

## INDEX

### POLITY AND GOVERNANCE

- The farmers in Rajasthan has recommended the establishment of a farmers' cooperative-based distribution model with the regulatory viability under the Electricity Act 2003.
- Justice M S Sonak became the first person in Goa to registra "living will".
- Prime Minister Modi took oath along with 71 ministers of the new coalition government. Thirty of them are Cabinet Ministers, five independent charge, and 36 Ministers of State.
- Recently, the Madras High Court ruled that cooperative societies are not amenable to the Right to Information (RTI) Act of 2005.
- The ongoing spell of extreme heat in many parts of the country has once again reopened discussions on the inclusion of heatwaves as one of the notified disasters under the Disaster Management (DM) Act, 2005.
- The Telangana High Court has ruled against a taxpayer against whom the revenue department had invoked the General Anti-avoidance Rule (GAAR).
- The EU's recently passed EU AI Act, which will be rolled out in phases over the next two years, has ignited a battle over data transparency.
- President Murmu has rejected a mercy petition filed by Pakistani national Mohammed Arif who was sentenced to death for the December 22, 2000 terrorist attack at the Red Fort in which three people including two Army jawans were killed.
- SIM cards issuance
- Pro-Tem Speaker
- Recently, the Union government notified the Public Examinations (Prevention of Unfair Means) Bill, 2024, effective June 21, 2024.

- [What is Enemy Agents Ordinance of J&K?](#)
- [eSakshya App](#)
- [Ahead of the implementation of the new criminal laws, at least 23 modifications have been made to the Crime and Criminal Tracking Network Systems \(CCTNS\).](#)
- [Pharma Research in AyurGyan And Techno Innovation "PRAGATI- 2024".](#)
- [The Supreme Court recently observed that the extraordinary powers under Article 142 of the Constitution of India is an exception to the doctrine of merger and the rule of stare decisis to do complete justice between the parties.](#)

## DEFENCE AND SPACE

- [Rocket with a 3D- printed engine has been launched by space start-up Agnikul Cosmos Private Limited](#)
- [China's space agency said that China landed an uncrewed spacecraft on the far side of the moon on 2nd of June.](#)
- [The US recently conducted an unarmed Minuteman III intercontinental ballistic missile test from the Californian Vandenberg Space Force Base.](#)
- [The Space Agency ISRO recently announced a satellite mission, TRISHNA.](#)
- [ISRO's Reusable Launch Vehicle \(RLV\) Programme](#)
- [25<sup>th</sup> anniversary of Kargil war victory](#)
- [Nagastra - 1](#)
- [India's Nuclear Arsenal Grows](#)
- [LVM3 M3 re-enters Earth's atmosphere](#)
- [Exercise Tarang Shakti-2024](#)
- [Pushpak, ISRO's reusable launch vehicle, clears test](#)

- [The Space Variable Objects Monitor \(SVOM\)](#)
- [Recently, the Australian government has signed an \\$18-million memorandum of understanding \(MoU\) with the Indian Space Research Organisation's \(Isro's\)](#)
- [High Speed Expendable Aerial Target 'ABHYAS' successfully completes developmental trials.](#)

## INTERNATIONAL RELATIONS

- [India has become chair of the Colombo Process for the first time since its inception in 2003.](#)
- [Pakistan admitted in court that Pakistan-occupied Kashmir \(PoK\) is a "foreign territory".](#)
- [The inaugural United Nations Global Supply Chain Forum, organized by UN Trade and Development \(UNCTAD\) and the Government of Barbados, concluded successfully recently.](#)
- [The Indian delegation participated in the inaugural Indo-Pacific Economic Framework for Prosperity \(IPEF\) Clean Economy Investor Forum.](#)
- [India, South Korea, the United States, Japan, and the European Union \(EU\) have formed a Biopharmaceutical Alliance to address drug supply shortages during the COVID-19 pandemic.](#)
- [Pakistan, Somalia, Denmark, Greece and Panama were elected as non-permanent members of the UN Security Council for a two-year term beginning in 2025.](#)

- [At least 49 migrants died and 140 others were missing after their boat capsized off the coast of Yemen, the U.N. migration agency said on June 11.](#)
- [50th G7 Summit](#)
- [India refuses to endorse Ukraine meet statement](#)
- [Initiative on Critical and Emerging Technology](#)
- [India-Italy Strategic Partnership](#)
- [2nd meeting of India-Cambodia on Trade](#)
- [Russia and North Korea recently signed the “Treaty on Comprehensive Strategic Partnership”.](#)
- [International Criminal Court \(ICC\) issued arrest warrants for former Russian Defence Minister and current Chief of Staff of the Armed Forces for “alleged international crimes” linked to the Russia-Ukraine war.](#)
- [The Fourth International Conference on Small Island Developing States \(SIDS-4\) will be convened \(May 27-30\) in Antigua and Barbuda, North America.](#)

## **ECONOMY**

- [Reserve Bank Of India’s Variable Repo Rate auction sees huge response by banks suggesting an increased demand for liquidity in banking sector.](#)
- [Reserve Bank of India’s annual Report 2023-24 highlights India's stagnant millet acreage and production.](#)
- [As per the data by Department for Promotion of Industry and Internal Trade \(DPIIT\) FDI inflows in 2023-24 contracted by 3.49% to \\$44.42 billion compared to 2022-23.](#)
- [Second Advance Estimates of 2023-24 for Area and Production of Horticultural Crops](#)

