA)** in collaboration with the **Central Pollution Control Board (CPCB)**.

GRAP is an emergency response mechanism aimed at tackling air pollution, particularly in the **National Capital Region (NCR)**, which includes Delhi and nearby areas.

Purpose:

GRAP is designed to take **immediate actions** based on different levels of air quality to mitigate pollution, especially during severe air pollution episodes like those witnessed in Delhi during the winter months.

Key Features of GRAP

Moderate to Poor (AQI 101-300):

- Heavy fines for polluting industries.
- Mechanized cleaning and sprinkling of water on roads.

Very Poor (AQI 301-400):

- Ban on diesel generators (except for essential services).
- Increased frequency of public transport.

Severe (AQI 401-500):

- Closure of brick kilns and hot mix plants.
- Ban on stone crushers and firecrackers.

Severe+ or Emergency (AQI >500):

- Closure of schools, offices, and construction activities.
- Odd-even vehicular scheme may be enforced.
- Ban on the entry of heavy vehicles into the city.

The International Transport Workers' Federation (ITF):

- The International Transport Workers' Federation (ITF) is an international federation of transport workers' trade unions. Around 700 unions representing 19.5 million transport workers from some 150 countries are ITF members.
- It is one of several global union federations allied with the International Trade Union Confederation (ITUC).
- The ITF's headquarters is in London and it has offices in Amman, Brussels, Nairobi, New Delhi, Ouagadougou, Rio de Janeiro, Singapore and Tokyo.

BRICS summit 2024 : Kazan Declaration:

Why in News? The BRICS summit 2024 was recently held at Kazan , Russia. It focused on Strengthening Multilateralism for Just Global Development and Security.

Key Declaration:

- Russia emphasized a BRICS-led payment system against SWIFT. The BRICS nations agreed to explore initiatives, such as BRICS Grain Exchange and BRICS (Re)Insurance Company.
- The summit also endorsed the creation of a BRICS Partner Country category, which would allow other nations to collaborate with BRICS on various projects.
- BRICS R&D Vaccine Center was announced for fostering research in vaccine development.

Biodiversity Intactness Index (BII)

Why in News? The Natural History Museum (NHM) has recently carried out a study that says that Biodiversity is declining more quickly inside key protected areas than outside them. The analysis was carried out by the, based in London.

The critical biodiversity areas (CBAs) ecosystems and areas such as wetlands that are crucial for biodiversity — **22% of which is protected**

What the report says?

- The findings, which raise questions about the ongoing conservation practices, suggest that merely designating more areas as protected **“will not automatically result in better outcomes for biodiversity”**.
- It is “a wake-up call” to policymakers and enforcers of the legislation that it was not enough just to designate an area as protected.
- The government and policymakers need to know it is not about just hitting a number
- The **Biodiversity Intactness Index (BII)** has decreased by **1.88 percentage points globally between 2000 and 2020**.
- They found that **“within those critical areas that were not protected, biodiversity had declined by an average of 1.9 percentage points between 2000 and 2020, and within the areas that were protected it had declined by 2.1 percentage points.**

Why is the decline happening?

- Many of the protected **areas are not designed to safeguard** the whole ecosystem but only certain species. This means that complete **“biodiversity intactness” is not a priority.**
- Another threat to the protected areas is oil, gas, and mining concessions — land granted by the government to companies which explore for and produce oil, natural gas, and other hydrocarbons. For instance, more than **65% of the Conkouati-Douli national park**, which is one of the most **biodiverse protected areas in the Republic of the Congo**, is occupied by oil and gas concessions.

- The climate crisis also has a role to play. more frequent and intense droughts and wildfires have severely impacted the protected areas. For example, several of Australia's national parks, which have been stringently protected by **authorities**, **were destroyed by wildfires in 2019**.

What is way forward ?

- The region-specific analysis is required to determine why these landscapes are deteriorating.
- Protections in place are not stringent enough.
- Countries need to continue their focus on **30x30** (a commitment made by countries at Biodiversity COP15 to put at least **30% of the world's lands** and oceans under conservation by 2030), that shouldn't waver.
- They just need to bring more into it, and pay more attention to actually conserving the land which provides those **ecosystem services**.

About the Biodiversity Intactness Index (BII) :

- It is released by the **Natural History Museum in London**. The BII is a metric used to assess the extent to which biodiversity in an area remains intact despite human activities.
- It measures the average abundance of originally present species relative to pre-impact levels, providing insights into ecosystem health and the effects of land use, deforestation, agriculture, and urbanization on biodiversity.
- The BII provides a percentage score, reflecting how much of an area's original biodiversity remains. For example, a BII of **90% suggests that 90%** of species populations remain intact, while a score below **50% may indicate significant biodiversity loss**.

About the Natural History Museum (NHM) :

- It is based in **London** . It is one of the **world's most famous museums**, dedicated to the study of natural history and biodiversity.
- NHM houses an extensive collection of specimens and provides resources for scientific research, public education, and conservation advocacy.
- The museum's collections and research support efforts to understand the Earth's natural **diversity and address pressing environmental challenges**, such as climate change and biodiversity loss.

Sarco Or Suicide pod'

Why in News? Switzerland police has recently arrested at least four persons for their involvement in the death of a 64-year-old American woman by a 'suicide pod'. The woman, whose identity has not been disclosed, reportedly suffered from an **autoimmune condition for years**.

- This incident has turned the spotlight on the contentious Sarco pod, engineered by Dr Philip Nitschke, an Australian physician who founded the **pro-euthanasia group Exit International**.
- More crucially, it also raises questions about the **ethics of assisted dying and euthanasia**.

What are euthanasia and assisted dying?

- Both euthanasia and assisted dying are ways in which a person may intentionally choose to end their life.
- Euthanasia relies on the presence of a **physician to address a lethal drug** to the person. Euthanasia may be of two kinds — voluntary, where the patient gives their explicit consent, and involuntary, when they are unable to do so, possibly because they are in a coma.
- **Assisted dying**, on the other hand, is understood to rely on self-administration of the lethal substance, with medical involvement restricted simply to the procurement of the drug. It means intentionally helping another person end their life, and does not stipulate that the person is terminally ill.

What is the Sarco pod?

- Named after sarcophagus, the stone coffin used to bury ancient royalty, the Sarco is a coffin-sized, air-tight machine designed by **Exit International**.
- First made in 2019, **the Sarco pod consists of a 3D-printed** detachable capsule placed on a stand with a canister of liquid nitrogen. A person lying inside it could press a button to initiate the dying process, flooding the air inside it with **nitrogen gas**.
- The device was designed and built in the **Netherlands by Nitschke and Dutch engineer Alex Bannink over 12 years and cost around €650,000 (\$725,000)** to research and develop. Future pods are estimated to cost around €15,000 and to be reusable.

Who can Access it ?

- The pod is not available to just anyone, and interested candidates must clear an online mental fitness test first. "If they pass, they receive an access code to a **Sarco device that works for 24 hours**. After the code is entered and an additional confirmation given,

liquid nitrogen in the generator is released, rapidly bringing down the oxygen level in the capsule. Within a minute, the user loses consciousness; death comes a short time later.

- The device is portable and can be transferred where one chooses.

The Currency Composition of Official Foreign Exchange Reserves (COFER) :

- It is a statistical database maintained by the International Monetary Fund (IMF) that tracks the currency composition of countries' foreign exchange reserves. These reserves are assets held by central banks and monetary authorities in different currencies, used to support the national currency and meet international payment obligations.

Key Aspects of COFER:

Composition of Reserves: COFER reports the reserves held in various major currencies, primarily:

- US Dollar (USD)
- Euro (EUR)
- Japanese Yen (JPY)
- British Pound (GBP)
- Chinese Renminbi (CNY)
- Swiss Franc (CHF)

Business Email compromise (BEC)

What is business email compromise (BEC)?

Business email compromise (BEC) is a type of social engineering attack that takes place over email. In a BEC attack, an attacker falsifies an email message to trick the victim into performing some action — most often, transferring money to an account or location the attacker controls. BEC attacks differ from other types of email-based attacks in a couple of

Key areas:

- They do not contain malware, malicious links, or email attachments
- They target specific individuals within organizations

- They are personalized to the intended victim and often involve advance research of the organization in question

BEC attacks are particularly dangerous because they do not contain malware, malicious links, dangerous email attachments, or other elements an email security filter might identify. Emails used in a BEC attack typically contain nothing but text, which helps attackers camouflage them within normal email traffic.

Mule Accounts and Rented Accounts :

- A mule account is used by criminals to move illicit funds from one place to another to conceal the origins and destination. Often, the account holder (or “mule”) may or may not be aware of the illegal nature of the transactions they’re helping to facilitate.
- Mule accounts are commonly part of schemes like money laundering, phishing, and business email compromise (BEC) fraud.
- Mules can be either unwitting participants (thinking they’re doing legitimate work) or complicit participants (knowing they’re assisting in a crime).

Rented Accounts:

- Rented accounts, on the other hand, involve individuals who knowingly “rent out” access to their bank accounts to someone else, often in exchange for a fee.
- In a rented account scheme, the account holder is usually aware that they’re giving someone else access, though they might not always know the specifics of the illegal activities involved.
- Rented accounts are similarly used in fraud and laundering but are often more intentional. They’re also riskier for the renter, as they actively participate in providing access.

Key Differences:

- Mule account holders can be unknowing participants, while rented account holders are generally aware that they’re renting out their account.
- Mule accounts are typically controlled by a third party after recruiting the account holder, while rented accounts are provided intentionally for temporary use by the account holder.

Example:

Mule Account: A person responds to a job ad offering easy income for transferring funds, unaware that the money originates from phishing scams.

Rented Account: An individual is approached with an offer to let someone use their account in exchange for a monthly fee. They allow access, knowing that the third party will be using it for unknown purposes.

Both types are frequently flagged by banks for potential money laundering and fraud, as they're used to disguise the movement of funds in criminal schemes.

Fast-Moving Consumer Goods (FMCG):

What are Fast-Moving Consumer Goods (FMCG)?

Fast-Moving Consumer Goods (FMCG) are products that are sold quickly at relatively low cost and have high turnover due to frequent consumer demand. These products are essential in daily life, so they tend to be used up quickly and purchased regularly, such as packaged foods, personal care items, and household supplies.

Key Characteristics of FMCG:

- **High Volume, Low Cost:** FMCG items are generally inexpensive, allowing consumers to buy them in large volumes. Examples include snacks, soap, toothpaste, and beverages.
- **Short Shelf Life:** Many FMCG products, like food and toiletries, are perishable or consumable, meaning they are used up quickly.
- **Frequent Purchases:** FMCGs are essential, everyday items that consumers buy repeatedly, ensuring consistent demand.
- **Categories of FMCG Products:**
 - **Food and Beverages:** Packaged foods, soft drinks, dairy products, snacks, and frozen foods.
 - **Personal Care Products:** Items like shampoos, deodorants, toothpaste, and cosmetics.
 - **Household Products:** Cleaning supplies, detergents, air fresheners, and paper goods.
 - **Over-the-Counter (OTC) Medications:** Non-prescription items like pain relievers, cough syrup, and vitamins.

Examples of Leading FMCG Companies:

Global Brands: Procter & Gamble, Unilever, Coca-Cola, Nestlé, and PepsiCo are top FMCG companies, offering a wide range of products worldwide.

Local Brands: Many regions also have popular local brands that specialize in specific FMCG categories.

Distribution Channels:

FMCG products are commonly available in supermarkets, convenience stores, and increasingly through online retail, making them easily accessible to consumers.

Trends in FMCG:

E-commerce Growth: More FMCG products are being sold online, as consumers look for convenient shopping options.

Sustainability Focus: FMCG companies are prioritizing sustainable packaging and sourcing practices to meet consumer demand for eco-friendly products.

Health Conscious Products: Growing interest in organic, plant-based, and low-calorie options is shaping the FMCG sector.

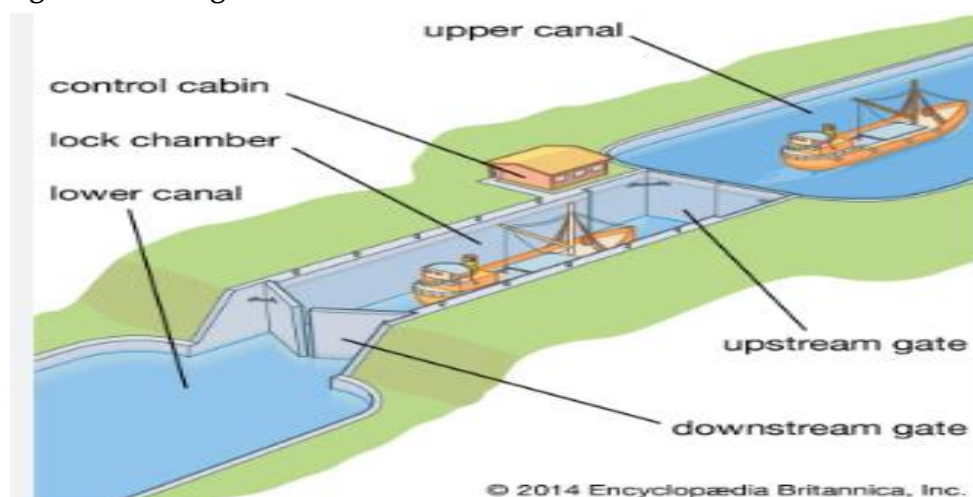
FMCG is an essential industry as it meets everyday consumer needs and provides jobs across production, logistics, and retail, significantly impacting the global economy.

Dutch Gravity Canal System

Why in News? The Andhra government is planning to introduce the Netherland's gravity canal system.

What is Dutch gravity canal system ?

The **Dutch gravity canal system** is an impressive network of water management canals, dikes, and locks in the Netherlands designed to control water levels and manage flooding. The Netherlands, being a low-lying country with about a third of its land below sea level, relies on this system to keep the land dry and usable for agriculture, habitation, and infrastructure. The Dutch canal system, partly driven by gravity, forms a core part of the country's extensive water management strategies.



Key Features of the Dutch Gravity Canal System

Gravity-Based Drainage:

- The Dutch canal system uses the principle of gravity for water flow wherever possible, meaning that water naturally flows from higher ground to lower ground and eventually to the sea or larger rivers.
- Gravity is harnessed in regions where slight elevation differences allow water to be directed into channels and prevent flooding without the need for extensive pumping.

Integration of Canals, Dikes, and Locks:

- The canal system is integrated with dikes (large embankments) and locks (gated structures) to regulate water levels in different areas.
- **Dikes** keep water out of low-lying areas, and **locks** allow controlled water transfer between canals and water bodies, ensuring that water levels are stable even during heavy rains or high tides.

Polders and Drainage:

- The Dutch have reclaimed land from the sea, creating areas known as **polders**. These are low-lying tracts of land that are drained and separated from the surrounding water by dikes.
- Water in polders is often higher than the surrounding land, so gravity canals are used alongside **sluices** to discharge excess water when levels get too high.

Use of Windmills and Pumps:

- While gravity is used wherever possible, Dutch canals often need support from mechanical means, especially in areas with minimal elevation difference.
- Historically, windmills were used to pump water out of polders and into drainage canals. Today, these are complemented or replaced by powerful electric and diesel pumps.

Flood Management and Safety:

- The canal system is central to flood management in the Netherlands. When excess water from rivers or rainfall needs to be discharged, water is routed through the canal network to discharge points along the coast.
- **Storm surge barriers** and **delta works** help protect the lowlands from the North Sea's tides, ensuring that inland areas remain dry.

Water Quality and Ecology:

- Dutch canals are also managed for water quality, maintaining ecological balance and ensuring clean water for both people and wildlife.
- Gravity canals help maintain a natural flow that supports ecosystems within the canals, contributing to healthier aquatic environments.

Modern Innovations:

- The Dutch water management system is continuously updated with modern technology, including **automated sluices, monitoring systems, and real-time flood forecasting**. These innovations are essential for adapting to climate change, which has made sea levels rise and increased the risk of severe weather events.

Global Influence:

The Dutch gravity canal and water management system is regarded as a model worldwide. The expertise developed in the **Netherlands is often shared internationally**, with Dutch engineers consulting on water management projects in flood-prone areas around the world. The Dutch gravity canal system exemplifies a balance of engineering, natural principles, and innovation, showcasing how the Netherlands has successfully managed water for centuries in one of the most flood-vulnerable areas in the world.

HotSpot Technology

Why in News? The Hotspot technology was recently recommended in cricket too as it is generally used in Military purposes.

What is Hot spot" technology? Nicolas Bion, a noted French instrument maker in the early **18th century**, developed various optical and measuring instruments, some of which later influenced advancements in **"hot spot" technology in military applications**.

- Although Bion himself did not directly create **"hot spot technology"** as we know it today, his work on precision instruments laid foundational principles that modern technology builds upon.
- In the military, hot spot technology is often related to **thermal imaging and infrared detection systems**, which identify temperature variations. This technology is used in various scenarios:
- **Surveillance and Reconnaissance:** Hot spot detection through thermal imaging allows military personnel to detect and track enemy forces, even in low visibility, by observing heat emissions from personnel, vehicles, or equipment.
- **Targeting and Guidance:** Heat signatures are used to track and lock onto targets, providing accuracy in missile and drone systems.
- **Search and Rescue Operations:** Hot spot technology helps locate personnel in adverse conditions (like forested areas or combat zones) by detecting body heat or heat from equipment.