- [Recently, SEBI introduced a framework on “financial disincentives” that targets market infrastructure institutions.](#)
- [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.](#)
- [Recently, the RBI proposed establishing a Digital Payments Intelligence Platform.](#)
- [The Central Board of Indirect Taxes and Customs \(CBIC\) recently started automatic electronic payment of duty drawback amounts directly into exporters’ bank accounts.](#)
- [India and the US informed the World Trade Organization \(WTO\) that they have reached a mutually agreed solution on the outstanding dispute.](#)
- [The Health Ministry and the IRDAI are working together to launch the National Health Claim Exchange \(NHCX\).](#)
- [An analysis by the Household Consumption Expenditure Survey \(HCES\) shows that consumption inequality in the rural areas of 11 states has increased.](#)
- [India’s Informal Sector Recovery](#)
- [Digital Agri Mission](#)
- [Corporate Social Responsibility \(CSR\)](#)
- [GST Council](#)
- [Krishi Sakhis](#)
- [Global Economic Decoupling](#)
- [Viability Gap Funding Scheme for Offshore Wind Energy](#)
- [Angel Tax](#)
- [Vadhavan Port](#)
- [RBI Cancels License of the City Co-operative Bank](#)
- [Revenue-Sharing Model](#)

- [National Monetisation Pipeline](#)
- [Container Port Performance Index](#)
- [Government imposes stock limits on tur, chana dal to curb hoardings.](#)
- [RBI has recently revised its incentive framework to push banks to increase the flow of priority sector credit to districts with lower credit flow.](#)
- [International Sugar Organisation](#)
- [Central Electronics Limited \(CEL\) has recently been awarded "Mini RATNA" status \(Category-1\).](#)
- [RBI unveils revised Currency Swap Arrangement for SAARC countries.](#)
- [Recently, Capital markets regulator Sebi approved norms to regulate unregistered financial influencers, also referred as finfluencers.](#)
- [Recently, the Reserve Bank of India \(RBI\) has launched three major initiatives – PRAVAAH portal, the retail direct mobile app and a fintech repository.](#)

## ENVIRONMENT

- [60th meeting of the Subsidiary Bodies \(SB60\)](#)
- [A distinctive plant named \*Thismia malayana\*, which steals nutrients from underground fungi, has been published as a new species.](#)
- [The 2024 Environmental Performance Index \(EPI\) was released by the Yale Center for Environmental Law & Policy and the Center for International Earth Science Information Network \(CIESIN\).](#)
- [A rare four-horned antelope has been sighted for the first time in Veerangana Durgavati Tiger Reserve \(Sagar district\), which was earlier known as Nauradehi Sanctuary.](#)

- [Recently, three out of the six states where the Centre has proposed 'Eco-sensitive areas \(ESA\)' to safeguard the Western Ghats have requested a reduction in the size of these ESAs.](#)
- [A new study published in the journal Nature Climate Change reported a significant decrease in atmospheric hydrochlorofluorocarbons \(HCFCs\) five years before the target year.](#)
- [30 years of UN Land Convention](#)
- [Greater Adjutant Stork](#)
- [Bioluminescent Mushrooms](#)
- [Environmental Flows Monitoring System](#)
- [Direct Seeding of Rice \(DSR\)](#)
- [Bonn Climate Change Conference](#)
- [New Catalyst for cheaper biodiesel](#)
- [Sustainable Development Report, 2024](#)
- [Solid Waste Management \(SWM\) Cess](#)
- [Global Decline in DDT and Other POPs](#)
- [Blue Planet Prize](#)
- [New Species of Snake Eel Discovered in Odisha](#)
- [Limbless Amphibian Found in Kaziranga](#)
- [Environment Concerns in Great Nicobar Project](#)
- [State of Global Air Report 2024](#)
- [World Bank's Global Gas Flaring Tracker Report](#)
- [In recent times biomass briquettes are being used as a fuel alternative for the power and electricity generation sector.](#)
- [Recently, a Himalayan serow was spotted in the central part of Nameri National Park and Tiger Reserve.](#)

## GEOGRAPHY

- [PLEASE \(Plastic Free Rivers and Seas of South Asia\) program- A river cleanup campaign.](#)
- [Scientists recently unearthed living stromatolites—ancient geological structures made from algae—on Sheybarah Island, nestled on the northeastern shelf of the Red Sea in Saudi Arabia.](#)
- [Recently, 2 Human-made wetlands from Bihar, The Nagi and Nakti Bird Sanctuaries, have been recognised as wetlands of international importance under the Ramsar Convention.](#)
- [Pantanal Wetland](#)
- [ICIMOD, Report 2024 on Hindu-Kush Himalayan](#)
- [Olympus Mons](#)
- [Bayesian Convolutional Neural Network \(BCNN\)](#)
- [Alaknanda River](#)
- [Earth's Inner Core Rotation Slowing Down](#)
- [Sun Halo](#)
- [Ancient Greek sanctuary slowly sinks into the Aegean Sea.](#)
- [New research found that Australia's enigmatic pink sand- Garnet was born in Antarctic mountains.](#)
- [Barda Wildlife Sanctuary \(BWS\)](#)
- [Ganga Water Sharing Treaty](#)
- [South India's first and the country's largest leopard safari was recently inaugurated at the Bannerghatta Biological Park \(BBP\).](#)



## SCIENCE AND TECHNOLOGY

- The government of Jammu and Kashmir recently declared human rabies a notifiable disease under the Epidemic Diseases Act of 1897.
- Scientists at the Institute of Advanced Virology (IAV), Thiruvananthapuram, recently developed a novel way of generating non-infectious Nipah virus-like particles (VLPs) in the laboratory.
- Recently, ICAR has commercialised herbicide-tolerant (Ht) basmati rice varieties that can control weeds.
- NASA's James Webb Space Telescope (JWST) finds most distant known Galaxy JADES-GS-z14-0.
- Recent research has discovered a novel protein, referred to as "Neo," which plays a critical role in bacterial defence mechanisms against viral infections, particularly bacteriophages.
- Research on the Cassini spacecraft did not find a galactic anomaly of the kind predicted in the MOND theory.
- The use of Meropenem drug can cause adverse reactions as per The Indian Pharmacopoeia Commission (IPC).
- A team of scientists in the UK recently developed non-invasive measurement techniques and novel analysis methods to decode Huntington's disease.
- Enterobacter bugandensis in ISS
- Researchers at the Indian Institute of Science (IISc) have developed a new three-step process to remove heavy metal contaminants, such as arsenic, from groundwater.
- The FDA unanimously gave backing to Eli Lilly's Alzheimer's drug, Donanemab.

- Recently, International Fatty Liver Day 2024 was celebrated as in the month of June.
- Longitude Prize on Antimicrobial Resistance (AMR)
- Truenat Platform
- Streptococcal Toxic Shock Syndrome (STSS)
- Application of AlphaFold 3 in life sciences
- Nuclear study provides major update on plutonium isotope fission
- The Indian Army has recently launched a skin bank facility.
- Multi-Omics is an emerging technology in the field of clinical science in India.

## SOCIETY

- A recent analysis by The Lancet Public Health reveals that globally, men face a greater disease burden and tend to die prematurely compared to women.
- Recently, CSIR concluded the first phase of its longitudinal health monitoring project, Phenome India, and organised a special event, Phenome India Unboxing 1.0.
- Tele MANAS - A (MoU) was signed between the Ministry of Health and Family Welfare (MoHFW) and the Ministry of Defence (MoD).
- Recently, UNICEF released "Child Nutrition Report 2024"- titled as "Child Food Poverty: Nutrition deprivation in early childhood".
- CSIR- ASPIRE Scheme
- GREAT Scheme
- Digital Health Incentive Scheme

- [Kerala Migration Survey \(KMS\) 2023 report](#)
- [Tamil Nadu Seeks GI Tag for Seven Agricultural Products](#)
- [Pre-Incubation Entrepreneurship \(PIE\) development programme](#)
- [eMigrate Portal](#)
- [National Forensic Infrastructure Enhancement Scheme](#)
- [The World Health Organization \(WHO\) announced that Chad has successfully eradicated the gambiense form of human African trypanosomiasis \(HAT\).](#)
- [Srinagar recognised as 'World Craft City'](#)

## ART AND CULTURE

- [Recently, the Prime Minister of India, as part of his meditation exercise, performed 'Surya Arghya' during sunrise at the Vivekananda Rock Memorial.](#)
- [Bela block printing, a traditional craft from Bela village in Kutch, Gujarat, is in danger of disappearing.](#)
- [Kheer Bhawani Mela](#)
- [Raja Parb celebration](#)
- [Nalanda University](#)
- [Amaravathi: The rise and fall of one of the greatest Buddhist sites in India](#)

### FACTS FOR PRELIMS

- [The Jharkhand Governor and Chief Minister recently paid tribute to tribal icon Birsa Munda on his death anniversary.](#)
- [Traditional Medicine Research in India](#)
- [DRDO developed Woman-led start-up : Divya Drishti](#)
- [Train Accidents in India](#)
- [Juneteenth](#)
- [Kolar Gold Fields](#)
- [International Yoga Day - 21 June 2024](#)

## POLITY AND GOVERNANCE

The farmers in Rajasthan has recommended the establishment of a farmers' cooperative-based distribution model with the regulatory viability under the Electricity Act 2003.

- Recently, a dialogue on systemic issues of **poor electricity supply** faced by the farmers in Rajasthan has recommended the establishment of a farmers' **cooperative-based distribution model** with the regulatory viability under the Electricity Act 2003.
- The dialogue was organized by the Jaipur-based **Centre for Energy, Environment and People (CEEP)** as part of the '**Vidyut Samvad**' series here earlier this week.

### Cooperative Society:

- **Definition:** A cooperative society is a voluntary association of individuals with shared needs who come together to pursue common economic interests.
- **Objective:** The primary goal of any cooperative is to offer assistance to its members, particularly prioritizing the welfare of the underprivileged segments of society, through the principles of self-help and mutual aid.
- **Operational Approach:** By establishing cooperatives, individuals unite as a collective, combining their individual resources, optimizing their utilization, and deriving mutual benefits.
- In a cooperative society, individuals can join voluntarily and are also at liberty to exit, although they are unable to transfer their shares.