- **Maintenance and Diagnostics:** In equipment diagnostics, hot spot technology identifies areas of overheating or energy loss in machinery, helping to prevent failures before they occur.

Kodo millet plants /CPA (cyclopiazonic acid)

Why in News? According to the toxicology report of the 10 elephants that died at Bandhavgarh Tiger Reserve, they had consumed a “large quantity” of kodo millet plants that were infected with a fungus.

- Presence cyclopiazonic acid was detected in all pooled samples. Approximate concentration of cyclopiazonic acid detected in the sample was above 100 ppb. Further screening of all the samples is being made to estimate the exact concentration...
- The results indicate that the elephants might have consumed large quantities of kodo plant/grains.

Key Finding of report :

According to a 2023 research paper titled ‘Potential Risk of Cyclopiazonic Acid Toxicity in Kodua Poisoning’, published in the Journal of Scientific and Technical Research, the kodo millet is **mainly cultivated in dry and semi-arid regions**.

But sometimes, “environmental conditions like spring and summer strike as being suitable for a certain kind of poisoning, which leads to greater economic crop loss”

- “CPA (cyclopiazonic acid) is one of the major **mycotoxins associated** with the kodo millet seeds causing kodo poisoning, which was first recognised during the mid-eighties.”
- **Millets are more prone to fungal infection**, followed by bacterial and viral; these infections adversely affect the grain and fodder yield.
- Ergot is a parasitic fungal endophyte that grows in the ear heads of various blade grass, most frequently on kodo millet. Consumption of such kodo grains is often found to cause poisoning.

About Bandhavgarh Tiger Reserve:

- It is located in the **Umari district of Madhya Pradesh**, India, is one of the most famous tiger reserves and national parks in India, known for its **high density of Bengal tigers**.
- Established as a national park in 1968 and later declared a tiger reserve in 1993 under Project Tiger, Bandhavgarh is celebrated for its successful tiger conservation efforts and diverse flora and fauna.

The State of Food and Agriculture 2024' (SOFA 2024):

Why in News? The Food and Agriculture Organisation (FAO) has recently released 'The State of Food and Agriculture 2024' (SOFA 2024).

Key Findings:

- **True Cost Accounting:** The report calls for the importance of true cost accounting in agrifood systems.
- It helps to uncover the hidden costs and benefits associated with food production and consumption, including environmental degradation, health impacts, and social inequalities.
- the hidden costs of agrifood systems amounted to approximately \$12 trillion annually.
- Globally, the dominant quantified hidden costs were those arising from unhealthy dietary patterns that lead to diseases and lower labour productivity.
- India's hidden costs are the third largest globally, following China and the United States, which have hidden costs of **\$1.8 trillion** and **\$1.4 trillion**, respectively.
- The health-related hidden costs, which include productivity losses due to dietary-related diseases, form a significant portion of the total.
- These costs are estimated to be around \$846 billion annually, reflecting the burden of disease and reduced labour productivity.
- **Dietary Risks and Non-Communicable Diseases:** Unhealthy diets are a major contributor to global hidden costs, accounting for approximately 70% (\$8.1 trillion) of these costs.
- The report underscores the link between dietary risks and non-communicable diseases, highlighting the need for healthier food environments.
- **Economic, Social, and Environmental Impacts:** Agrifood systems generate significant benefits for society but also have substantial negative impacts.
- The report identifies these hidden costs, which include economic losses from market and policy failures, and emphasises the need for comprehensive assessments to inform policy decisions.
- It calls for greater consumer awareness and engagement, as well as equitable roles for producers in the supply chain.

Key Recommendations :

- Promoting Healthier Diets:
- Sustainable Agricultural Practices:

- Improving Social Equity: .
- These include incentivising sustainable practices, improving institutional and fiscal capacities, and engaging stakeholders in the transformation process.

About The SOFA:

- The State of Food and Agriculture (SOFA) is an annual report published by **the Food and Agriculture Organization (FAO) of the United Nations**.
- The report provides an in-depth analysis of key issues affecting global agriculture, food security, rural development, and nutrition.
- It is a valuable resource for **policymakers, researchers, and stakeholders** in the agri-food sector, offering data-driven insights and policy recommendations to address challenges within the global food system.

LignoSat:

The first wood-panelled satellite, named LignoSat, was recently launched into space. This spacecraft aims to explore the viability of timber as a renewable building material for future space missions.

- It has been developed by Kyoto University in collaboration with Sumitomo Forestry, LignoSat

What is LignoSat?

- LignoSat is a compact satellite measuring just 10 centimetres on each side and weighing 900 grams. It is constructed from panels made of magnolia wood.
- The design employs traditional Japanese craftsmanship without screws or glue. The name “LignoSat” derives from the Latin word for wood, denoting its unique composition.

Purpose of the Mission:

- The mission aims to test wood’s durability in the harsh conditions of space. Temperatures in space can swing dramatically, ranging from -100 to 100 degrees Celsius every 45 minutes. LignoSat will also assess wood’s effectiveness in shielding semiconductors from space radiation.

Booker Prize 2024 :

Samantha Harvey has won the prestigious **Booker Prize** for her novel “Orbital”. The award ceremony took place on **November 12, 2024**.

- Harvey’s book is a unique exploration of life aboard the International Space Station. It reflects on human connections and the beauty of Earth. The novel was inspired by the isolation experienced during the COVID-19 pandemic.

About the Booker Prize :

- It is one of the world's most prestigious literary awards, was established in 1969 to recognize outstanding works of fiction written in English.
- Initially, it was limited to writers from the Commonwealth, **Ireland, and South Africa**, but in 2014, eligibility was expanded to any novel written in English and published in the United Kingdom.
- This opened the competition to authors worldwide, increasing its influence and significance in the literary world.

India Tests Fire Hypersonic Missiles

Why in News? India’s Defence Research and Development Organisation (DRDO) successfully conducted the first flight test of a long-range hypersonic missile. The missile was launched from Dr. APJ Abdul Kalam Island, off the coast of Odisha.

Key features:

Speed: Capable of traveling at speeds greater than Mach 5 (6,174 km/h)

Range: Greater than 1,500 km

Target Capability: Can hit both moving sea targets and static land targets.

Countries with Hypersonic Technology

- **Russia and China** are ahead in the development of hypersonic missiles.
- The United States is actively working on hypersonic missile systems.
- Other nations like **France, Germany, Japan, Australia, Iran, and Israel** are also pursuing hypersonic missile projects.

What Are Hypersonic Missiles?

Hypersonic missiles are advanced weapons that travel at speeds greater than **Mach 5** (five times the speed of sound, approximately **6,200 km/h** or **3,850 mph**) and are capable of

maneuvering mid-flight. These features make them significantly faster and more agile than traditional ballistic or cruise missiles.

Types of Hypersonic Missiles:

Hypersonic Glide Vehicles (HGVs):

- Launched atop a rocket and released at high altitudes.
- Glide through the atmosphere at hypersonic speeds, maneuvering unpredictably to evade missile defense systems.
- Example: China's **DF-ZF**, U.S. **Advanced Hypersonic Weapon**.

Hypersonic Cruise Missiles (HCMs):

- Powered by advanced air-breathing engines, such as scramjets, throughout their flight.
- Travel within the Earth's atmosphere, maintaining a sustained hypersonic speed.
- Example: Russia's **Zircon**, India's **BrahMos-II** (under development).



Key Features of Hypersonic Missiles

Extreme Speed:

- Travel faster than Mach 5, reducing the time for a target to react or defend.
- A missile could strike a target thousands of kilometers away in minutes.

Maneuverability:

- Unlike ballistic missiles that follow a predictable arc, hypersonic missiles can change their trajectory mid-flight, making them hard to detect and intercept.

Low Altitude:

- Fly closer to the ground than traditional intercontinental ballistic missiles (ICBMs), making them less visible to radar systems.

Dual-Use Capability:

- Can be equipped with conventional or nuclear warheads, adding strategic ambiguity.

Advantages of Hypersonic Missiles**Evasion of Defense Systems:**

- Their speed and agility make them nearly impossible to intercept using current missile defense technology.

Precision Targeting:

- Designed for pinpoint accuracy, useful for destroying high-value targets like military bases, ships, or critical infrastructure.

Strategic First-Strike Capability:

- Allows nations to strike quickly and decisively, potentially neutralizing adversary defenses before retaliation.

Why has CO₂ caused most of the global warming? What is Radiative Forcing (RF) ?

Why in News? Studies have shown that CO₂ has contributed more than any driver to climate change. In fact, CO₂ is responsible for about **70% of global warming**, according to an analysis by Facts on Climate Change, a Czech Republic-based independent think tank.

- In 2013, the Intergovernmental Panel on Climate Change (IPCC) — the United Nations body that advances scientific knowledge about climate change — compared the “**radiative forcing**” (RF) or heating effect of three different climate drivers: GHGs, aerosols, and land use change. It was found that between **1750 and 2011**, CO₂ had the highest positive RF, meaning it had the greatest warming effect on the planet.
- The analysis also showed that other GHGs such as CH₄ or Hydrofluorocarbons (an entirely human-made GHG) which are much more potent — while CH₄ is around 80 times more powerful than CO₂, HFCs can be thousands of times more powerful — had less heating effect than CO₂.

There are two reasons for this.

One, CO₂ is much more abundant in the atmosphere compared to CH₄ and HFCs. Since the onset of industrial times in the 18th century, human activities have raised atmospheric CO₂ by **50%**, which means the amount of CO₂ is now **150% of its value** in 1750, according to a report in the National Aeronautics and Space Administration (NASA).

Two, CO₂ remains in the atmosphere longer than the other major GHGs emitted due to human activities. It takes about a decade for CH₄ emissions to leave the atmosphere (it converts into CO₂) and about a century for nitrous oxide (N₂O).

- “After a pulse of CO₂ is emitted into the atmosphere, **40%** will remain in the atmosphere for **100 years** and **20% will reside for 1000** years, while the final 10% will take 10,000 years to turn over,” a report by the Union of Concerned Scientists (UCS), a US-based non-profit organisation,
- Notably, water vapour is the most abundant GHG in the atmosphere. However, it has a short cycle (10 days on average) and does not build up in the atmosphere in the same way as CO₂ does. Therefore, water vapour does not have much heating effect compared to CO₂. But as global temperatures continue to soar, more water evaporates into the atmosphere, causing more warming.

What is Radiative Forcing (RF) ?

Radiative Forcing (RF) refers to the change in the balance between incoming energy from the sun and outgoing energy from Earth due to factors like greenhouse gases, aerosols, or solar radiation changes.

How it Works?

Incoming Solar Energy: The sun emits energy that reaches Earth. Some of this energy is reflected back into space by clouds, aerosols, and Earth's surface.

Outgoing Infrared Energy: Earth emits energy back to space as infrared radiation after absorbing solar energy.

Imbalance: Radiative forcing measures the change caused by factors that alter this balance.

For example:

Positive RF warms the planet (e.g., from CO₂ or methane trapping more heat).

Negative RF cools the planet (e.g., from aerosols reflecting sunlight away).

Types of Radiative Forcing:

Greenhouse Gases:

- Carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) are major contributors to positive radiative forcing, as they trap heat in the atmosphere.

Example: Increasing CO₂ from burning fossil fuels leads to a net warming effect.

Aerosols:

- Tiny particles like sulfate aerosols can reflect sunlight, causing negative RF and a cooling effect.

Example: Volcanic eruptions release aerosols, temporarily cooling the planet.

Solar Radiation:

- Variations in the sun's energy output can cause RF, although its contribution to recent warming is much smaller compared to greenhouse gases.

Land Use Changes:

- Deforestation or urbanization alters Earth's albedo (reflectivity), contributing to RF by changing how much sunlight is absorbed or reflected.

Fossil Fuel Non-Proliferation Treaty (FFPT)?

Why in News ? A group of governments and civil society organisations believe that fossil fuels should be regulated the way nuclear weapons are, and are pushing the idea of a **fossil fuel non-proliferation treaty (FF-NPT)**.

What is Fossil Fuel Non-Proliferation Treaty (FFPT)?

The **Fossil Fuel Non-Proliferation Treaty (FFPT)** is an international initiative aimed at addressing the global reliance on fossil fuels—coal, oil, and gas—by phasing out their production and use. It draws inspiration from successful global treaties like the **Nuclear Non-Proliferation Treaty** and seeks to tackle the root cause of climate change by focusing on the fossil fuel industry.

- The FF-NPT proposes to make it legally binding on nations to end fossil fuel extraction, wind down existing production, and manage a just transition to renewable energy.

It operates on **three pillars** —

- **Non-proliferation**, which is a global cooperation model to end the expansion of coal, oil and gas production;
- **a fair phase-out**, which comprises an equitable plan to shut down existing fossil fuel production in a way that nations with the capacity and historical responsibility for emissions transition fastest and empowers others;

- 'just transition', which calls for fast-tracking the adoption of renewable energy and economic diversification away from fossil fuels such that no worker, community or country is left behind.
- Since it was conceptualised in 2016 and officially launched in 2019, the FF-NPT has hit the wall of finance.

Key Objectives of the FFPT

Prevent the Expansion of Fossil Fuels:

- Halt the development of new fossil fuel projects.
- End exploration and subsidies for coal, oil, and gas production.

Phase Out Existing Production:

- Implement a fair and just transition plan to phase out existing fossil fuel production, ensuring it aligns with the **1.5°C target** under the Paris Agreement.

Promote Clean Energy Transition:

- Support investments in renewable energy sources and technologies.
- Focus on equity, ensuring developing countries have access to resources for the energy transition.

National Asset Reconstruction Company Limited (NARCL):

Why in News? The Finance Minister has recently urged lenders not to overburden customers with insurance products they do not require, and focus on mobilising deposits and lending; banks also nudged to be 'more assertive' on resolving distressed assets through NARCL.

About the National Asset Reconstruction Company Limited (NARCL):

- The National Asset Reconstruction Company Limited (NARCL), often referred to as a "**bad bank**", is an entity established by the Government of India to help resolve the issue of non-performing assets (NPAs) in the banking system.
- It focuses on **purchasing and managing large-value bad loans from commercial** banks to clean up their balance sheets and improve their capacity to lend to productive sectors of the economy.

Why NARCL was Created?

- **Rising NPAs:** Indian banks, especially public sector banks, have been burdened with high levels of NPAs. This limits their ability to lend and affects their financial stability.

- **Stalled Lending Cycle:** Banks stuck with bad loans cannot lend effectively to businesses, impacting economic growth.
- **Need for a Centralized Solution:** Individual banks handling bad loans on their own was inefficient. A specialized institution like NARCL was created to manage these loans centrally and systematically.

Key Features of NARCL

Majority-owned by Public Sector Banks (PSBs).

- It operates in collaboration with the India Debt Resolution Company Limited (IDRCL), which is tasked with managing and resolving the bad loans.
- It aims to take over large-value NPAs (Rs500 crores and above) from banks.
- The government provides a **Rs 30,600 crore guarantee** to back security receipts issued by NARCL, minimizing risks for banks.
- NARCL buys NPAs from banks at a discounted rate, issues security receipts to banks for the purchased loans, and collaborates with IDRCL to recover or resolve the debts.

The Acquisition Strategy:

Payment Structure:

- **15% in Cash:** NARCL pays 15% of the agreed value of the bad loan upfront in cash to the bank.
- **85% in Security Receipts (SRs):** The remaining 85% of the payment is made in the form of **security receipts (SRs)**, which are financial instruments representing the loan's value.

Government Guarantee:

- The SRs issued by NARCL are backed by a **government guarantee** worth ₹30,600 crores.
- The guarantee is valid for **five years**, ensuring that banks receive the payment in case of shortfalls in recovery.

Focus on Large-Value NPAs:

- NARCL primarily targets loans worth ₹500 crores or more to maximize its impact.

Value Determination:

- The valuation of the bad loan is based on its **expected recovery value** rather than the loan's original or outstanding amount.
- This ensures that the pricing reflects the realistic chances of recovery.

High-performance buildings (HPBs)/How can design help a building be more climate-resilient?

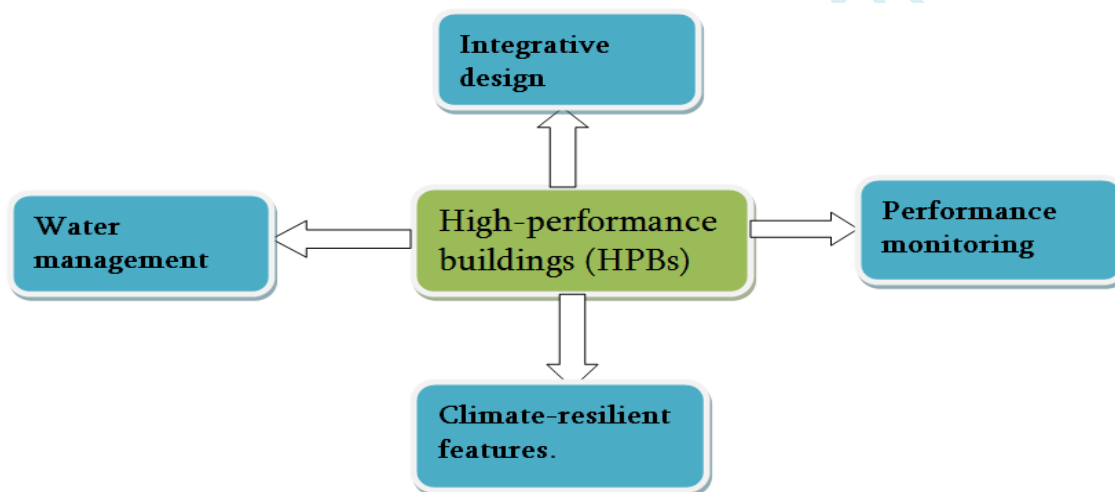
Why in News ? High-performance buildings are at the forefront of sustainable construction, focusing on energy efficiency, resource conservation, and climate resilience through

integrative design and the use of sustainable materials; they **employ passive and active strategies to minimise environmental impact**

What are High-performance buildings (HPBs)?

High-performance buildings (HPBs) are structures designed to deliver superior levels of energy efficiency, sustainability, comfort, and operational performance.

- High-performance buildings (HPBs) are at the forefront of sustainable construction, tackling urgent needs like energy efficiency, climate resilience and resource conservation. As climate change intensifies, resources become scarcer, and urbanisation increases, HPBs — built to consume less energy, conserve resources, and withstand unpredictable weather — are an important part of achieving and keeping sustainable living.



- Building an HPB requires key practices such as **integrative design**, **lifecycle-based materials**, efficient energy and water management, **performance monitoring**, and climate-resilient features.

What is integrative design?

- At the core of HPBs is an integrative design approach that encourages architects, engineers, sustainability consultants, and building owners to work together and set measurable performance goals.
- These goals might aim for, say, **90% daylighting in occupied spaces** or cooling in **700 sq. ft. per tonne** of air-conditioning in commercial buildings. This approach ensures all building systems — air-conditioning, lighting, and building envelope components like walls, roofs, and windows — work together smoothly.
- **Digital modelling also plays a crucial role** by creating a virtual representation of the project, allowing the team to predict performance outcomes, guide optimal system

sizing, and test different strategies. With simulations, the team can adjust their strategies to meet energy-saving and thermal comfort goals before construction even begins. This predictive approach helps achieve high operational efficiency, improves resilience, and reduces long-term costs.

- **An example of an integrative design process in HPBs** is the early use of passive design strategies, whereby designers make the most of **natural sunlight and plan** to use materials that retain heat (thermal mass). These strategies reduce heating and cooling demands, allowing designers to choose equipment of the right size.

The Army Tactical Missile System (ATACMS):

Why in News ? The USA has recently allowed Kyiv to use the Army Tactical Missile System, also known as ATACMS, inside Russia.

What is ATACMS?

- The Army Tactical Missile System (ATACMS) is a surface-to-surface missile developed by the United States.
- It is designed to provide long-range precision strikes against high-value, time-sensitive targets, such as enemy command centers, air defense systems, logistics hubs, and concentrations of troops. Manufactured by Lockheed Martin, ATACMS missiles are fired from mobile launchers like the M270 Multiple Launch Rocket System (MLRS) and the M142 High Mobility Artillery Rocket System (HIMARS).

Key Features of ATACMS:

- Depending on the variant, ATACMS has a range of up to 300 kilometers (186 miles), enabling strikes far behind enemy lines.
- Equipped with either a unitary warhead (for precision strikes) or cluster munitions (dispersing submunitions over a wide area).
- Utilizes a combination of inertial navigation and GPS for precise targeting.
- Can be used in all weather conditions and against a variety of targets.
- Compatible with U.S.-supplied HIMARS and MLRS systems, widely used by NATO allies and partners.

What is the Storm Shadow (SCALP EG)?

The Storm Shadow is a long-range air-launched cruise missile developed by MBDA, a European defense contractor.

- It is designed for precision strikes against high-value, well-protected targets such as bunkers, air defense systems, command centers, and infrastructure. The missile

is primarily used by the **Royal Air Force (RAF)** of the United Kingdom, the French Air Force, and other NATO allies.

Key Features of Storm Shadow (SCALP EG):

- The Storm Shadow has an impressive range of **250-300 kilometers (155-186 miles)**, allowing it to strike targets deep within enemy territory while keeping the launch platform out of enemy air defenses' reach.
- It is equipped with a combination of inertial navigation, GPS, and a terrain reference navigation system (TERCOM), enabling it to follow precise flight paths, even in adverse weather conditions or GPS-jamming environments.
- The missile carries a 200-kg (440 lb) Broach warhead, which is capable of penetrating hardened targets, including bunkers, command and control facilities, and infrastructure.
- The Storm Shadow can be launched from twin-engine aircraft such as the Tornado **GR4, Eurofighter Typhoon, and Rafale**, which are equipped to carry and deploy the missile.
- Storm Shadow has been used in various military conflicts, including the Libyan Civil War (2011), Syria, and Iraq, demonstrating its effectiveness in modern warfare scenarios.

Significance and Geopolitical Implications:

- Storm Shadow/SCALP EG provides the military with a powerful means to project force at long distances with precision, allowing it to neutralize critical enemy assets without the need for ground invasion.
- Its ability to strike deep into enemy territory makes it an important deterrent against threats to national security, as it complicates an adversary's planning and response.
- The use of Storm Shadow is significant in the context of international defense cooperation, particularly within NATO, where its deployment in allied forces strengthens joint operations and interoperability.

Flue Gas Desulphurisation (FGD):

What is Flue Gas Desulphurisation (FGD)?

It refers to the process of removing sulfur dioxide (SO₂) from the exhaust gases produced by burning fossil fuels in power plants, industrial facilities, and other combustion processes. It is

a key technology used to control air pollution, particularly to comply with stringent emissions regulations.

Significance of FGD:**Air Pollution Control:**

- Reduces SO₂ emissions, a primary contributor to acid rain and respiratory illnesses.

Environmental Compliance:

- Helps industries meet regulatory standards, such as India's SO₂ emission norms for thermal power plants.

Improved Public Health:

- Mitigates the health risks associated with SO₂ exposure, such as asthma and lung diseases.
- Circular Economy:
- By-products like gypsum can be used in industries like construction and agriculture.

One Nation One Subscription (ONOS):

Why in News? Prime Minister Narendra Modi-led Union Cabinet has recently approved 'One Nation One Subscription', a new central government scheme to ensure country-wide access to scholarly research articles and journal publications.

The Modi government has allocated Rs 6,000 crore for a period of three years for the initiative which is in line with the goals of **Viksit Bharat @ 2047**, National Education Policy (NEP) 2020 and Anusandhan National Research Foundation (ANRF).

Key features of One Nation One Subscription (ONOS):

- A total of 30 major international journal publishers have been included in the One Nation One Subscription scheme.
- All of the nearly **13,000 e-journals** published by these publishers will be accessible to more than 6,300 government higher education institutions and central government R&D institutions.
- The scheme will be administered through a simple, user-friendly and fully digital process.
- A total of about **Rs 6,000 crore** has been allocated for three calendar years — 2025, 2026 and 2027.
- The benefits of the scheme will be provided through a national subscription coordinated by a central agency, namely the **Information and Library Network (INFLIBNET)**, an autonomous inter-university centre of the University Grants Commission (UGC).

- The Department of Higher Education will have a unified portal, **One Nation One Subscription**, through which the institutions can access the journals.
- The **state governments** will also be requested to carry out campaigns at their level to **maximise usage of the unique** facility by students, faculty and researchers of all government institutions.

PAN 2.0 Project:

Why in News? The Union Cabinet approved the PAN 2.0 Project recently, for PAN to be made the “the common identifier for businesses” and to make PAN as the “single source of truth and data consistency”.

- The 10-digit alphanumeric Permanent Account Number (PAN), issued by the Income Tax Department, is set for an upgrade, with a QR code to be incorporated in all new and old cards, a completely online application process, a merger of all existing identification numbers to **make PAN as the common identifier** for businesses, in addition to a data vault system for data protection and cybersecurity purposes.
- **With the upgrade**, PAN is expected to become a strong source of identification and information for the authorities, as it is already linked to the other identification number of Aadhaar.
- The existing **PAN holders, which are around 78 crore in number**, can upgrade their PAN cards. The number or PAN will remain the same for existing users, but the card will need to be upgraded, which the government said would be free of cost for the users.

What is the PAN 2.0 Project?

- Under the project, the existing PAN system will be upgraded completely, the IT backbone will be revamped and PAN will be made as a common business identifier for all digital systems of specified government agencies.

What are the features of PAN 2.0?

- Apart from the QR-code feature for all new and existing PAN cards, the PAN 2.0 project aims to set up a unified portal along with a “**mandatory PAN data vault system**” for all entities using PAN data. This is being done for data protection and cybersecurity purposes.
- “One of the most important features would be a **PAN data vault system**. The PAN related information is used by many entities such as banks, insurance companies.

- Those (entities) who take details of PAN, they will have to keep PAN data safely, mandatorily through the data vault system.
- There will also be a unified portal as the existing software is nearly 15-20 years old.
- **The PAN 2.0 project will enable technology-driven transformation of taxpayer registration services with an aim to improve ease of access and service delivery.**
- This will be an upgrade of the current PAN/TAN 1.0 eco-system consolidating the core and non-core PAN/TAN activities as well as PAN validation service.

What does this mean for individuals and businesses?

- Existing users will have the option to upgrade for the PAN 2.0 card. The details about the application process and the timeline are yet to be released by the Income Tax Department.
- The QR-code feature on new and old PAN cards will mean an **enhanced level of integration of financial transactions with the tax department**. The QR code was introduced in PAN in 2017.
- “The existing PAN card holders can regenerate the old PAN card to the QR code-enabled ones. PAN holders having an old PAN Card without QR code have an option to apply for a new card with QR code. In PAN 2.0, the submission of applications is going to be online (paperless),”

What are the existing identification numbers of PAN and TAN?

- A 10-digit alphanumeric number, PAN, enables the Income Tax Department to link all transactions of a person with the department. These transactions include tax payments, **Tax Deducted at Source (TDS)** / Tax Collected at Source (TCS) credits, returns of income, specified transactions. PAN, thus, acts as an identifier for the person with the tax department. Once PAN is allotted, it remains the same forever. It is mandatory to quote **PAN on filing of income tax return**.
- TAN stands for Tax Deduction and Collection Account Number, which is a 10-digit alphanumeric number issued by the Income Tax Department. TAN needs to be obtained by all **persons responsible for deducting or collecting tax at source**. It is compulsory to quote TAN in TDS/TCS return, any TDS/TCS payment challan, TDS/TCS certificates

Narsapur lace craft:

The famous Narsapur lace craft has recently bagged the prestigious Geographical Indication (GI) tag.

- Narsapur Lace Craft is a traditional handicraft originating from the Narsapur region in the West Godavari district of Andhra Pradesh, India.

About the Narsapur Lace Craft:

- The craft dates back to the colonial period, introduced by Irish missionaries in the **19th century**.
- Local women adapted the techniques, creating a unique style using crochet.
- It involves **crochet lace-making, a form of needlework** using fine threads and a hooked needle.
- **Patterns are intricate**, and the process is entirely handmade.
- The primary materials are cotton and silk threads.
- These are **dyed in vibrant colors** to create delicate lace patterns.
- Items include **tablecloths, curtains, doilies, garments, bedspreads**, and accessories like bags and caps.
- The designs are inspired by nature, including flowers, leaves, and geometric patterns.

Basic Statistical Return (BSR):

Why in News? The RBI has recently released quarterly Basic Statistical Return (BSR).

What is Basic Statistical Return (BSR)?

- It refers to a set of statistical returns that banks are required to submit to the Reserve Bank of India (RBI).
- These returns are designed to collect granular data about various banking activities, such as deposits, advances, and investments.
- The information is crucial for policy formulation, economic analysis, and regulatory purposes.

Purpose of Basic Statistical Returns:

Policy Formulation: Helps RBI in designing monetary policies and assessing their impact.

Economic Analysis: Provides data for analyzing banking sector trends and their influence on the economy.

Regulation and Supervision:

- Assists RBI in monitoring compliance with regulatory requirements.

Data Dissemination: Serves as a source of information for researchers, policymakers, and other stakeholders.

Types of BSR Reports:

- The BSR system primarily includes the following:

BSR-1 (Advances Data):

- Captures detailed information on loans and advances granted by banks.
- Parameters include borrower details (sector, size, purpose, etc.), interest rates, and type of loan.

BSR-2 (Deposit Data):

- Focuses on deposits held by banks.
- Includes information on types of deposits (savings, current, term), ownership (individuals, corporates, government), and interest rates.

BSR-4 (Credit Monitoring Arrangement Data):

- Covers large advances for credit monitoring.

BSR-5 and Others:

- Collects other banking-related statistical data.

Global Cooperative Conference 2024:

Why in News? Prime Minister Narendra Modi launches the United Nations International Year of Cooperatives 2025 and released a commemorative postage stamp at **Bharat Mandapam in New Delhi**.

Prime Minister Shri Narendra Modi also launched the **United Nations' International Year of Cooperatives 2025**.

Key Points of the conference:

- The theme of the conference is based on '**Sahkar Se Samriddhi**' given by PM 3 yrs back.
- Through 2 lakh new **Primary Agricultural Credit Societies (PACS)**, almost all village panchayat will have cooperative society
- The farmers of India will be able to increase their access to the domestic as well as global market through National Cooperative Exports Limited (**NCEL**), National Cooperative Organics Limited (**NCOL**) and Bharatiya Beej Sahakari Samiti Limited (**BBSSL**)
- Indian Farmers Fertiliser Cooperative (**IFFCO**), Krishak Bharti Cooperative (**KRIBHCO**) and Amul have set examples in the field of cooperatives all over the world

- The government will establish a **cooperative university**

Key Objectives:

- Reaffirming the role of cooperatives as **people-centered and purpose-driven** organizations that contribute to social and economic equality
- Highlighting cooperatives' contributions to **tackling climate change**, including initiatives like planting 10,000 Peepal trees to offset carbon footprints and advocating for carbon neutrality
- Developing strategies to create **supportive policies and entrepreneurial ecosystems** that enhance the effectiveness of cooperatives
- **Establishing an Action Agenda to align cooperative initiatives** with the Sustainable Development Goals (SDGs)
- Encouraging purposeful leadership to **build just, equitable, and resilient societies**
- Offering a platform for **global participants to share ideas, showcase innovations**, and strengthen inter-cooperative collaborations.

About the Primary Agricultural Credit Societies (PACS):

- Primary Agricultural Credit Societies (PACS) are grassroots-level cooperative institutions in India, primarily catering to the financial needs of farmers.
- They are the **smallest and most basic units** in the three-tier structure of cooperative credit in India, which includes:
- PACS at the **village level**.
- District Central Cooperative Banks (DCCBs) at the **district level**.
- State Cooperative Banks (SCBs) at the **state level**.

Zantac/N-nitrosodimethylamine (NDMA):

Why in News ? GSK, a leading multinational pharmaceutical company was recently sued by the US Food and Drug Administration (FDA) and the European Medicines Agency (EMA) that banned Zantac sales due to high NDMA levels, a cancer-causing chemical.

About Zantac:

- Zantac (ranitidine) is a widely used medication previously prescribed to treat conditions like **heartburn, acid reflux, and stomach ulcers**.
- However, it became the subject of lawsuits and regulatory actions after it was discovered that **ranitidine products could contain NDMA** (N-nitrosodimethylamine), a chemical classified as a probable human carcinogen by the World Health Organization (WHO) and other health bodies.

About NDMA:

- NDMA (N-nitrosodimethylamine) is a chemical compound that is considered a probable **human carcinogen**, meaning it can potentially cause **cancer in humans**.
- It is a member of the **nitrosamine family** of chemicals, which are often produced during certain chemical reactions, such as when organic compounds like **ranitidine** (the active ingredient in Zantac) degrade.

Sources of NDMA: NDMA can form naturally in some foods (like cured meats) and beverages, but it is also used in industrial processes.

- The compound can also form in drugs like ranitidine when they are exposed to heat or when they degrade over time. This is why it became a concern when it was found in Zantac and other similar drugs.

Health Risks:

- Long-term exposure to high levels of NDMA can increase the risk of cancer, particularly cancers affecting the liver, kidneys, and digestive tract.
- NDMA is known to be **toxic and can damage DNA**, which can lead to **cancerous cell growth**.

Regulatory Concerns:

- The discovery of **NDMA in Zantac** led to major concerns, prompting drug recalls and **bans** in various countries, including **the U.S. and Europe**.
- Regulatory bodies like the **U.S. FDA** and the **European Medicines Agency (EMA)** started investigating the presence of NDMA in ranitidine products, and in 2020, they recommended suspending sales of **Zantac and similar drugs due to unsafe levels of NDMA**.