- **Types of Cooperatives in India:** Consumer Cooperative Societies, Producer Cooperative Societies, Cooperative Credit Societies, Cooperative Farming Societies, Housing Cooperative Societies, and Marketing Cooperative Societies.
- Among the 300 largest cooperative societies globally, **India's Amul, IFFCO, and KRIBHCO are featured.**

Steps taken to strengthen the cooperative movement in India:

- **Ministry of Cooperation:** Established with a distinct administrative, legal, and policy structure aimed at enhancing the cooperative movement.
- **The Banking Regulation (Amendment) Act, 2020:** Empowers the **RBI to replace the boards of Cooperative banks** and permits Cooperative banks to raise capital through public issues or private placements of equity or preference shares.
- **The National Agricultural Co-operative Marketing Federation (NAFED):** Aids Marketing Cooperatives in the States to enhance their marketing operations and improve services to their members.
- **The National Co-operative Development Corporation (NCDC):** Established in **1963**, it offers assistance in the form of loans and subsidies for marketing, processing, storage, and share capital practices in cooperative sugar, spinning, and weaving mills.
- **Cancellation of the 97th Constitutional Amendment Act, 2011 by the Supreme Court:** This amendment aimed to protect cooperatives by amending **Article 19(1)(c) and inserting Article 43B and Part IXB**. However, the Court ruled that Part IXB of the Constitution applies solely to **Multi-State cooperative societies** within states and Union Territories.

- **Part IXB of the Constitution** outlined regulations for operating cooperative societies.

**Electricity Act 2003:**

- The Electricity Act 2003, enacted by the Government of India, aims to restructure and reform the country's power sector.
- Key Provisions:
- **State Electricity Board dismantling:** Aimed to split SEBs into distinct generation, transmission, and distribution entities for competition and efficiency.
- **Delicensing of generation:** Removed generation licensing, encouraging private investment and diversification.
- **Transmission and distribution regulation:** Maintained licensing to ensure reliable supply and prevent monopolies.
- **Renewable energy promotion:** Mandated incentives and obligations for renewable energy generation.
- **Open access and trading:** Enabled consumer choice and transparent electricity trading.
- **Regulatory bodies establishment:** Established SERCs and CERC to regulate tariffs, compliance, and disputes.

**National Rural Electrification Policy:**

- National Rural Electrification Policy was notified in compliance with Sections 4 & 5 of the Electricity Act, 2003 by the Central Government.
- Relevant extracts of the National Rural Electrification Policy, 2006

- **Goals:** For villages/habitations where grid connectivity would not be feasible or not cost effective, off-grid solutions based on stand-alone systems may be taken up for supply of electricity
- State government should, within 6 months, prepare and notify a rural electrification plan which should map and detail the electrification delivery mechanism.
- The plan may be linked to and integrated with district development plans.

**Justice M S Sonak became the first person in Goa to register a "living will".**

Living Will:

- A living will, also known as an **Advance Medical Directive**, is a written document where an individual specifies their decisions regarding medical treatment in advance.
- It allows individuals to explicitly instruct on the medical treatments they wish to accept or refuse in the event they become unable to communicate their decisions due to incapacity.
- The document ensures that the person's wishes are respected when they are no longer competent to make decisions about their health care.
- The Supreme Court's judgment in the case of **Common Cause vs. Union of India & Anr. (2018)** supports the execution of living wills, recognizing the **right to passive euthanasia**. This involves withdrawing life support systems in cases where a person is in a persistent vegetative state.



- Living wills enable individuals, especially those diagnosed with terminal illnesses, to refuse specific medical treatments, thus allowing death to occur naturally and without unnecessary medical intervention.
- The execution of a living will is voluntary and can only be done by an adult who is of sound mind, highlighting the importance of personal autonomy in medical decision-making.

**Prime Minister Modi took oath along with 71 ministers of the new coalition government. Thirty of them are Cabinet Ministers, five independent charge, and 36 Ministers of State.**

Cabinet Committee on Security (CCS):

- It is **headed** by the Prime Minister.
- The Committee discusses, debates, and is the apex body when it comes to the appointments of the officials in the national security bodies.
- It also makes all the important decisions on **defence policy** and **expenditure** and, generally, all matters of India's security.
- **Members:** PM, Ministers of Defence, Home Affairs, Finance and External Affairs.
- **Functions:** Deals with all the issues related to the defence and security of India.
- The CCS deals with all issues related to the law and order and national security of India.

- It discusses different initiatives to take to enhance the national security of India.
- It also deals with policy matters of foreign affairs that may have a bearing on internal or external security implications, including cases relating to agreements with other countries on security-related issues.
- The Committee discusses the political issues which can impact the security of our nation.

Cabinet Committees:

- Cabinet Committees are **extra-constitutional**, meaning, they are **not mentioned in the Indian Constitution**.
- They are partly designed to reduce the burden on the **Union Cabinet** by allowing smaller groups of ministers to make decisions on specific policy areas.
- They are constituted or reconstituted when a new government takes over or the Cabinet undergoes a reshuffle.

There are a total of **8 cabinet committees**:

1. Cabinet Committee on Economic Affairs.
2. Cabinet Committee on Political Affairs.
3. Cabinet Committee on Investment and Growth.
4. Cabinet Committee on Security.
5. Cabinet Committee on Parliamentary Affairs.

6. Cabinet Committee on Employment and Skill Development.
7. Cabinet Committee on Accommodation.
8. Appointments Committee of the Cabinet.

**Recently, the Madras High Court ruled that cooperative societies are not amenable to the Right to Information (RTI) Act of 2005.**

The Madras High Court has set aside an order passed by Tamil Nadu Information Commission (TNIC) directing a cooperative society to disclose details regarding the loans extended by it.

- **Legal Rationale:** The court clarified that cooperative societies under the **Tamil Nadu Cooperative Societies Act of 1983** are **not 'public authority'** as per **Section 2(h) of the RTI Act of 2005**.