Legal Implications:

- Lawsuits have been filed by consumers who claim that their cancer diagnoses were caused by taking Zantac, with accusations that the company did not adequately warn consumers about the risks.

Basic Statistical Return (BSR):

Why in News? The RBI has recently released quarterly Basic Statistical Return (BSR).

What is Basic Statistical Return (BSR)?

- It refers to a set of statistical returns that banks are required to submit to the Reserve Bank of India (RBI).
- These returns are designed to collect granular data about various banking activities, such as deposits, advances, and investments.
- The information is crucial for policy formulation, economic analysis, and regulatory purposes.

Purpose of Basic Statistical Returns:

Policy Formulation: Helps RBI in designing monetary policies and assessing their impact.

Economic Analysis: Provides data for analyzing banking sector trends and their influence on the economy.

Regulation and Supervision:

- Assists RBI in monitoring compliance with regulatory requirements.

Data Dissemination: Serves as a source of information for researchers, policymakers, and other stakeholders.

Types of BSR Reports:

- The BSR system primarily includes the following:

BSR-1 (Advances Data):

- Captures detailed information on loans and advances granted by banks.
- Parameters include borrower details (sector, size, purpose, etc.), interest rates, and type of loan.

BSR-2 (Deposit Data):

- Focuses on deposits held by banks.
- Includes information on types of deposits (savings, current, term), ownership (individuals, corporates, government), and interest rates.

BSR-4 (Credit Monitoring Arrangement Data):

- Covers large advances for credit monitoring.

BSR-5 and Others:

- Collects other banking-related statistical data.

Global Cooperative Conference 2024:

Why in News? Prime Minister Narendra Modi launches the United Nations International Year of Cooperatives 2025 and released a commemorative postage stamp at **Bharat Mandapam in New Delhi**.

Prime Minister Shri Narendra Modi also launched the **United Nations' International Year of Cooperatives 2025**.

Key Points of the conference:

- The theme of the conference is based on '**Sahkar Se Samriddhi**' given by PM 3 yrs back.
- Through 2 lakh new **Primary Agricultural Credit Societies (PACS)**, almost all village panchayat will have cooperative society
- The farmers of India will be able to increase their access to the domestic as well as global market through National Cooperative Exports Limited (**NCEL**), National Cooperative Organics Limited (**NCOL**) and Bharatiya Beej Sahakari Samiti Limited (**BBSSL**)
- Indian Farmers Fertiliser Cooperative (**IFFCO**), Krishak Bharti Cooperative (**KRIBHCO**) and Amul have set examples in the field of cooperatives all over the world
- The government will establish a **cooperative university**

Key Objectives:

- Reaffirming the role of cooperatives as **people-centered and purpose-driven** organizations that contribute to social and economic equality
- Highlighting cooperatives' contributions to **tackling climate change**, including initiatives like planting 10,000 Peepal trees to offset carbon footprints and advocating for carbon neutrality
- Developing strategies to create **supportive policies and entrepreneurial ecosystems** that enhance the effectiveness of cooperatives
- **Establishing an Action Agenda to align cooperative initiatives** with the Sustainable Development Goals (SDGs)
- Encouraging purposeful leadership to **build just, equitable, and resilient societies**
- Offering a platform for **global participants to share ideas, showcase innovations**, and strengthen inter-cooperative collaborations.

About the Primary Agricultural Credit Societies (PACS):

- Primary Agricultural Credit Societies (PACS) are grassroots-level cooperative institutions in India, primarily catering to the financial needs of farmers.
- They are the **smallest and most basic units** in the three-tier structure of cooperative credit in India, which includes:
 - PACS at the **village level**.
 - District Central Cooperative Banks (DCCBs) at the **district level**.
 - State Cooperative Banks (SCBs) at the **state level**.

Nagri Dubraj Rice:

The Geographical Indication Registry has granted Chhattisgarh's aromatic rice, Nagri Dubraj, a geographical indication (GI) tag facilitating the brand to get a unique identity and a wide market.

About Nagri Dubraj Rice:

- Nagri Dubraj Rice is a premium variety of aromatic rice cultivated in India, particularly in the **Nagri region of Chhattisgarh**. Known for its distinct fragrance and quality, it is often referred to as the "**Basmati of Chhattisgarh**."

Origin and Cultivation:

- Cultivated predominantly in Chhattisgarh, often in traditional, **small-scale, organic farming practices**.
- The variety thrives in the region's climate and soil, contributing to its unique qualities.

Marine Carbon Dioxide Removal (mCDR):

Why in News ? The term was recently in news regarding the role of ocean in mitigating the climate change.

About Marine Carbon Dioxide Removal (mCDR): A Comprehensive

- Marine Carbon Dioxide Removal (mCDR) encompasses a set of strategies aimed at reducing atmospheric carbon dioxide (CO₂) levels by enhancing the ocean's natural capacity to absorb and store CO₂. These methods leverage the ocean's role as a significant carbon sink, which absorbs approximately 25% of global CO₂ emissions annually.

Key mCDR Approaches:

Ocean Alkalinity Enhancement (OAE):

- Adding alkaline substances like silicate or carbonate minerals to seawater increases the ocean's ability to absorb CO₂.
- Converts CO₂ into stable bicarbonate ions, reducing ocean acidification.

Ocean Fertilization:

- Involves adding nutrients like iron, nitrogen, or phosphorus to stimulate phytoplankton growth.
- Phytoplankton absorb CO₂ during photosynthesis, and some of the carbon sinks to the ocean floor as organic matter after their death.

Artificial Upwelling and Downwelling:

- **Upwelling:** Pumps nutrient-rich deep waters to the surface to promote phytoplankton growth.
- **Downwelling:** Enhances the transport of CO₂-rich surface waters to deeper layers, where CO₂ is stored for centuries.

Macroalgae Cultivation:

- Growing large-scale seaweed farms to capture CO₂.
- Harvested biomass can be used for bioenergy or sequestered by sinking it into the deep ocean.

Electrochemical Methods:

- Using electricity to induce chemical reactions that remove CO₂ from seawater.
- Produces byproducts like hydrogen or alkalinity-enhancing compounds that can further aid carbon capture.

Direct Ocean Capture:

- Extracting CO₂ directly from seawater using engineered systems.
- Concentrated CO₂ can be stored geologically or repurposed industrially.

Advantages of mCDR:

Massive Potential for Carbon Removal:

- The ocean's vast surface area and volume offer unparalleled capacity for CO₂ absorption.
- Co-benefits for Marine Ecosystems:
- Some methods, such as macroalgae cultivation, enhance biodiversity and provide sustainable aquaculture opportunities.
- Climate Change Mitigation:
- Reduces greenhouse gas concentrations, contributing to global temperature stabilization.

Ratapani forest:

The Madhya Pradesh government has notified **Ratapani forest in Raisen district** as a tiger reserve in the state.

About the Ratapani Forest Reserve :

- It is located in the Indian state of **Madhya Pradesh**, is a significant ecological and biodiversity hotspot. Known for its rich flora and fauna, the forest is a vital part of India's central ecosystem and contributes to the preservation of endangered species and forest-based livelihoods.

Location and Area:

- Situated in the Raisen and **Sehore districts of Madhya Pradesh**.
- Spans an area of approximately 823 square kilometers.
- Falls under the **Vindhya Hills range** and is part of the central Indian landscape.

Ecological Significance:

- Recognized for its dense teak and mixed forests.
- Supports numerous water bodies, streams, and hills, making it an ecologically diverse region.
- Vital for regulating regional climate and maintaining biodiversity

Coastal Erosion in India: A Growing Crisis

Why in News ? A recent Lok Sabha session highlighted that **33.6% of India's coastline** is under threat from erosion, emphasizing the need for robust coastal management.

India's Coastline:

- Spanning over **7,500 km**, India's coast includes **9 states**, **2 UTs**, and **66 coastal districts**.
- Coastal morphology: **43% sandy beaches**, **11% rocky coasts**, **36% muddy flats**, **10% marshy areas**, **97 estuaries**, and **34 lagoons**.

Extent of Erosion:

- **33.6% of the coastline** faces erosion, while **26.9% shows accretion**, and **39.6% remains stable** (NCCR data).

State-wise highlights:

Karnataka: 48.4% of Dakshina Kannada's coastline eroded.

West Bengal: 60.5% erosion, especially in the Sundarbans.

Kerala: 46.4% of the coastline eroded.

Tamil Nadu: 42.7% of the coastline affected.

Causes of Coastal Erosion:

Natural Factors:

- Wave action, sea-level rise, storm surges, and cyclones.

Anthropogenic Factors:

- Coastal development, illegal sand mining, and deforestation of mangroves.

Impacts:

- **Loss of land** affecting agriculture and housing.
- **Displacement** of communities, causing socio-economic challenges.
- **Infrastructure damage** to roads, bridges, and buildings.
- **Biodiversity loss** in mangroves, coral reefs, and wetlands.

*Mitigation Measures:***Policy Initiatives:**

- **Integrated Coastal Zone Management Project (ICZMP)** in Gujarat, Odisha, and West Bengal.
- **Coastal Regulation Zone (CRZ) Notification (2019)** with no-development zones (NDZ).
- **Coastal Vulnerability Index (CVI)** and multi-hazard vulnerability maps by INCOIS.

Innovative Engineering:

- **Artificial reefs**, eco-friendly breakwaters, and **geo-tube installations** (e.g., Odisha's Pentha village).

Ecosystem-Based Solutions:

- **Mangrove plantations** and shelterbelt vegetation to stabilize coastlines.
- **Community and Awareness:**
- Community-driven conservation and **education campaigns** on coastal ecosystem importance.

Conclusion:

- Addressing coastal erosion requires a **multi-faceted approach** combining **scientific research**, **community involvement**, and **sustainable development** to safeguard India's coastal ecosystems and livelihoods.

Sugamya Bharat Abhiyan: Achievements

Why in News? The completions of 9 years of Sugamya Bharat Abhiyan was recently highlighted in major news papers.

The article highlights **Sugamya Bharat Abhiyan (Accessible India Campaign)** as a transformative initiative launched to create an inclusive environment for persons with disabilities (PwDs) in India. It reflects on its achievements over the past nine years and its transition into the broader **Scheme for Implementation of the Rights of Persons with Disabilities Act (SIPDA)**, emphasizing accessibility as an ongoing national priority.

Key Points:**Background:**

- India's prior efforts to ensure accessibility for PwDs were unstructured.

- The **Sugamya Bharat Abhiyan**, launched in 2015, aimed to address gaps in the Persons with Disabilities Act, 1995, by setting enforceable standards.



Achievements:

Infrastructure: Retrofitting over 1,700 government buildings and auditing accessibility in 1,671 others.

Transportation: Improvements in airports, railway stations, buses, and bus stations with accessibility features.

Digital Accessibility: Making 95 Central Government and **676 State Government** websites accessible.

Education & Media: Establishing the Indian Sign Language Research and Training Centre (ISLRTC) and promoting accessible TV content.

Awareness: Launching the Sugamya Bharat App for reporting accessibility issues and initiating curriculum development in technical education.

Ongoing Efforts:

- Sector-specific accessibility guidelines for various sectors.
- Training programs for access auditors and web developers.
- Accessibility initiatives for pilgrimage sites and universal accessibility workshops.

Financial Commitment:

- Significant budget increases for PwD empowerment, with ₹1,143.89 crore spent in 2023-24, reflecting sustained government focus.

Way Forward:

- The campaign's integration into SIPDA ensures continued progress toward a fully accessible society.

- Emphasis on innovation, stakeholder collaboration, and sustained funding to empower PwDs.

Conclusion:

The **Sugamya Bharat Abhiyan** has laid a robust foundation for accessibility and inclusivity, ensuring dignity and independence for PwDs. Its achievements and integration into broader schemes demonstrate the government's commitment to creating an equitable society.

World Wildlife Conservation Day:

Why in News? World Wildlife Conservation Day (December 4) serves as an occasion to not only celebrate the country's rich biodiversity but also evaluate if enough is being done to protect the critically endangered species that find a home here.

India's Rich Biodiversity and Global Significance**Biodiversity Statistics:**

- India covers only 2.4% of the world's land area but accounts for 7-8% of recorded species.
- Hosts **45,000 plant species** and **91,000 animal species**, contributing to its classification as a **megadiverse country**.

Biogeographic Zones and Hotspots:

- India has **10 biogeographic zones** and is home to four of the 34 globally recognized biodiversity hotspots:
 1. The Himalayas
 2. Indo-Burma
 3. Western Ghats-Sri Lanka
 4. Sundaland

The Challenge of Coexistence**Conflict with Development:**

- India's growing population and economic trajectory demand natural resources like land, timber, coal, and forest produce, leading to habitat destruction.

Cultural Reverence for Wildlife:

- Indian mythology and traditions often hold wildlife in high regard.
- Unlike Africa's fenced reserves, Indian wildlife reserves are open, and hunting is banned as a recreational activity.

Critically Endangered Species:

- As of 2022, India has **73 critically endangered species** (an increase from 47 in 2011).
- The rise reflects both species decline and better data monitoring by the **Ministry of Environment, Forests, and Climate Change**.

Endemic Mammals:

- Of nine critically endangered mammal species, eight are endemic, restricted to specific areas:
- **Examples:** Kashmir stag (Hangul), **Malabar large-spotted civet**, **Andaman shrew**, Nicobar shrew, Namdapha flying squirrel.

Limited Attention to Other Species:**Tourism Focus on Big Cats:**

- Lions, tigers, and cheetahs attract significant attention due to their tourism appeal but represent only a fraction of critically endangered species.

Neglected Birds:

- Species like the **Great Indian Bustard** face threats (e.g., powerlines in Rajasthan) but receive insufficient conservation focus.

Conclusion:

While India's cultural and natural heritage fosters wildlife conservation, economic growth and habitat conflicts pose significant challenges. The rising number of critically endangered species underlines the urgency of enhancing conservation efforts and public awareness

Extrachromosomal DNA (ecDNA):

Recent studies show that ecDNA is present in nearly **40% of cancer cell lines and up to 90% of brain tumour samples**.

It contributes significantly to cancer progression and drug resistance by amplifying oncogenes (cancer-causing genes).

What is ecDNA?

- Extrachromosomal DNA (ecDNA) is a small fragment of genetic material found outside the main chromosomes.
- Once dismissed as insignificant, ecDNA is now recognized as crucial to understanding cancer biology.

Lake-Effect Snow:

Why in News ? The season's first major snowfall hit parts of **New York, Pennsylvania, and Michigan** during the busy holiday travel and shopping weekend. Cold temperatures and heavy snow are expected to continue into the week, creating hazards in the **Great Lakes, Plains, and Midwest regions**.

The Nature of Lake-Effect Snow: Fluffy and Light

- Lake-effect snow is characterized by its low water content, making it light, fluffy, and capable of piling up quickly.
- The snow-to-water ratio in lake-effect snow can reach 40:1, compared to the typical 10:1 ratio in standard snowfalls.

Formation of Lake-Effect Snow:

- Forms when cold, dry arctic air passes over the warmer, unfrozen waters of large lakes like the **Great Lakes**.
- **Warmth and moisture** from the lake rise, creating narrow bands of snow-producing clouds.
- Wind direction plays a crucial role in determining which areas experience snowfall.
- **Snow Belts:** Where the Snow Hits Hardest
- **Regions 20+ miles inland**, often with hilly terrain, experience the heaviest snowfall due to additional lift.
- Snowfall is highly localized, with heavy snow in one area and clear skies just a few miles away.

Seasonal Timing of Lake-Effect Snow:

- Occurs mainly in fall and early winter before lakes freeze.
- Can continue into spring if the lakes remain unfrozen.

Record-Breaking Snowfalls:

- Western New York cities like **Buffalo, Syracuse, and Rochester** receive over 8 feet of snow annually.
- **Montague, NY**, holds an unofficial record for 6.5 feet of snow in 24 hours (January 1997).
- Extreme events like 5 inches of snow in 20 minutes and thundersnow are notable phenomena.

Beyond the Great Lakes: Other Locations:

- Lake-effect snow is not exclusive to the **Great Lakes**; it occurs near other large bodies of water, such as **Utah's Great Salt Lake**.
- **Local Attitudes Towards Lake-Effect Snow:**
- Residents in snow-prone areas like **Syracuse embrace** the heavy snowfalls, considering them preferable to other natural disasters like **hurricanes or floods**.
- This structure provides a clear and concise summary of the **article's main points**.

Friendshoring and Reshoring:

Why in News? Recently these terms were used in an article .

What is Friendshoring?

- Friendshoring refers to the practice of relocating supply chains and manufacturing operations to countries that are politically and economically aligned with the home country, often to reduce risks associated with geopolitical tensions and ensure stable trade relationships.

Key Features:

- Focuses on trusted trade partners or allies.
- Aims to mitigate risks like sanctions, **trade restrictions, or political instability**.
- Prioritizes secure and resilient supply chains over pure cost advantages.
- Examples include the U.S. encouraging supply chain shifts to allied nations like India, **Vietnam, or Mexico**, particularly for critical goods like semiconductors and pharmaceuticals.

Advantages:

- Enhances economic security by relying on stable allies.
- Reduces over-dependence on single or adversarial nations, e.g., China.
- Aligns trade with strategic geopolitical goals.