Cooperative Societies:

- **Formation:** Cooperatives are organizations formed at the grassroots level by people to harness the power of collective bargaining in the marketplace.
- This can mean different kinds of arrangements, such as using a common resource or sharing capital, to derive a common gain that would otherwise be difficult for an individual producer to get.
- Example: In agriculture, **cooperative dairies**, sugar mills, spinning mills etc. are formed with the pooled resources of farmers who wish to process their produce. **Amul from Gujarat** is perhaps the best-known cooperative society in India.
- **Jurisdiction:** Cooperatives are a **state subject** under the Constitution.

- The subject 'Cooperative Societies' is mentioned in **entry 32 of the State List** under the Seventh Schedule of the Constitution.

The Right to Information Act:

- **Right to Freedom of Speech & Expression:** It was passed by the Parliament in 2005 to enable the citizens to exercise their freedom of speech and expression under Article 19(1)(a) of Indian Constitution.
- **Mandate:** It provides the right to information for citizens to secure access to information under the control of public authorities in order to promote transparency and accountability in the working of every public authority.
- **Provision:** Under the provisions of the Act, a citizen may request information from a **"public authority" (a body of government)** which is required to reply within thirty days.
- However, there are many societies whose members and areas of operation are spread across more than one state. For example, most sugar mills along the districts on the Karnataka-Maharashtra border procure cane from both states.

Constitutional Provisions:

- The **97th Constitutional Amendment, Part IXB (The Co-Operative Societies)** was inserted into the Constitution.
- The Right to Form Cooperative Societies was included as **the Right to Freedom under Article 19 (1)**.
- **Article 43-B** that deals with Promotion of Cooperative Societies was also inserted as one of the Directive Principles of State Policy.
- In 2021, the **Ministry of Cooperation was created** by the Government of India for realizing the vision of **'Sahkar se Samridhi'**.

**The ongoing spell of extreme heat in many parts of the country has once again reopened discussions on the inclusion of heatwaves as one of the notified disasters under the Disaster Management (DM) Act, 2005.**

Notified Disasters:

- In India, the **Disaster Management Act, 2005**, defines a disaster as a "**catastrophe, mishap, calamity or grave occurrence**" arising from **natural or man-made** causes that results in substantial loss of life, destruction of property, or damage to the environment.
- The Act includes 12 categories of notified disasters, which are: Cyclone, Drought, Earthquake, Fire, Flood, Tsunami, Hailstorm, Landslide, Avalanche, Cloudburst, Pest attack, Frost and cold waves
- These notified disasters are eligible for relief assistance under the **State Disaster Response Fund (SDRF) and National Disaster Response Fund (NDRF)**.
- The SDRF is primarily used for immediate relief to victims of notified disasters, while the NDRF supplements the SDRF in cases of severe disasters where funds are insufficient.
- However, heatwaves are not currently included as a notified disaster under the Act. Although heatwaves are a significant concern in India, particularly in certain regions, the Finance Commission has not been convinced to expand the list of notified disasters.
- States can use up to **10% of their SDRF allocation for local disasters**, including heatwaves, which some states have done.

NDMA:

- The **National Disaster Management Authority (NDMA)** plays a crucial role in laying down policies, plans, and guidelines for disaster management in India.
- It aims to promote a national resolve to mitigate the damage and destruction caused by natural and man-made disasters through sustained and collective efforts.

**The Telangana High Court has ruled against a taxpayer against whom the revenue department had invoked the General Anti-avoidance Rule (GAAR).**

General Anti-Avoidance Rule (GAAR):

- GAAR is an **anti-tax avoidance** law in India to curb tax evasion and avoid tax leaks.
- It came into effect on 1st April 2017.
- The GAAR provisions come under the **Income Tax Act, 1961**.
- GAAR is a tool for checking aggressive tax planning, especially those transactions or business arrangements that are entered into with the objective of avoiding tax.
- It is specifically aimed at cutting revenue losses that happen to the government due to aggressive tax avoidance measures practiced by companies.
- It is meant to apply to transactions that are prima facie legal, but result in tax reduction.

- Broadly, tax reduction can be divided into three categories.
- **Tax mitigation** is a 'positive' term in the context of a situation where taxpayers take advantage of a fiscal incentive provided to them by tax legislation by complying with its conditions and taking cognisance of the economic consequences of their actions.
- Tax mitigation is permitted under the Act. This tax reduction is acceptable even after GAAR has come into force.
- **Tax evasion** is when a person or entity does not pay the taxes that are due to the government.
- This is illegal and liable to prosecution. Illegality, wilful suppression of facts, misrepresentation, and fraud—all constitute tax evasion, which is prohibited under law.
- This is also not covered by GAAR, as the existing jurisprudence is sufficient to cover tax evasion/Sham transactions.
- Tax avoidance includes actions taken by a taxpayer, none of which **are illegal or forbidden by the law.**
- However, although these are not prohibited by the law, they are considered **undesirable and inequitable** since they undermine the objective of effective collection of revenue.
- GAAR is specifically against transactions where the sole intention is to avoid tax.

- In this, the taxpayers used legal steps which results in tax reduction, which steps would not have been undertaken if there was no tax reduction.
- This kind of tax avoidance planning is sought to be covered by GAAR.
- With GAAR, there is no difference between **tax avoidance and tax evasion**. All transactions which have the implication of avoiding tax can come under the scanner of GAAR.