Reshoring:

- Reshoring involves bringing back manufacturing and supply chains to the home country from overseas. It focuses on reducing reliance on foreign production and boosting domestic capabilities.

Foreign Currency Non-Resident (Banking) FCNR(B) :

Why in News ? The Reserve Bank of India (RBI) has **raised the interest rate ceilings on Foreign Currency Non-Resident (Banking) FCNR(B)** deposits to attract more foreign currency inflows. FCNR(B) deposits are foreign currency term **deposits that Non-Resident Indians (NRIs)** can open with Indian banks.

Key Details:

Revised Interest Rate Ceilings:

- For deposits of **1 year to less than 3 years maturity**:
- Interest rates can now go up to **Overnight Alternative Reference Rate (ARR) + 400 basis points (bps)**.
- Earlier, the ceiling was **ARR + 250 bps**.
- For deposits of **3 to 5 years maturity**:

- Interest rates can now go up to **ARR + 500 bps**, compared to **ARR + 350 bps** earlier.

What are Foreign Currency Non-Resident (Banking) [FCNR(B)] deposits?

- They are special bank accounts offered by Indian banks to Non-Resident Indians (NRIs) and Persons of Indian Origin (PIOs).
- These accounts are maintained in foreign currencies, allowing NRIs to park their overseas earnings in India without the risk of currency fluctuation on the principal or interest.

Key Features of FCNR(B) Deposits:

Currency Options:

- Accounts are maintained in major foreign currencies like USD, GBP, EUR, JPY, AUD, CAD, etc.

Tenure:

- Minimum tenure: **1 year**.
- Maximum tenure: **5 years**.

Interest Rates:

- Banks offer interest rates based on global benchmarks like **LIBOR** or the new **Alternative Reference Rates (ARRs)**.

Repatriation:

- Both the **principal and interest are fully repatriable** (can be transferred back to the NRI's country of residence).

Tax Benefits:

- Interest earned is exempt from Indian income tax.
- **No wealth tax or gift tax** on these deposits.
- Risk-Free Returns:
- Since the deposits are maintained in foreign currency, they protect **NRIs from currency exchange risks**.

World Drought Atlas 2024 :

Why in News? The World Drought Atlas, jointly developed by the UNCCD and European Commission JRC, provides an in-depth view of the systemic nature of drought risks. It uses maps, infographics, and case studies to depict the cascading effects of droughts across sectors like energy, agriculture, transport, and public health.

Key Points:

Urgency of Global Action on Drought Resilience:

- Droughts have risen by 29% since 2000 due to climate change and mismanagement of natural resources.
- By 2050, three in four people globally could be affected by droughts, emphasizing the need for immediate action to mitigate risks.

Sectoral Impacts and Interconnectivity:

Energy: Hydropower reductions during droughts lead to higher energy prices and power outages.

Agriculture: Accounting for 70% of freshwater usage, agriculture is severely affected, further exacerbating food insecurity.

Waterways and Trade: Drought-induced low water levels disrupt transport, as seen in cases like the Panama Canal.

Ecosystems: Biodiversity loss amplifies drought risks, while greater biodiversity can enhance resilience.

Human-Made Droughts and Virtual Water Transfers:

- Human activities, such as overuse of water resources, exacerbate droughts.
- The concept of virtual water transfers illustrates how agricultural exports from water-stressed regions intensify local drought impacts.

Case Studies from Global Regions:

The Atlas highlights lessons from drought-prone areas, including:

Great Plains, USA: Insights into large-scale drought impacts on agriculture and energy.

Barcelona, Spain: Challenges in urban drought management.

Yangtze River Basin, China: Impacts on water security and biodiversity.

Indian Subcontinent and Horn of Africa: Socio-economic consequences and the plight of marginalized communities.

Measures to Build Drought Resilience:

The Atlas proposes actionable steps for managing and adapting to drought risks:

Governance: Early warning systems, microinsurance, and water-pricing reforms.

Land Management: Agroforestry, reforestation, and land restoration initiatives.

Water Management: Wastewater reuse, groundwater recharge, and conservation technologies.

Role of International Collaboration:

- The **Resilience International Drought Alliance (IDRA)** and other global networks are pivotal in sharing knowledge and implementing best practices.
- **Collaboration among 197 UNCCD member states at Riyadh** underscores the collective effort required to tackle droughts at all levels.

Call to Action for Proactive Drought Management:

- The Atlas serves as a rallying point for governments, businesses, and policymakers:
- Encourages nations to integrate drought resilience into policy and governance.

- Highlights the co-benefits of proactive measures for ecosystems, economies, and public health.

Pathway to UNCCD COP16:

The publication aims to build momentum for decisive action at the upcoming UNCCD COP16 in Riyadh. It emphasizes turning scientific knowledge into policy and actionable strategies to ensure a drought-resilient future.

The Secured Overnight Rupee Rate (SORR):

What is SORR?

- The Secured Overnight Rupee Rate (SORR) is a new benchmark rate proposed by the Reserve Bank of India (RBI) for the interest rate derivatives market. It is based on transactions in the secured money market, which includes:

Overnight Repo Market: Transactions where financial institutions borrow funds against securities as collateral for one day.

TREPS (Tri-party Repo): A repo mechanism involving three parties—borrower, lender, and a tri-party agent—to facilitate secured transactions in government securities or other approved securities.

Key Features of SORR:

Secured Transactions Basis: Unlike unsecured benchmarks, SORR reflects rates derived from collateralized money market transactions, enhancing reliability and reducing risk of manipulation.

Development of Interest Rate Derivatives Market: By using SORR as a benchmark, the RBI aims to support more transparent and efficient pricing in derivatives markets.

Credibility of Benchmarks: The **introduction of SORR** is part of the RBI's efforts to strengthen benchmark governance and reduce reliance on unsecured rate benchmarks.

Overnight Alternative Reference Rate (ARR)

What is the Overnight Alternative Reference Rate (ARR)?

- It is a modern benchmark interest rate used in financial markets to determine the cost of borrowing or lending in overnight transactions.
- It replaces older benchmarks like **LIBOR (London Interbank Offered Rate)** and is part of global reforms aimed at improving transparency and reliability in financial benchmarks.

Key Features of Overnight ARR:**Transaction-Based:**

ARR is calculated based on actual market transactions, making it more reliable than older benchmarks like **LIBOR, which relied on estimates**.

Overnight Basis:

- It reflects the cost of borrowing or lending funds for one day in secured or unsecured money markets.

Examples of ARRs:

SOFR (Secured Overnight Financing Rate): Used in USD markets, based on secured repo transactions in the U.S. Treasury market.

SONIA (Sterling Overnight Index Average): Used in GBP markets, based on unsecured overnight lending.

ESTR (Euro Short-Term Rate): Used in EUR markets, based on unsecured wholesale **euro borrowing**.

TONAR (Tokyo Overnight Average Rate): Used in JPY markets, based on unsecured overnight call **money market transactions**.

International Drought Resilience Alliance (IDRA)

About the International Drought Resilience Alliance (IDRA) :

- It is a global coalition launched in **November 2022 during the 27th UN Climate Change Conference (COP27)** to address the growing challenges of droughts worldwide.
- It aims to **accelerate actions and build resilience against the increasing frequency and intensity of droughts**, exacerbated by climate change and unsustainable land and water management.

Founding and Leadership:

- IDRA was co-chaired by **Spain and Senegal** during its inception.
- It aligns closely with the goals of the UN Convention to Combat Desertification (UNCCD).

UK Joins CPTPP:

Why in News? The UK has officially become a member of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), joining 11 existing members including Australia, Japan and Canada.

About CPTPP:

- The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a major free trade agreement among countries in the Asia-Pacific region. It evolved from the original Trans-Pacific Partnership (TPP) after the United States withdrew in 2017. The CPTPP came into effect on December 30, 2018.

Member Countries:

CPTPP currently includes 11 member countries:

- Australia
- Brunei
- Canada
- Chile
- Japan
- Malaysia
- Mexico
- New Zealand
- Peru
- Singapore
- Vietnam
- Together, these countries represent **13.4% of the global economy** and have a combined GDP of over **\$13.5 trillion**.

Goals of CPTPP:

Promote Trade: Reduce tariffs and trade barriers.

Economic Integration: Enhance economic cooperation among member nations.

Market Access: Expand access for goods, services, and investments.

Standards: Promote common standards on labor rights, intellectual property, environmental protection, and e-commerce.

Significance of the CPTPP:

Trade Impact: Eliminates 95% of tariffs between member countries.

Economic Influence: Strengthens global supply chains and enhances trade across the Pacific.

Regional Balance: Provides an alternative to China's growing economic influence in the region.

India and the CPTPP:

- **India is not** a member of the CPTPP.
- However, India's participation in similar agreements like RCEP (Regional Comprehensive Economic Partnership) has been debated, given its strategic position in the Asia-Pacific.

Cyclone Chido impact on Mayotte:

Why in News? The cyclone caused significant devastation on the Indian Ocean island of Mayotte, triggering chaos and fear. The situation is extremely precarious.

- Mayotte, located at the **northern edge of the Indian Ocean's cyclone zone**, had largely avoided the worst cyclones in recent years.

Indian Ocean's Cyclone Zone:

- The Indian Ocean Cyclone Zone refers to the region around the Indian Ocean where tropical cyclones, or hurricanes, are most commonly formed.
- The zone includes the eastern **coast of Africa**, the **islands in the Indian Ocean**, the **Arabian Peninsula**, and parts of **South and Southeast Asia**.
- Cyclones in this region typically form during the cyclone seasons, which vary based on the geography:

Northern Indian Ocean: Cyclones generally occur between April and December, with the peak season being between May and November.

Southern Indian Ocean: Cyclones typically form from November to April.

- These storms are powerful weather systems that can cause severe damage, including flooding, strong winds, and loss of life.
- Regions like **Mayotte, Madagascar**, and parts of India and **Sri Lanka** are particularly vulnerable to the impact of these cyclones.

About the Red Cross and Red Crescent Societies (IFRC):

- The International Federation of **Red Cross and Red Crescent Societies (IFRC)** is the world's largest humanitarian network, composed of **192 National Societies**, including the **Indian Red Cross Society and the French Red Cross**.

Key Facts about IFRC:

Mission: The IFRC provides humanitarian assistance, focusing on the most vulnerable communities affected by emergencies, health crises, and natural disasters, and works towards long-term development and building resilience.

Disaster Management: In emergencies like Cyclone **Chido in Mayotte**, the IFRC plays a critical role by coordinating with local and international stakeholders, providing resources, medical teams, and logistical support to affected areas.

Health and Community Services: Beyond disaster relief, IFRC focuses on improving public health, with initiatives around preventing diseases, improving sanitation, and ensuring access to medical care in underserved regions.

International Collaboration: The IFRC works closely with other humanitarian organizations such as the United Nations, local governments, and other aid organizations to coordinate efficient and effective disaster relief.

Sacred groves

Why in News? The Supreme Court of India has recently directed the Union government to make a comprehensive policy for managing sacred groves across the country.

About Sacred groves:

- They are **small patches of forests or natural vegetation** that are protected by local communities due to religious or cultural beliefs.
- These areas are considered sacred and often dedicated to local deities, spirits, or ancestral figures.
- They play a **crucial role in conserving biodiversity**, preserving traditional ecological knowledge, and maintaining cultural heritage.

Key Features of Sacred Groves:

Ecological Importance:

- Act as reservoirs of biodiversity, housing rare and endangered species of flora and fauna.
- Serve as carbon sinks, aiding in climate regulation.
- Protect soil and water resources.

Cultural and Religious Significance:

- Associated with local deities, spirits, or religious rituals.
- Often act as sites for community gatherings and festivals.

Traditional Conservation Practices:

- Protected through unwritten community rules or taboos.
- Activities like hunting, logging, or agriculture are prohibited or restricted.

The waste water management

Why in News? The **Waste to Worth: Managing India's Urban Water Crisis** through Wastewater Reuse report, released by the Centre for Science and Environment (CSE) and the National Mission for Clean Ganga (NMCG), explores how treated wastewater can be reused to mitigate water scarcity in urban areas.

72% of wastewater remaining untreated, which exacerbates the country's growing water crisis.

Key Points from the Report:

Current Water Crisis and Wastewater Reuse:

- India's urban areas face significant water shortages due to rapid urbanization, industrial growth, population expansion, and climate change. Reusing treated wastewater could play a vital role in easing these water shortages by supporting agriculture, industrial processes, and urban greening projects.
- Presently, **only 28% of the 72,000 million liters** of wastewater generated daily in India is treated, with the rest polluting rivers, lakes, and soil. Treating and reusing wastewater could close this gap and provide a sustainable water source.

Wastewater Treatment and Reuse Mandates:

- The Ministry of Jal Shakti mandates that cities recycle at least **20% of the water** they consume, but scaling up the treatment infrastructure is necessary to meet this goal.
- The report suggests that wastewater reuse is crucial for achieving water security by promoting "**water circularity**" (recycling water in multiple uses).

Regional Disparities and Progressive Policies:

- **Uttar Pradesh** leads in untreated wastewater volumes, followed by Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Delhi, and Haryana. However, some states have adopted progressive policies to encourage wastewater reuse.
- **Maharashtra** mandates industries in urban areas to use treated wastewater, while **Gujarat** has set a target for 100% wastewater reuse in agriculture and industry. Tamil Nadu focuses on using treated wastewater for industrial processes and urban greening.
- Cities like **Nagpur, Bengaluru, and Chennai** are successful examples of wastewater reuse in action. For example:
- **Nagpur uses treated wastewater** in power plants to reduce freshwater use.

- **Bengaluru** uses treated wastewater for agriculture, lake rejuvenation, and groundwater recharge.
- **Chennai** uses it in industrial processes, urban landscaping, and groundwater replenishment.

Challenges in Scaling Up Wastewater Reuse:

- Despite the clear benefits, several challenges remain in upscaling wastewater reuse:
- Public resistance due to cultural beliefs and safety concerns about using treated wastewater.
- Infrastructure gaps, especially in sewage treatment and distribution.
- High operational costs of wastewater treatment facilities.
- Quality assurance to ensure that treated water meets standards for safe reuse.
- The report stresses the need for **decentralized and cost-effective** treatment technologies to address these gaps.

Circular Economy and Policy Alignment:

- The report advocates for a circular economy approach to water management, where treated wastewater is integrated into national programs like **Jal Jeevan Mission, Atal Bhujal Yojana, and AMRUT** (Atal Mission for Rejuvenation and Urban Transformation). This would help build a more climate-resilient water management framework.
- The idea is to treat wastewater as a valuable resource rather than a waste product, which can contribute significantly to water security in India.

Call for Action:

- The report presents a blueprint for policymakers to prioritize wastewater reuse as a public good, ensuring equitable access, especially for underserved communities.
- Community engagement, innovative policies, and robust infrastructure investment are critical to overcoming challenges and implementing effective wastewater reuse practices.
- Public-private partnerships and capacity-building initiatives are essential for promoting wider adoption.

ISRO's SpaDeX Mission:

Why in News? PSLV C60/SPADEX Mission is scheduled on 30th December 2024 at 21:58 hrs IST from SDSC SHAR, Sriharikota.

About the mission:

- The SpaDeX (Space Docking Experiment) Mission is a pioneering technology demonstrator launched by the Indian Space Research Organisation (ISRO).
- It aims to develop and showcase in-space docking technology using two small spacecraft. This capability is vital for India's advanced space exploration goals, including human spaceflight, lunar sample return missions, and establishing the **Bharatiya Antariksh Station (BAS)**.

What is docking?

- Docking is the precise process of connecting two spacecraft, either manned or unmanned, so they can operate as a single unit.

Why is docking important?

- Docking is essential for future space operations, such as human spaceflight, lunar sample return missions, and the construction of large space structures.

How does docking work?

- Docking involves a series of steps, including soft capture, load attenuation, and hard docking.

What will SPADEX achieve?

- SPADEX will help India become the fourth country in the world to have space docking technology. It will also be a critical milestone for the development of the **Bharatiya Antariksh Station (BAS)** and other advanced space endeavors.

What is Rendezvous?

- **Rendezvous refers** to the process of two spacecraft meeting in orbit and positioning themselves within close proximity for docking.
- It is achieved through careful calculations of orbital mechanics, propulsion adjustments, and precise navigation.

GenCast

Why in News? The term was recently in news.

What is GenCast?

- GenCast is a new AI-based ensemble weather forecasting model that advances the prediction of weather uncertainties and risks.
- It is a high-resolution (0.25°) model designed to provide more accurate and reliable weather forecasts, particularly up to 15 days in advance.

- It is considered a significant improvement over traditional weather forecasting models, such as the **European Centre for Medium-Range Weather Forecasts' (ECMWF) ENS.**

Key Features of GenCast:

- **Ensemble Forecasting:** Unlike traditional models that provide a single weather forecast, GenCast generates a range of likely weather scenarios (ensemble forecasting).
- This provides decision-makers with a clearer understanding of the potential variability in future weather conditions, helping them make more informed decisions.