**The EU's recently passed EU AI Act, which will be rolled out in phases over the next two years, has ignited a battle over data transparency.**

New AI Rules of European Union:

- **Template:** The **EU's AI Office** plans to release a template for organisations to provide "detailed summaries" of the content/ data used by organisations who deploy general-purpose AI models, such as ChatGPT, to train their AI models following a consultation with stakeholders.
- **Objective:** To ensure an appropriate balance between the legitimate need to protect trade secrets and, on the other hand, the protection of privacy and creators' rights over their content, including copyright holders' rights to exercise their rights under Union law.
- **Datasets as Trade Secret:** AI companies are highly resistant to revealing what their models have been trained on, describing the information as a trade secret that would give competitors an unfair advantage if made public.
- **Ethically Sourced Content:** Technology companies have signed a flurry of content-licensing deals with media outlets and websites.



- Example: OpenAI signed deals with the Financial Times and The Atlantic, while Google struck deals with NewsCorp (NWSA.O), opening a new tab social media site Reddit.

*Need for Transparency Rules:*

- **Breach of copyright:** In the past few years, a few big tech companies, including Google, OpenAI, and **Stability AI**, have faced lawsuits from creators claiming their content was improperly used to train their models.
- **Ensure fair remuneration:** There is a growing call for tech companies to pay fairly, the copyrights holders for data used by them to train their AI models.
- **Right of consent and privacy:** Every creator should have the right to know if their work, songs, voice, art, or science was used in training the algorithm.
- Example: OpenAI has faced backlash for featuring an AI-generated voice described as “eerily similar” to her own by actress Scarlett Johansson in a public demonstration of the newest version of ChatGPT.

***Artificial Intelligence?***

- Artificial intelligence (AI) is the theory and development of computer systems capable of performing tasks that historically required human intelligence, such as recognizing speech, making decisions, and identifying patterns.
- **Umbrella term:** It encompasses a wide variety of technologies, including **machine learning**, **deep learning**, and **natural language processing (NLP)**.

- Concerns: privacy, system bias, and violation of intellectual property rights.

Challenges:

- The Data transparency rules have the potential to hinder the European AI startups' competitiveness.
- **Affect Europe's AI ecosystem:** The rules can result in the shift of the AI ecosystem from Europe to other countries and Europe can be reduced into becoming a consumer of American and Chinese products.
- **Bad Regulation:** Pre Mature regulation of emerging Technologies like AI can hinder innovation in the sector running the risk of regulating technologies that haven't been mastered, or regulating them badly because it has not been mastered.
- **Widespread Implication:** The rules will have big implications for smaller AI startups and big tech companies like Google (GOOGL.O), and Meta (META.O), which have put the technology at the centre of their future operations.

Way Forward

- **Awareness of Rights:** People should have the awareness that they are communicating or interacting with an AI system as well as duly informing users of the capabilities and limitations of that AI system and affected persons about their rights.
- **Traceability:** AI systems shall be developed and used in a way that allows appropriate traceability and explainability in case of any wrong and harmful information.

- **Transparency:** The technical infrastructure of AI systems should be transparent in their functioning so that users can understand the process and logic behind the decisions made.
- This includes providing an explanation of how an AI system arrived at its decisions, as well as information on the data used to train the system and the accuracy of the system.

**President Murmu has rejected a mercy petition filed by Pakistani national Mohammed Arif who was sentenced to death for the December 22, 2000 terrorist attack at the Red Fort in which three people including two Army jawans were killed.**

The court has reaffirmed the “rarest of rare” standard in several decisions.

The Report of **the 262nd Law Commission**, published in 2015, recommended the “absolute abolition” of the death penalty “for all crimes other than terrorism-related offences and waging war”

Constitutional Provisions:

- **Article 21** (Right to Life and Personal Liberty) guarantees the right to life and personal liberty.
- Any deprivation of this right must follow **the procedure established by law**.
- **Article 72 and Article 161** provide the President and Governors with the power to grant pardons, reprieves, respites, or remissions of punishment or

to suspend, remit, or commute the sentence of any person convicted of any offence.

- **Article 72:** Grants the President of India the power to grant pardons, reprieves, respites, or remissions of punishment, or to suspend, remit or commute the sentence of any person convicted of any offense.
  - In all cases where the punishment or sentence is by a Court Martial.
  - In all cases where the punishment or sentence is for an offence against any law relating to a matter to which the executive power of the Union extends.
  - In all cases where the sentence is a sentence of death.
- **Article 161:** Provides similar powers to the Governor of a state.
  - There is no time limit given in these two Articles for Mercy Plea.
  - These Articles have no binding effect on the President and the Governors of the states to accept all the Mercy Petitions.

Judicial Principles:

- **Rarest of the Rare Doctrine:** Established in the landmark case of **Bachan Singh v. State of Punjab (1980)**, the Supreme Court of India held that the death penalty should only be awarded in the "rarest of the rare" cases, where the alternative option is unquestionably foreclosed.
- **Proportionality and Balancing Aggravating and Mitigating Circumstances:** Courts must weigh aggravating circumstances (such as the nature and gravity of the crime) against mitigating circumstances (such

as the socio-economic background, age, or mental condition of the offender) before deciding on the death penalty.

- **Judicial Review and Confirmation:** The death sentence pronounced by a trial court must be confirmed by the High Court.
- Further, the Supreme Court can review the case, and there are provisions for mercy petitions to the President and Governors.

Statutory Provisions:

- **Indian Penal Code (IPC), 1860:** Specifies offences that are punishable by death, including murder (Section 302), treason (Section 121), terrorism-related offences (Section 121A), and others.
- **Code of Criminal Procedure (CrPC), 1973:** Provides procedural safeguards for the accused in death penalty cases, such as the requirement for the sentence to be confirmed by a higher court (Section 366) and the right to appeal (Section 374).
- **Special Laws:** Certain special legislation, such as the Terrorist and Disruptive Activities (Prevention) Act (TADA), Narcotic Drugs and Psychotropic Substances Act (NDPS), and Protection of Children from Sexual Offences Act (POCSO), also prescribe the death penalty for specific crimes.