AI and Diffusion Models:

- GenCast utilizes a diffusion AI model, a type of generative AI that has recently advanced in fields like image, video, and music generation.
- However, GenCast is adapted specifically to the spherical geometry of the Earth and is designed to generate probability distributions of weather scenarios based on current weather conditions. This allows it to predict future weather patterns with greater accuracy, especially for extreme events.

Shringverpur Dham & Akshayvat corridors

Why in News ? The Prime Minister has recently inaugurated major temple corridors which include Bharadwaj Ashram corridor, Shringverpur Dham corridor, Akshayvat corridor, Hanuman Mandir corridor among others. These projects will ensure ease of access to devotees and also boost spiritual tourism.

Bharadwaj Ashram Corridor (Prayagraj):

Significance: Bharadwaj Ashram is associated with the sage Bharadwaj, who is believed to have hosted Lord Rama, Sita, and Lakshman during their exile.

Shringverpur Dham Corridor (Prayagraj):

Significance: Shringverpur is believed to be the place where Lord Rama crossed the Ganga River with the help of **Nishadraj, a tribal king.**

Akshayvat Corridor (Prayagraj):

Significance: Akshayvat, or the "Indestructible Banyan Tree," is considered sacred and has historical significance in Hindu mythology. It is located inside the **Allahabad Fort.**

Hanuman Mandir Corridor (Prayagraj):

Significance: Hanuman Mandir houses a reclining idol of Lord Hanuman and is a major pilgrimage site.

The Smuggling in India report 2023-24:

Why in News? The Smuggling in India 2024 report by the Directorate of Revenue Intelligence (DRI) highlights evolving narcotics hubs and trafficking routes affecting India.

Key Points from the Report:

India's Strategic Location:

- India's geographic position makes it a major hub for drug trafficking, with borders connecting narcotics-producing regions, and a vast coastline providing numerous entry points.

Methamphetamine Seizures:

- Increased seizures of methamphetamine in states like Assam and Mizoram, with 123 kg confiscated in 2024 during April-September.

Major Narcotics Hubs and Trafficking Routes:

The Death Crescent:

Region: Afghanistan, Iran, Pakistan.

Trafficking Routes:

- Through **African and Gulf regions**.
- Traditional routes like the **India-Pakistan border and maritime** routes.
- Maritime Routes:

Challenges: India's long coastline offers opportunities for smuggling via sea.

Methods: Drugs are often concealed in shipping containers or fishing vessels.

Concern: Difficult to track and control illicit shipments due to the volume of maritime traffic.

The Death Triangle:

Region: Myanmar, Laos, Thailand.

Significance: Major source of synthetic drugs and heroin.

Trafficking Routes:

- Drugs enter India through the northeastern states.
- The porous borders and difficult terrain of states like Manipur, Mizoram, and Nagaland make trafficking easier.
- Smuggling occurs through remote forest areas and rivers along the Indo-Myanmar border.

Key vulnerable areas: Moreh and Churachandpur (Manipur) and Zokhawthar (Mizoram).

Air Routes:

Significance: Air routes have become a significant method for smuggling due to faster transportation and increased international air traffic.

Methods:

- Drugs are often hidden in luggage, courier packages, or ingested by carriers (**known as "mules"**).

About the Directorate of Revenue Intelligence (DRI):

The **Directorate of Revenue Intelligence (DRI)** is a premier agency under the **Department of Revenue**, Ministry of Finance, Government of India, tasked with investigating and combating **smuggling** and **customs-related offenses**, particularly focusing on the enforcement of economic laws.

Powers:

- The DRI is headed by a **Director General (DG)**, who is an officer of the **Indian Revenue Service (Customs)**, typically at the rank of **Additional Secretary** to the Government of India.
- The **Director General** of DRI is appointed by the **Union Government** under the Ministry of Finance.
- The appointment is made by the **Department of Revenue**, which comes under the **Ministry of Finance**.
- The head of the DRI is typically a senior officer from the **Indian Revenue Service (IRS)**, with experience in customs and revenue-related matters.
- As an agency under the **Ministry of Finance**, DRI directly reports to the **Secretary (Revenue)** in the ministry.

What is Disease X?

Why in news? The recent outbreak reported in the first week of December 2024 in the Democratic Republic of Congo, which has claimed over **400 lives and remains unclassified**, has raised concerns that it could be an **instance of Disease X**.

What is Disease X?

- Disease X is a hypothetical term introduced by the World Health Organization (WHO) in 2018 to represent an unknown pathogen that could cause a devastating epidemic or pandemic.
- **It is not a specific disease** but a concept emphasizing the potential emergence of a novel, unpredictable pathogen with severe global health implications. The goal of the concept is to **prompt proactive planning and preparedness for such scenarios**.

Coastline-Waders Bird Census'

Why in News? The country's first-ever 'Coastline-Waders Bird Census' was began recently at **Marine National Park and Sanctuary in Jamnagar**, Gujarat.

The three-day census which has been jointly organized by the Department of Forest and the **Bird Conservation Society** will also host significant events focusing on counting wader and coastal bird species.

About Waders:

- Waders, also known as shorebirds or wading birds, are a diverse group of birds that are typically found in coastal or wetland habitats.
- They are **adapted to feed on the mudflats**, sandy shores, and shallow waters of beaches, **estuaries, and wetlands**. These birds have long legs, long bills, and are known for their ability to forage in water and mud for invertebrates like worms, mollusks, crustaceans, and other small prey.

Key Characteristics of Waders:

Long Legs: Waders have long legs that allow them to wade through shallow waters or mudflats in search of food.

Long Bills: Their bills are often specialized for probing into the mud or sand to find food. Some species have straight bills, while others may have curved or spatula-shaped bills.

Adaptation to Aquatic Habitats: These birds are often found in wetland ecosystems, including coastal areas, freshwater lakes, marshes, and mudflats.

Migratory Behavior: Many waders are migratory, traveling long distances between their breeding grounds in northern regions and wintering grounds in the south.

Examples of Wader Birds:

Sandpipers (family Scolopacidae)

Plovers (family Charadriidae)

Godwits (family Scolopacidae)

Curlews (family Scolopacidae)

Stilts (family Recurvirostridae)

Avocets (family Recurvirostridae)

Hérons (family Ardeidae) – though some herons are more commonly known for their standing posture rather than wading actively.

Waders play an important role in their ecosystems by helping to control populations of invertebrates and acting as indicators of environmental health. They are often used in birdwatching and are an important subject of study for ornithologists and ecologists.

About the Bird Conservation Society of India (BCSI):

- The Bird Conservation Society of India (BCSI) is a prominent non-governmental organization that focuses on the conservation of bird species and their habitats in India. It works to raise awareness, engage in research, and take direct conservation actions to protect both migratory and resident bird populations.

Powers and Membership:

Membership: The Bird Conservation Society of India has a diverse membership base, including birdwatchers, nature lovers, researchers, students, and conservationists. Members can engage in birdwatching, contribute to research efforts, and participate in the society's conservation programs.

Membership Benefits: Members often get access to resources, newsletters, and updates on conservation efforts. They also have opportunities to participate in bird watching events, research projects, and campaigns organized by the society.

Role of Members: Members are encouraged to contribute to bird monitoring and conservation efforts. This can include reporting sightings of rare or threatened species, participating in surveys and fieldwork, and helping to raise awareness in their communities.

Work Under:

- The Bird Conservation Society of India works under **the framework of national and international wildlife conservation laws and policies.**
- They collaborate with other wildlife organizations, government bodies like the Ministry of Environment, Forest and Climate Change (MoEFCC), and global conservation networks such as **BirdLife International**. Additionally, BCSI works with local communities to promote sustainable practices that do not harm bird habitats and help in community-based conservation efforts.

First Generation Beta (Gen Beta)

Why in News? India welcomed its first Generation Beta baby, Frankie Remruatdika Zadeng, on January 1, 2025, in Aizawl, Mizoram.

First Generation Beta (Gen Beta) - Overview and History:

Gen Beta (Born 2025-2039):

- Children born between **2025 and 2039** are designated as **Generation Beta (Gen Beta)**. This cohort will grow up in a world that is heavily shaped by technological advancements, environmental challenges, and societal shifts.
- As per futurist **Mark McCrindle**, who coined the term, Gen Beta will be the first generation to be fully immersed in an increasingly digital and automated world.

Who Coined the Term Gen Beta?

- The term **Gen Beta** was coined by **Mark McCrindle**, a well-known Australian futurist and demographer, in his blog. McCrindle has been instrumental in the study of generational trends and has provided in-depth insights into how different generations are shaped by the socio-economic environment they are born into.
- In his explanation, McCrindle notes that the **last generational shift occurred in 2010** with the birth of **Gen Alpha**, which will conclude in **2024**. He specifically chose the labels "Alpha" and "Beta" for the two most recent generations to signify not just a continuation of the alphabet, but to **reflect a shift in the world's progression**. These names signal a departure from traditional generational naming and emphasize that these generations will be defined by technological, environmental, and social changes far more distinct from previous cohorts.

Why "Alpha" and "Beta" for These Generations?

- McCrindle's reasoning behind naming the last two generations "Alpha" and "Beta" is profound. Instead of following the typical sequential naming (e.g., Baby Boomers, Generation X, Millennials), he chose these names to underscore that **Generations Alpha and Beta will be defined by fundamental changes** in the way they experience the world. For Gen Alpha, it signifies growing up in a **hyper-connected, technologically driven society**, while Gen Beta is expected to face challenges and opportunities shaped by **advanced AI, automation, environmental shifts**, and possibly a more **globalized world**.

Generational Timeline and Characteristics:

Generation Z (Gen Z):

Born: 1997-2012

Defining Characteristics: Digital natives, socially conscious, and highly connected. They grew up during the rise of social media, smartphones, and globalized connectivity.

Major Influences: The internet, social media, environmental concerns, and movements for equality and justice.

Generation Alpha (Gen Alpha):

Born: 2010-2024 (currently, the oldest members of Gen Alpha are teens)

Defining Characteristics: The first generation to be born entirely in the 21st century, surrounded by the most advanced digital technologies, with a greater emphasis on AI, robotics, and virtual reality.

Major Influences: Artificial intelligence, automation, smart devices, and augmented reality.

Generation Beta (Gen Beta):

Born: 2025-2039 (projected):

Defining Characteristics: Children of Gen Beta are expected to grow up in a world dominated by **artificial intelligence**, **sustainability issues**, and **biotechnologies**. Climate change, social justice movements, and an emphasis on **global citizenship** are likely to shape their worldview.

Major Influences: Deep technological integration, sustainable living, AI, automation, and a more complex global socio-political landscape.

Projected Impact of Gen Beta:

- **Technological Integration:** Gen Beta is expected to experience an even greater integration of technology in daily life. By the time they are adults, technologies like **AI**, **augmented reality**, **biotechnology**, and even **quantum computing** will likely be a standard part of life.
- **Environmental Challenges:** With growing environmental concerns, Gen Beta will have to navigate a world increasingly affected by **climate change**, **resource scarcity**, and the shift toward **sustainability**.
- **Economic Shifts:** Automation, driven by AI and robotics, will redefine the nature of work, potentially leading to new economic models such as **universal basic income** and **gig economy** trends.
- **Social Movements:** Social justice and global movements, especially related to climate change, gender equality, and racial justice, will likely shape their values and behaviors.

Conclusion:

Gen Beta, like **Gen Alpha** before them, will be shaped by a rapidly changing world, with technological innovations, environmental crises, and shifting socio-political dynamics influencing their experiences. As the **first cohort of the post-2024 era**, they are set to face both unprecedented challenges and opportunities, with technology and sustainability at the forefront of their lives.

Export Inspection Council (EIC):

Why in News? Recently, the EIC initiated a **gap assessment study** to evaluate the food testing infrastructure for exports, identifying any shortcomings in facilities and processes that may impact the quality assurance of exported goods.

About EIC:

- The **Export Inspection Council (EIC)** is a statutory body set up by the **Government of India** under the **Export (Quality Control and Inspection) Act, 1963**. Its core mandate is to ensure that products exported from India meet the quality and safety standards required by importing countries.

Purpose and Establishment:

- The EIC was created to promote the sound development of India's export trade by ensuring the quality control and inspection of products destined for international markets. It operates as the official certification body for exported goods, with a specific focus on food safety and quality standards.

Structure and Leadership:

- The **Chairman** heads the EIC, overseeing its overall functioning.
- The **Director of Inspection & Quality Control** serves as the Executive Head, responsible for managing day-to-day operations.
- The headquarters of the EIC is located in **Delhi**, with a network of **Export Inspection Agencies (EIAs)** in **Mumbai, Kolkata, Kochi, Delhi, and Chennai**, as well as 30 sub-offices spread across India.
- EIC's activities are backed by **state-of-the-art laboratories**, accredited by the **National Accreditation Board for Testing and Calibration Laboratories (NABL)**.

Key Functions and Responsibilities:

Quality Control and Certification:

1. The EIC's primary role is to ensure that products listed under the **Export (Quality Control and Inspection) Act, 1963**, comply with the safety and quality standards required by the importing countries.
2. It provides mandatory certification for various food products, including:
 - **Fish and fishery products**
 - **Dairy products**
 - **Honey**
 - **Egg products**

- Meat and meat products
- Poultry meat products
- Animal casings
- Gelatin, ossein, crushed bones
- Feed additives and pre-mixtures
- Certification for other food and non-food items is provided on a **voluntary basis**.

Gap Assessment Study:

- Recently, the EIC initiated a **gap assessment study** to evaluate the food testing infrastructure for exports, identifying any shortcomings in facilities and processes that may impact the quality assurance of exported goods.

International Standards Compliance:

- The EIC ensures that India's export products meet the international requirements of quality and safety, ensuring that Indian goods can enter global markets without facing rejection due to non-compliance with foreign regulations.

Role of EIC in India's Export Industry:

- The Export Inspection Council plays a pivotal role in the growth of India's export trade by maintaining high standards for products, particularly in the food sector. This, in turn, enhances India's reputation as a reliable exporter while safeguarding consumer safety abroad.

Collaboration with Other Entities:

- The EIC collaborates with various government bodies and **export promotion organizations** to streamline export procedures and support the certification process. It also works with international regulatory bodies to align India's export products with global standards.

Conclusion:

The **Export Inspection Council (EIC)** is crucial for India's export ecosystem, ensuring that exported goods, especially food items, are of the highest quality and comply with international regulations. With its comprehensive network and expertise in quality control, the EIC is helping maintain India's competitive edge in global trade while fostering consumer trust in Indian products worldwide.

The Global Risks Report 2025:

Why in News? The **Global Risks Report 2025**, released by the World Economic Forum, identifies and analyzes the most pressing global risks for the short term (1-2 years) and long term (10 years), offering insights into the interconnected challenges facing the world.

- The report is based on the **Global Risks Perception Survey (GRPS)** and emphasizes the need for global collaboration to address these issues effectively.

Categorization of Risks:

- The report categorizes risks into short-term and long-term based on their projected impacts and likelihoods:

Short-Term Risks (1-2 Years):

- **Misinformation and Disinformation:** Rapidly spreading false narratives threaten social cohesion and democracy.
- **Extreme Weather Events:** Increasingly frequent and severe events such as hurricanes, floods, and heatwaves impact human lives and infrastructure.
- **State-Based Armed Conflicts:** Heightened geopolitical tensions and conflicts challenge global stability.

Long-Term Risks (10 Years):

- **Extreme Weather Events:** Persistent and escalating events due to climate change.
- **Biodiversity Loss and Ecosystem Collapse:** Irreversible damage to ecosystems threatens food security, livelihoods, and global biodiversity.
- **Critical Earth System Changes:** Large-scale disruptions in earth systems, including oceans, forests, and the cryosphere, have far-reaching consequences for humanity.

Four Key Spheres of Risk:

The report highlights **four critical spheres shaping global risks** that are expected to intensify:

Technological Risks:

- Cybersecurity threats, data breaches, and misuse of emerging technologies such as artificial intelligence and quantum computing.
- Concerns about digital inequality and technology monopolies.

Geostrategic Risks:

- Heightened tensions between major powers.
- Rising instances of economic protectionism and weaponization of resources.

Climatic Risks:

- Increasing greenhouse gas emissions leading to climate instability.
- Focus on short-lived climate pollutants like **black carbon**, **methane**, and **hydrofluorocarbons** to mitigate climate change impacts.

Demographic Risks:

- Aging populations in developed nations and a youth bulge in developing countries.
- Challenges in managing migration and labor force participation.

Focus on Climate Action:

The report underscores the urgent need for collective climate action:

- **Short-Lived Climate Pollutants (SLCPs):** Addressing pollutants such as **black carbon**, **methane**, and **hydrofluorocarbons** can yield quick benefits for climate and public health.
- **Transition to Renewable Energy:** Accelerating investment in renewable energy to reduce dependency on fossil fuels.
- **Nature-Based Solutions:** Restoring ecosystems to build resilience against climate-related risks.

Impacts of Biodiversity and Ecosystem Collapse:

- **Food Security:** Loss of biodiversity threatens agricultural productivity and resilience.
- **Economic Costs:** Ecosystem degradation leads to reduced natural capital and affects industries reliant on natural resources.
- **Health Impacts:** Biodiversity loss increases the risk of zoonotic diseases.

Technological Innovation and Risks:

- **Emerging Technologies:** Rapid innovation in AI, biotechnology, and quantum computing raises ethical and governance concerns.
- **Cybersecurity Threats:** The proliferation of cyberattacks and ransomware disrupts economies and critical infrastructure.
- **Digital Divide:** Unequal access to technology exacerbates global inequalities.

Geopolitical Fragmentation:

- **Economic Protectionism:** Trade barriers and economic sanctions lead to global supply chain disruptions.
- **Resource Weaponization:** Control of critical resources like rare earth elements and energy is increasingly used as leverage in international relations.
- **Global Governance Challenges:** Fragmented governance undermines collaborative efforts to address transnational risks.

Recommendations for Risk Mitigation:

- **Global Cooperation:** Strengthening multilateral frameworks to address shared challenges.
- **Investing in Resilience:** Building infrastructure and systems resilient to climate and technological shocks.
- **Public-Private Partnerships:** Mobilizing resources and expertise from both public and private sectors.

- **Data-Driven Decision Making:** Using data analytics to predict and mitigate risks effectively.

Conclusion:

The **Global Risks Report 2025** highlights the complex interplay of technological, geostrategic, climatic, and demographic factors shaping the future. The report emphasizes the importance of proactive measures and collaborative efforts to mitigate these risks, ensuring a sustainable and resilient global future.

The Diamond Imprest Authorization (DIA) Scheme:

Why in News? Department of Commerce, Government of India has introduced the **Diamond Imprest Authorization (DIA) Scheme** recently, aiming to enhance the global competitiveness of India's diamond sector. This scheme provides a streamlined mechanism for duty free import of **Natural Cut and Polished Diamonds**, and there by promoting value addition and boosting exports. The Scheme will be implemented with effect from 01.04.2025.

Key Features of the Scheme:

- This scheme allows the duty-free import of **Natural Cut and Polished Diamonds, of less than ¼ Carat (25 Cents)**.
- **This scheme mandates export obligation** with a value addition of 10%.
- All Diamond exporters holding Two Star Export House status and above and having US \$15 Million exports per year, are eligible for availing the benefit under this scheme.
- The scheme is made in response to Beneficiation policies undertaken in a number of natural diamond mining countries like **Botswana, Namibia Angola** etc where Diamond manufactures are obliged to open cut and polishing facilities for a minimum percentage of value addition. This scheme is aimed towards retaining India's position as a global leader in the entire value **chain of Diamond industry**.

Level Playing Field for MSME Exporters:

- Supports small and medium Indian diamond exporters to compete with larger players globally.

Investment Retention:

- Aims to prevent the shift of Indian investments to diamond-mining nations.

Employment Generation:

- Creates jobs for **diamond sorters** and workers in semi-finished diamond processing units.
- Focuses on skilled craftsmen to strengthen the domestic diamond industry.

Boost to Exports:

- Expected to increase the export of **Cut and Polished Diamonds** from India.

Support for Domestic Industry:

- Protects the domestic diamond processing sector and sustains related employment.

Compliance and Ease of Business:

- Reinforces India's position in the global diamond trade by ensuring adherence to international standards while simplifying operations.

Addressing Industry Challenges:

- Designed to combat declining exports and job losses, rejuvenating the diamond industry.

About Natural Cut and Polished Diamonds:

- Natural cut and polished diamonds are diamonds that have undergone cutting and polishing after being extracted from mines as rough diamonds. The process involves:

Cutting: Shaping the diamond to enhance its brilliance and maximize its value.

Polishing: Smoothing the diamond's facets for better reflection and shine.

- These diamonds are in high demand for jewelry and industrial purposes. India, particularly Surat in Gujarat, is a global hub for diamond cutting and polishing, handling over 90% of the world's supply.

Top 3 States in India for Diamond Processing

India is not a major producer of natural diamonds, but it leads globally in diamond cutting and polishing. The states dominating this industry are:

Gujarat:

- Surat is known as the "**Diamond City of India.**"
- It processes a majority of the world's diamonds.

Maharashtra:

- Mumbai serves as a trading hub for diamonds.
- Houses major diamond trading centers like the Bharat Diamond Bourse.

Rajasthan:

- Jaipur is known for its expertise in colored gemstones and diamond cutting.
- While diamond mining is limited in India, states like Madhya Pradesh (Panna region) have natural diamond reserves.

Global Export of Diamonds by India:

- India is the largest exporter of cut and polished diamonds.
- Key facts include:
- **Export Value:** India exports cut and polished diamonds worth billions of dollars annually, making it a major contributor to the country's foreign exchange.

Major Markets:

USA: The largest buyer of Indian diamonds.

Hong Kong: A significant market for Indian diamonds.

UAE (Dubai): A critical trading partner for diamond exports.

Global Diamond Industry Leaders:

Top Producing Countries for Rough Diamonds:

Russia: Largest producer of rough diamonds (Alrosa).

Botswana: Significant diamond mining through De Beers.

Canada: Known for its high-quality rough diamonds.

India's Contribution:

- India dominates the global diamond cutting and polishing market but imports most rough diamonds from mining countries like **Russia, Botswana, and Canada**.

What is Security Transaction Tax (STT)

Why in news? The Security transaction tax (STT) has recently jumped to **75 %** despite market volatility.

What is Security Transaction Tax (STT)?

Security Transaction Tax (STT) is a tax levied on the transaction of securities that are traded on Indian stock exchanges. It was introduced by the Indian government in the **Finance Act of 2004**, and the tax is aimed at providing an additional revenue stream to the government and simplifying the taxation of securities trading.

NITI Aayog's Fiscal Health Index (FHI) Report 2025

Why in News? NITI Aayog has published its first Fiscal Health Index (FHI) report.

Purpose: Assess the fiscal health of 18 major Indian States based on their contribution to GDP, demography, public expenditure, revenues, and fiscal stability.

- **Time Period Covered:** Rankings based on performance for FY 2022-23 and trends from 2014-15 to 2021-22.
- **Released By:** NITI Aayog, chaired by Arvind Panagariya (16th Finance Commission Chairman).

Top Performers:

Top State: Odisha with the highest index score of **67.8**.

Other Achievers: Chhattisgarh, Goa, Jharkhand (classified as "Achievers").

Characteristics:

Capital outlay: Up to 4% of GSDP.

Non-tax revenue mobilisation: Effective.

Revenue surplus: Consistently maintained.

Low interest payments: Up to 7% of revenue receipts.

Front-Runners:

- **States:** Maharashtra, Uttar Pradesh, Telangana, Madhya Pradesh, Karnataka.

Characteristics:

- **Developmental expenditure:** High, up to 73%.
- **Own tax revenue:** Witnessed consistent growth.
- **Debt sustainability:** Improved, with a **debt-to-GSDP ratio** of 24%.
- **Fiscal management:** Balanced.

Worst Performers (Aspirational States):

- **States:** Punjab, Andhra Pradesh, West Bengal, Kerala.
- **Challenges:**
 - **Fiscal deficit targets:** Not being met.
 - **Revenue mobilisation:** Low.
 - **Debt burden:** Growing.
 - **Debt sustainability:** A major concern.

Detailed Analysis of Odisha:

- **Debt Index Score:** 99.0 (highest).
- **Debt Sustainability Score:** 64.0.
- **Strengths:**
 - Maintains low fiscal deficits.
 - Good debt profile.
 - High **capital outlay-to-GSDP ratio**.

Key Challenges for Poor Performers:

- **Kerala and Punjab:** Low quality of expenditure and poor debt sustainability.
- **West Bengal:** Struggles with revenue mobilisation and debt index issues.
- **Andhra Pradesh:** High fiscal deficit.
- **Haryana:** Poor debt profile.

Historical Performance (2014-15 to 2021-22):

- Top Average FHI Scores: Odisha, Goa, Karnataka, Maharashtra, and Chhattisgarh.
- Data Source: Comptroller and Auditor General (CAG) reports.

Implications and Goals:

- **Objective:** Foster fiscal stability, improve expenditure quality, enhance revenue mobilisation, and ensure sustainable debt levels across Indian States.
- **Policy Recommendations:** Tailored fiscal reforms for underperforming States, focus on sustainable debt management, and revenue enhancements.

‘Election Integrity Index’

Why in News? The Chief Election Commissioner (CEC) has recently **Advocated for ‘Election Integrity Index’**.

Context:

- Chief Election Commissioner (CEC) Rajiv Kumar emphasized the need for election management bodies (EMBs) to develop an **Election Integrity Index**.
- Addressed concerns during the conclusion of a two-day international conference of EMBs hosted by the Election Commission of India (ECI) in New Delhi.

Concerns over Existing Democracy Indices:

Opacity in Parameters:

- Existing democracy indices lack transparency.
- Often rely on subjective interpretations rather than hard electoral facts.

Examples:

- Indices like **The Economist’s Democracy Index** and **V-Dem Institute’s Democracy Report** have flagged declines in India’s position.

Media and Social Media Bias:

- Rankings sometimes depend on **media reports** and **social media conversations**, ignoring ground realities.
- Such indices can discredit elections, especially when released during live election periods.

Proposed Election Integrity Index:

Parameters for Transparency:

Must focus on hard facts such as:

- Free voter registration.
- Unrestricted voter participation.
- Quality and integrity of electoral processes.

Purpose:

- To complement existing democracy indices or act as a sub-index.
- Ensure **pre-qualified weightage** for transparency and fairness in rankings.

*Challenges Faced by EMBs:***External Threats:**

- **Cyber interference** and **disinformation** are significant issues.
- Social media platforms, while democratizing information, often spread fake news.

Efforts by ECI:

- Focused on countering fake content during the **2024 Lok Sabha elections**.
- Advocated for “**anti-pollution measures**” for social media, including algorithm-based detection of misinformation.

*Call for Objectivity in Democracy Indices:***Past comments by CEC:**

- **2022 Mexico Conference:** Suggested including the **local context** of countries in indices.
- **South Africa A-WEB Meeting:** Highlighted the need to **revisit assessment parameters** used by international organizations.

Association of World Election Bodies (A-WEB):

The Association of World Election Bodies (A-WEB) is the largest international platform of Election Management Bodies (EMBs), established to foster cooperation, strengthen electoral processes, and promote democracy worldwide.

Founded: October 14, 2013.

Headquarters: Incheon, **South Korea**.

Members: Over 100 EMBs from various countries.

Objective:

- Enhance collaboration among EMBs.
- Share best practices, knowledge, and expertise related to electoral management.
- Promote free, fair, transparent, and credible elections.

India & A-WEB:

- A founding member of A-WEB.
- Hosted A-WEB's General Assembly meeting in Bengaluru, India, in 2019.

Fiscal Responsibility Legislation (FRL):

Why in news ? the terms was recently used in an article that discusses about fiscal condition of Delhi Government & challenges.

What is Fiscal Responsibility Legislation (FRL)?

- The Fiscal Responsibility Legislation (FRL) is a set of laws aimed at ensuring that government borrowing and deficits are kept within sustainable limits. It is meant to promote fiscal discipline, ensuring that the government does not borrow excessively or incur deficits beyond certain thresholds. The FRL for India at the central level mandates that the Fiscal Deficit should not exceed 3% of GDP.

Example:

- Under the FRL, a state's GFD-GSDP ratio should ideally not exceed 3% to ensure fiscal discipline. If a state's GFD exceeds 3% of its GSDP, it may need to take corrective measures, such as cutting down on expenditures or increasing revenue, to bring the deficit back in line with the FRL limits.

FRL Limit of 3%:

- The FRL limit of 3% means that the Gross Fiscal Deficit (GFD) should not exceed 3% of GSDP. This is a target set to maintain fiscal stability and prevent excessive government borrowing, which could lead to **higher inflation or debt servicing costs**.

What is Chhava Controversy?

The trailer of the Bollywood film *Chhava*, based on the life of Chhatrapati Sambhaji Maharaj, has sparked controversy in Maharashtra.

- The film, featuring actor Vicky Kaushal as Sambhaji Maharaj, includes a scene where he performs the lezim folk dance alongside actress Rashmika Mandanna, playing Maharani Yesubai.
- This portrayal has faced criticism, prompting the film's director, Laxman Utekar, to announce the deletion of the scene after meeting with Maharashtra Navnirman Sena (MNS) chief Raj Thackeray.

What is the Controversy About?

- Chhatrapati Sambhajiraje, a descendant of Sambhaji Maharaj, raised objections to the film's portrayal of the king and questioned the liberties taken by the filmmakers. Maharashtra Minister Uday Samant also expressed concern, suggesting the film be reviewed by experts before release.

Lezim Dance and Its Cultural Significance :

- The lezim dance, often performed during marriage processions and festivals like **Ganesh Chaturthi**, has become a staple in physical education in Maharashtra.

- It involves rhythmic movements and the clashing of mallets, accompanied by a dhol. The film's inclusion of this dance was seen as a cultural reference but became contentious due to its portrayal in the context of a revered historical figure.

About Chhatrapati Sambhaji Maharaj Chhatrapati Sambhaji Maharaj, son of Shivaji Maharaj, ascended the throne after a bloody succession battle in 1681. He successfully defended Maratha forts against Mughal forces but was captured in 1689 and executed by the Mughal emperor Aurangzeb.

DeepSeek-V3 and DeepSeek-R1:

Why in News? The stock market experienced a significant dip, with the tech-heavy Nasdaq dropping 3%, its worst performance in two years. This drop was attributed to the rise of the Chinese AI startup, DeepSeek, which recently unveiled its AI models — DeepSeek-V3 and DeepSeek-R1. These models quickly gained global attention, surpassing ChatGPT as the most downloaded app on the App Store, challenging OpenAI's frontier models.

What is DeepSeek?

- DeepSeek is a Chinese AI company based in Hangzhou, founded by Liang Wenfeng, also the CEO of the quantitative hedge fund High Flyer.
- The company started working on AI in 2019, and its controlling shareholder, Wenfeng, also owns patents related to chip clusters used for training AI models.
- What sets DeepSeek apart is its open-sourced AI models, which allow anyone to build upon them, with the DeepSeek-V3 trained on just \$5 million, far less than the hundreds of millions invested by other companies.

Unique Features of DeepSeek AI Models:

- DeepSeek has been pitted against US AI giant OpenAI due to its optimal use of resources. DeepSeek-V3, the first model launched, surpassed GPT-4o and Claude 3.5 Sonnet in multiple benchmarks.
- It uses Mixture-of-Experts (MOE) architecture, where specialized models work together rather than a single large model. Trained on 14.8 trillion tokens, DeepSeek-V3 uses a new technique, **Multi-Head Latent Attention (MLA)**, to enhance efficiency and reduce training and deployment costs.
- **DeepSeek's new model, DeepSeek-R1**, boasts the ability to "think" during tasks, allowing users to see the **model's thought process**.
- R1 matches or surpasses OpenAI's frontier model in areas like math, coding, and general knowledge, while being **90-95% more affordable than OpenAI-o1**. The open-

source nature of R1 raises questions about the necessity of massive expenditures by other companies.

How DeepSeek Models are Cheaper than US Peers

- Training AI models is expensive, but DeepSeek significantly reduced costs by using NVIDIA H800 GPUs, a less advanced chip compared to the **NVIDIA H100 used by US** AI giants. Due to US restrictions on exporting advanced chips to China, DeepSeek utilized the NVIDIA H800, which had lower chip-to-chip bandwidth.
- The company optimized its code to overcome chip limitations and trained only necessary parts of its models using a technique called **Auxiliary-Loss-Free Load Balancing**, ensuring performance was not compromised despite limited resources.

What is Auxiliary-Loss-Free Load Balancing?

In systems like MoE, multiple "experts" (sub-models) are trained simultaneously. A common problem is that certain experts might be overused while others remain underutilized. Traditional methods introduce **auxiliary loss functions** to force the model to use all experts equally, but these losses can interfere with the main task.

ALFLB avoids auxiliary losses by relying on smart routing and optimization techniques to:

1. Distribute tasks evenly across all experts.
2. Ensure that each expert contributes meaningfully to the training process.
3. Minimize computational waste without relying on artificial loss terms that may distort the main learning objective.

Pink Fire Retardant

Why in News ? Recent wildfires in Southern California have brought into light the use of pink fire retardant as authorities deploy aerial resources to combat the flames.

What is Pink Fire Retardant?

- Pink fire retardant is a chemical mixture used to control or slow the spread of wildfires. The most commonly used brand in the **United States is Phos-Chek**, which is mainly made up of **ammonium phosphate-based slurry**.
- This mixture contains salts like **ammonium polyphosphate**, which provides longer-lasting protection compared to water. The bright pink color is added for visibility, allowing firefighters to easily identify areas that have been treated.

How Does It Work?

- The retardant is sprayed ahead of the advancing flames to coat vegetation. This coating prevents oxygen from reaching the plants, effectively slowing the fire's spread.
- The method's effectiveness depends on factors such as terrain, type of vegetation, and weather conditions. Firefighters create fire lines around the treated areas to help contain the fire and enhance safety.