**SIM cards issuance**

- The Punjab and Haryana High Court urged the Centre to intensify efforts in monitoring and regulating the issuance of multiple prepaid SIM cards to individuals amid rising online frauds.

- In Sumit Nandwani's case, Punjab and Haryana HC suggested restricting one SIM card per individual.

**Existing provisions**

- In "State (NCT of Delhi) vs. Navjot Sandhu alias Afsan Guru", the Supreme Court restricted the sale of SIM cards without identity verification.
- The Department of Telecommunications (DoT) under the Ministry of Communications then issued notifications in 2006 and 2009 for banning the sale of pre-activated SIM cards.
- A pre-activated SIM card does not need ID proof or form and can be immediately being inserted into the phone.
- Avishek Goenka vs. Union of India (2012) case: The petitioner highlighted that pre-activated SIM cards are still being sold, necessitating government action.
- Telecom Ministry issued a circular that an individual category customer (i.e., local, outstation, and foreign) can subscribe to "a maximum of nine mobile connections" in his or her name across all telecom service providers and Licensed Service Areas (LSAs).
- The limit was set at six connections for people in Jammu & Kashmir, Assam, and the Northeast LSAs.
- Declaration from individuals about the connections already held was also mandated.

### **Linking AADHAR with mobile phones**

- KS Puttaswamy vs. Union of India (2018): The fundamental right to privacy was upheld. However, in this case, linking Aadhar with SIM cards is not mandatory.
- Section 3(7) of the Telecommunications Act 2023: It states that entity issuing SIM cards must identify the person to whom the service is being provided using any verifiable biometric-based identification.
- Since the only biometric-based identification in India is Aadhar, one can invariably assume that Aadhar is now mandatory for accessing any telecom services, including purchasing a SIM card.

### **SIM (Subscriber Identity Module)**

- It is an integrated circuit (IC) intended to securely store an international mobile subscriber identity (IMSI) number and its related key.
- These are used to identify and authenticate subscribers on mobile telephone devices (such as mobile phones and laptops).
- SIM cards are also used in satellite phones, smart watches, computers, or cameras.

### **Pro-Tem Speaker**

- Senior Congress leader K Suresh, the most senior member of the Lok Sabha, is expected to be appointed Pro-Tem Speaker for the first session of the 18th Lok Sabha.
- **Legal Provisions Related to the Pro-Tem Speaker**

- The Indian Constitution does not specifically mention the post of the Pro-Tem Speaker.
- The 'Handbook on the Working of the Ministry of Parliamentary Affairs' provides guidelines for the appointment and swearing-in of the Pro-Tem Speaker.
- Article 94 of the Constitution states that the Speaker shall not vacate the office until immediately before the first meeting of the new Lok Sabha after a dissolution.
- Article 99 mandates that every Member of Parliament must make and subscribe to an oath or affirmation before taking a seat in the House.

#### **Appointment Process and Functions of Pro-Tem Speaker**

- The President appoints the senior member of the Lok Sabha (in terms of the number of years as a member) as the Pro-Tem Speaker to perform the duties of the Speaker until a new Speaker is elected.
- The Legislative I Section of the Government of India compiles a list of the senior most Lok Sabha members, which is submitted to the Minister of Parliamentary Affairs or the Prime Minister.
- With the members' consent, the Minister then seeks the President's approval for their appointments.
- The President administers the oath to the Pro-Tem Speaker, who then administers the oath to three members appointed by the President.



- Assisted by these members, the Pro-Tem Speaker then administers the oath to the newly elected MPs.
- After the swearing-in, the Pro-Tem Speaker presides until the new Speaker is elected.
- The election, overseen by the Pro-Tem Speaker, is conducted through a motion moved by the PM.

**Recently, the Union government notified the Public Examinations (Prevention of Unfair Means) Bill, 2024, effective June 21, 2024.**

Background Of Public Examinations Bill 2024:

- The NEET-UG 2024 exam faced allegations of question paper leaks, and grace marks were awarded to over 1,500 students.
- **Data Estimates:** Estimates indicate that over 70 cases of question paper leaks occurred in the country between 2016 and 2023, affecting more than 1.5 crore students.
- Data shows that at least 12 recruitment drives in Rajasthan were cancelled between 2018 and February 2023 due to paper leaks.

Key Provisions of the Public Examinations Bill 2024:

- It aims to prevent the use of “unfair means” in public examinations and bring “greater transparency, fairness and credibility”.
- **Definition of Public Examinations:** Public Examinations refer to any examination conducted by a public examination authority listed in

the **Schedule of the Public Examinations Bill** or any other authority that may be notified by the Central Government.