Environmental Concerns:

- There are growing concerns about the environmental impact of using aerial fire retardants.
- A study from the University of Southern California highlighted that **Phos-Chek contains toxic metals like chromium and cadmium**, which can pose serious health risks, including cancer and organ damage.
- These substances can also harm aquatic ecosystems if they enter waterways. The debate continues over whether the benefits of fire suppression outweigh the environmental risks associated with the use of fire retardants.

Interest Equalisation Scheme (IES):

Why in News ? The commerce ministry is likely to seek further extension of the interest equalisation scheme in the forthcoming Budget on pre- and post-shipment rupee export credit for another five years to promote the country's outbound shipments,

About the IES :

The **Interest Equalization Scheme (IES)** is a government initiative designed to make credit more affordable for certain sectors of the economy by subsidizing interest rates. The primary objective is to reduce the cost of financing for exporters, promoting India's exports and improving competitiveness in the global market.

- **Launched in 2015 by the Ministry of Commerce and Industry**, Government of India

Key Features of the Interest Equalization Scheme (IES):**Subsidy on Interest Rates:**

- The scheme provides an interest subsidy on export credit to exporters.
- This subsidy helps exporters access loans at a lower interest rate than the market rate, making their products more price-competitive internationally.

Targeted Sectors:

- The IES typically focuses on specific sectors such as **micro, small, and medium enterprises (MSMEs), handicrafts, agriculture, and other labor-intensive export industries.**

- These sectors may otherwise face higher financing costs, hindering their growth in global trade.

Objective:

- The scheme aims to **boost exports** and enhance India's **trade competitiveness**.
- It helps in **making Indian products more competitive** by reducing the financial burden on exporters.

Implementation:

- The IES is implemented by the **Reserve Bank of India (RBI)** in coordination with commercial banks.
- Exporters must meet specific eligibility criteria and apply through banks offering the scheme.

Scheme Duration:

- The scheme is typically introduced for a defined period, and the subsidy is provided on export credit loans.

Positive Impact:

- Encourages **export growth**.
- Provides **financial relief to exporters**, especially MSMEs, by reducing the burden of high interest rates on loans.
- Strengthens India's position in global markets by improving the competitiveness of Indian exports.

Example:

- If a sector is provided a 3% subsidy under IES and the market interest rate is 8%, the exporter would only pay 5% interest on the loan.

Fast-Track Immigration Trusted Traveller Program (FTI-TTP)

Why in News? The government is introducing a fast-track immigration programme for Indian nationals and Overseas Citizen of India (OCI) cardholders at seven major airports

Overview:

- A fast-track immigration programme launched by the **Union Home Ministry**.
- Aimed at **Indian nationals** and **Overseas Citizen of India (OCI) cardholders**.
- Part of the '**Viksit Bharat@2047**' vision, providing seamless and secure immigration services.
- **Union Home Minister Amit Shah** will inaugurate the programme.

Key Features:

- **Automated e-gates** to simplify immigration and reduce human intervention.
- **Gratis registration:** Free of cost for all eligible passengers in the initial phase.
- **One-time online registration:**
- Valid for **five years** or until the passport expires, whichever is earlier.

Eligibility:

- **Indian nationals** and **OCI cardholders**.
- Age criteria: **12–70 years**.
- **Children aged 12–18:** Can use their parents' or guardians' email addresses and phone numbers for registration.
- **Exclusions:**
- Holders of **ECR (Emigration Check Required) passports** are not eligible.

*How it Works:***Registration Process:**

- Travellers complete a one-time online enrolment.

At the Airport:

- Passengers scan their **boarding pass** and **passport** at the e-gate.
- The system verifies **biometrics automatically**.

Immigration Clearance:

- Upon successful authentication, the **e-gate opens**, granting clearance.

*Phased Implementation:***First Phase:**

- Covers **Indian nationals** and **OCI cardholders**.
- Airports: **New Delhi, Mumbai, Chennai, Kolkata, Bengaluru, Hyderabad, Cochin, Ahmedabad.**

Second Phase:

- To include **foreign travellers**.
- Total implementation across **21 major airports** in India.

Hydroclimate whiplash:

Why in News? The three wildfires that have devastated large parts of the Los Angeles city and surrounding areas in the United States since January 7, 2025, occurred due to rare meteorological conditions enhanced by global warming and consequent climate change, mainly due to a '**hydroclimate whiplash**'.

- The region affected by the fires was **5 degrees Celsius warmer, up to 15 per cent drier** and up to **20 per cent windier**, according to a study by climate attribution group ClimaMeter, published on January 9.
- Wind gusts of up to **161 kilometres per hour within** the seasonal Santa Ana winds and rare fire tornadoes have been observed within the fires.

What is Hydroclimate Whiplash?

Hydroclimate Whiplash refers to extreme and rapid shifts in the hydrological and climatic conditions within a region.

- It describes a situation where a region experiences abrupt transitions between opposing hydroclimatic states, such as from drought to intense flooding or from wet conditions to extreme dryness.
- These changes can happen over short timeframes, leading to significant challenges for water resource management, agriculture, infrastructure, and communities.
- In other words, hydroclimate whiplash involves severe and rapid changes in water availability or climate conditions that are inconsistent and difficult to predict, often resulting in negative impacts.

Examples of Hydroclimate Whiplash:

California (USA):

- California has experienced instances of hydroclimate whiplash, where it oscillates between prolonged droughts and intense flooding. For example, the state has faced several years of severe drought, followed by years of heavy rain and snowmelt, leading to flooding, landslides, and challenges in managing water resources.

Australia (2019-2020):

- Australia's "**Black Summer**" **bushfires in 2019-2020** were followed by heavy rainfall in some areas, leading to catastrophic flooding in the months after the fires. This rapid shift from extreme dryness and fire to sudden flooding is an example of hydroclimate whiplash, where one extreme event quickly gave way to another.

Sahel Region (Africa):

- The Sahel region of West Africa experiences cycles of drought and sudden heavy rainfall. In some years, the region faces severe water shortages and famine due to drought, while in other years, intense flooding occurs, damaging crops and

infrastructure. This transition between extreme wet and dry conditions is characteristic of hydroclimate whiplash.

Impacts of Hydroclimate Whiplash:

Agriculture: Crops may be destroyed by sudden floods or droughts, leading to food insecurity.

Water Supply: The rapid change in water availability can overwhelm existing water management systems.

Infrastructure: Infrastructure designed for either dry or wet conditions may fail when the conditions suddenly change.

Ecosystems: Species may struggle to adapt to rapid changes in water availability, affecting biodiversity.

The increasing frequency of such events is often attributed to climate change, as changing weather patterns become more erratic and unpredictable.

Grameen Bharat Mahotsav 2025

Why in News? Grameen Bharat Mahotsav 2025, inaugurated by Prime Minister Narendra Modi on 4th January, was held at Bharat Mandapam, New Delhi. The Mahotsav took place from 4th to 9th January and was themed "Building a Resilient Rural India for a Viksit Bharat 2047" with the motto "समृद्धि, रोजगार, न्याय, सुरक्षा".

The key points:

1. Celebration of Rural India's Entrepreneurial Spirit and Cultural Heritage:

- The Mahotsav aimed to celebrate the **entrepreneurial spirit** and **cultural heritage** of rural India.
- It brought together **rural entrepreneurs**, **artisans**, and **stakeholders** from diverse sectors to share ideas and create a roadmap for **rural transformation**.

2. Empowerment of Rural Women:

- One of the significant focuses was to **empower rural women through entrepreneurship**, encouraging their participation in economic activities and leadership roles.

3. Economic Stability and Financial Security:

- The event aimed to **promote economic stability** and **financial security** among rural populations, with special emphasis on **North-East India**.
- **Financial inclusion** and **sustainable agricultural practices** were key objectives to ensure long-term prosperity.

4. Enhancing Rural Infrastructure and Self-reliant Economies:

- Through **discussions, workshops, and masterclasses**, the Mahotsav sought to **enhance rural infrastructure** and create **self-reliant rural economies**.
- It emphasized **innovation** within rural communities, focusing on practical solutions to improve livelihoods.

5. Use of Technology and Innovative Practices:

- The event encouraged discussions around leveraging **technology** and **innovative practices** to **enhance rural livelihoods**, bringing modern solutions to traditional rural sectors.

6. Showcasing India's Rich Cultural Heritage:

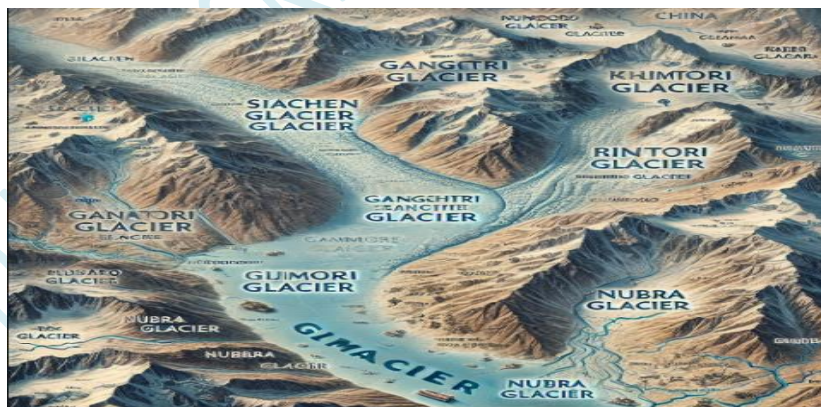
- Vibrant **performances** and **exhibitions** were organized to showcase India's **cultural heritage**, celebrating the diverse traditions and customs of rural regions.

This Mahotsav highlighted India's commitment to building a strong, resilient rural economy that contributes to the vision of a **Viksit Bharat by 2047**.

Thajiwas Glacier:

Why in News ? The Z-Morh tunnel is being built under the mountain glacier Thajiwas Glacier between **Gangangir and Sonamarg in Ganderbal district of Kashmir** ensuring all-weather connectivity to Sonamarg boosting tourism.

- The strategic location of the Sonamarg tunnel will help in bypassing the major avalanche zones of **NH-1 in the hung area** which will ensure the **safety of commuters**.



About Thajiwas Glacier:

- It is a prominent glacier located in the **Sonamarg region of the Kashmir Valley** in India. It is situated about 12 kilometers from the town of Sonamarg, which is a popular tourist destination.

- **Thajiwas Glacier** is part of the larger Himalayan Glacier System and is one of the main attractions in the area due to its scenic beauty and proximity to the Sonamarg valley.

Variable Rate Repo (VRR):

Why in news ? In a first, the Reserve Bank of India (RBI) has announced that it will conduct daily **variable rate repo (VRR)** auctions on all working days in Mumbai, until further notice.

- The liquidity deficit in the banking system has exceeded Rs **2 trillion** in the past few days.
- According to the latest data, the liquidity deficit in the banking system was Rs 2.09 trillion on Tuesday, while on Monday it was Rs **2.5 trillion**.

The **Variable Rate Repo (VRR)** is a monetary policy tool used by central banks, including the **Reserve Bank of India (RBI)**, to manage liquidity in the banking system and control short-term interest rates. It is a variant of the **repo rate**, with a key difference being that in VRR, the rate at which funds are borrowed is **not fixed**, but **variable**. Here's a breakdown of its key features:

Definition of Repo and VRR:

- A **repo (repurchase agreement)** is a financial transaction where the central bank provides funds to commercial banks or financial institutions against government securities as collateral. The bank agrees to repurchase these securities at a later date, typically at a higher price, which includes interest.
- In a **Variable Rate Repo (VRR)**, the interest rate (also known as the repo rate) is **not predetermined** but is instead determined through a **competitive bidding process**. The rate fluctuates based on the bids submitted by participating banks.

The 2024 State of Global Air (SoGA) Report:

Why in News? The 2024 State of Global Air (SoGA) Report highlights significant global health impacts due to air pollution, making it the second leading risk factor for death worldwide.

The 2024 State of Global Air (SoGA) Report is released by the Health Effects Institute (HEI), an independent U.S.-based non-profit research organization, in partnership with UNICEF.

Key findings:

- **Air Pollution as a Major Health Risk:** Air pollution accounted for 8.1 million deaths globally in 2021, trailing only high blood pressure as a leading cause of death.
- It is also the second leading risk factor for death among children under five, following malnutrition.

- Approximately 700,000 deaths in children under five were linked to air pollution, with 70% of these deaths occurring in Africa and Asia due to household air pollution from burning solid fuels for cooking (**State of Global Air**) (**Children's Enviro Health Collab**).
- 1. **Health Impacts:** Long-term exposure to air pollutants, including fine particulate matter (PM_{2.5}), ozone, and nitrogen dioxide (NO₂), has been associated with a variety of health issues such as heart disease, stroke, diabetes, lung cancer, and chronic obstructive pulmonary disease (COPD). For the first time, this year's report includes data on NO₂, primarily emitted from traffic exhaust, affecting densely populated urban areas, especially in high-income countries (**State of Global Air**) (IHME).
- 2. **Impact on Children:** Air pollution has significant effects on newborns and young children, contributing to premature birth, low birth weight, delayed brain development, asthma, lung diseases, and childhood cancers.
 - In 2021, air pollution was linked to 34% of preterm births globally. Preterm birth complications are a leading cause of death in children under five and can lead to lifelong disabilities and developmental delays (Children's Enviro Health Collab).
- 3. **Geographic Disparities:** The burden of air pollution is unevenly distributed, with South Asia and Africa experiencing the highest levels of exposure and associated health impacts.
 - For instance, household air pollution is particularly severe in these regions due to the prevalent use of solid fuels for cooking (IHME).
- 4. **Climate Change and Air Pollution:** The report underscores the bidirectional relationship between air pollution and climate change. Many sources of air pollution, such as the burning of fossil fuels, also contribute to greenhouse gas emissions, exacerbating global warming. This interconnection suggests that efforts to reduce air pollution can also have positive effects on mitigating climate change (Children's Enviro Health Collab).

These findings highlight the urgent need for global policies and interventions to reduce air pollution and its detrimental health effects, particularly for vulnerable populations such as young children. The report serves as a critical resource for understanding the scope of air pollution's impact on health and the environment worldwide.

The National Forensic Infrastructure Enhancement Scheme (NFIES):

Why in News? The National Forensic Infrastructure Enhancement Scheme (NFIES) is a significant initiative approved recently by the Indian Union Cabinet to strengthen the country's forensic science capabilities.

- The scheme will be operated by the Union Home Ministry.
- The scheme will be a central sector scheme (100% **financed by Central Government**) with a total outlay of Rs 2254.3 crores.
- The scheme will run from 2024-25 to 2028-29.

Objectives:

1. **Establishment of New Campuses and Laboratories:**
 - The scheme includes the creation of new campuses for the National Forensic Sciences University (NFSU) across India.
 - **New Central Forensic Science Laboratories (CFSLs)** will be established to meet the growing demand for forensic services.
2. **Enhancement of Existing Infrastructure:**
 - The infrastructure at the existing Delhi campus of NFSU will be upgraded to enhance its capacity and capabilities.

Functions:

1. **Addressing Manpower Shortages:**
 - The scheme focuses on training and deploying high-quality forensic professionals to address the current shortage in **forensic science laboratories (FSLs)** across the country.
2. **Improving Efficiency and Reducing Case Pendency:**
 - By expanding the forensic infrastructure, the scheme aims to reduce the backlog of cases awaiting forensic examination, thereby speeding up the criminal justice process.
3. **Supporting New Criminal Laws:**
 - The enactment of new criminal laws, which mandate forensic investigation for offences punishable by seven years or more, has significantly increased the workload of forensic laboratories. The NFIES is designed to support this increased demand and ensure timely forensic analysis.

Expected Outcomes:

- The NFIES aims to ensure a high conviction rate of over 90% by providing timely and scientifically robust forensic evidence.

- By establishing new forensic facilities and enhancing existing ones, the scheme seeks to create a more effective and efficient criminal justice system, leveraging advancements in technology to tackle evolving crime methods .

The World Investment Report 2024

Why in News? The World Investment Report 2024, published by UNCTAD, provides a comprehensive analysis of global and regional foreign direct investment (FDI) trends and their implications for sustainable development.

Key highlights:

1. Global FDI Trends:

- Global FDI flows declined by **2% in 2023, reaching \$1.3 trillion**. This downturn is attributed to ongoing global crises, trade tensions, and tighter financing conditions.
- FDI in developing countries fell more significantly, by **7%, totaling \$867 billion**.

Regional Highlights:

Latin America and the Caribbean: Investment was driven by demand for commodities and critical energy transition minerals, which accounted for **23% of project values** in the past two years.

Africa: Although **FDI flows to Africa** slightly declined, the continent saw significant investments in the clean energy sector, boosting sustainability efforts.

Developing Asia: This region experienced a substantial increase in greenfield investments, hosting **60% of the world's megaprojects**.

2. Sectoral Insights:

- Investments in sustainable development sectors saw a notable decline, with funding dropping by over 10%. This stagnation poses a challenge to achieving the Sustainable Development Goals (SDGs) by 2030.

3. Policy Developments:

- The report highlights the need for enhanced investment policies to address the adverse impacts of declining **FDI on sustainable development**. This includes measures to attract and retain FDI, particularly in sectors critical to the SDGs.