- The Schedule includes the Union Public Service Commission (UPSC), Staff Selection Commission (SSC), Railway Recruitment Boards (RRBs), Institute of Banking Personnel Selection (IBPS), and National Testing Agency (NTA).
- **Exclusion of Candidates:** Bona fide candidates of public examinations are excluded from the scope of the Act. Defaulting candidates will not be punished under this Act; instead, appropriate action will be taken by the respective public examination authority.
- **Broad Definition of Unfair Means:** The Act defines 15 actions that constitute the use of unfair means in public examinations “for monetary or wrongful gain.”
- These include leaking question papers or answer keys, directly or indirectly assisting candidates, willfully violating norms or standards, tampering with computer networks or resources, creating fake websites, and more.
- **Cognisable Offence:** Section 9 of the Act stipulates that all offences are **cognisable, non-bailable, and non-compoundable**.
- Consequently, arrests can be made **without a warrant**, and bail is not granted as a matter of right.
- Instead, a magistrate will decide if the accused is eligible for release on bail.
- **Organised Crime:** Section 11 of the Act pertains to organised crime, prescribing penalties of 5 to 10 years of imprisonment and fines up to 1 crore rupees.

- If any institution is involved in committing an organised crime, its property will be liable to attachment and forfeiture by the government.
- **Punishment for Violations:** Imprisonment for three to five years and a fine of up to Rs 10 lakh. If the convict fails to pay the fine, additional imprisonment will be imposed according to the provisions of the **Bharatiya Nyaya Sanhita, 2023**.
- Those involved in conducting the examination can be fined up to Rs 1 crore, along with other penalties.
- **Investigating Authority:** The Act authorises the Central Government to refer any case under its jurisdiction to a **Central Investigating Agency** as needed to ensure the matters are handled swiftly and with due diligence.
- **National Technical Committee on Public Examinations:** The bill proposes establishing a high-level committee to enhance the security of the computerised examination process.
- This committee will be responsible for developing protocols to protect digital platforms, creating robust IT security systems, ensuring electronic surveillance of examination centers and setting national standards for IT and physical infrastructure used in conducting examinations.
- **Designation of a Public Servant:** The Act designates officials of the public examination authority as public servants to ensure accountability and transparency in the process.

- Consequently, appropriate administrative action can be taken against any defaulting public servants in accordance with the authority's service rules and procedures.

*Need for Law to Prevent Unfair Means in Public Examinations:*

- **Lack of Substantive Law:** No specific substantive law currently addresses unfair practices or offenses by entities conducting public examinations for the central government and its agencies.
- **Existence of Unfair Practices:** Malpractices in public examinations lead to delays and cancellations, negatively impacting the prospects of millions of youth.
- **Ensuring Transparency, Fairness, and Credibility:** The Public Examinations Bill aims to enhance transparency, fairness, and credibility in the examination system, ensuring that students' genuine efforts are fairly rewarded.

**What is Enemy Agents Ordinance of J&K?**

- Those people found assisting militants in J&K should be tried by investigating agencies under the Enemy Agents Ordinance, 2005.
- The law is more stringent than the **Unlawful Activities (Prevention) Act (UAPA)** and has the punishment of either a life term or a death sentence.
- **Background of the J&K Enemy Agents Ordinance:**

- Origin: It was first issued in 1917 by the then **Dogra Maharaja of J&K** and is referred to as an 'ordinance' since laws made during the Dogra rule were called ordinances.
- After Partition in 1947: Ordinance was incorporated as a law in the erstwhile state and was also amended.
- Enemy Agents Ordinance 2005: It was promulgated under Section 5 of the **Jammu and Kashmir Constitution Act 1996**.
- In 2019: When Article 370 of the Constitution was repealed, J&K's legal framework also underwent several changes.
- J&K Reorganisation Act listed out state laws that were to continue while several others were repealed and replaced with Indian laws.
- For example, while the security laws such as Enemy Agents Ordinance and Public Safety Act remained, the **Ranbir Penal Code** was replaced with the Indian Penal Code.

**Salient Provisions of the J&K Enemy Agents Ordinance:**

- Trials under the ordinance: The trial under the Enemy Agents Ordinance is conducted by a special judge who is appointed by the "government in consultation with the High Court".
- Under the ordinance, the accused cannot engage a lawyer to defend herself unless permitted by the court.
- Appeal against the verdict: There is no provision for appeal against the verdict.

- The decision of the special judge can only be reviewed by a person chosen (by the Govt) from the judges of the HC and the decision of that person shall be final.
- Bar on ordinance: The ordinance also bars any disclosure or publication of the case tried under it.
- Any person who, without the previous authorisation of the Government, discloses or publishes any information with respect to any proceedings or with respects to any person proceeded against under this Ordinance, shall be punishable with imprisonment for a term which may extend to two years, or with fine, or with both

#### **Terms Defined in Enemy Agents Ordinance 2005**

- **“Enemy”**: It means and includes any person, directly or indirectly, participating or assisting in the campaign recently undertaken by raiders from outside in subverting the Government of Union territory of Jammu and Kashmir established by law in the Union territory of Jammu and Kashmir
- **“Enemy agent”**: 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.
- Penalty for aiding the enemy: According to the ordinance, anyone deemed an enemy agent or who conspires to assist the enemy, impede Indian military or air operations, endanger lives, or commit arson can be punished with death, life imprisonment, or rigorous imprisonment up to 10 years, along with a fine.

Constitution of India guarantees the following Fundamental Rights available to individuals upon being arrested

Article 22:

- The person should be conveyed the grounds of arrest.
- Within 24 hours of the arrest, the person should be brought before a magistrate.
- Right to consult a lawyer.
- The right to a fair, just, and speedy trial is provided under Article 14 and 21 as laid down in the case of **Huissainara Khatoon v. State of Bihar**.
- Right to free legal aid is accorded **under Article 39A**.
- This is violative of the right to equality (Article 14), free speech (Article 19) and life (Article 21) of the Constitution.

**Challenges:**

- Curtails Fundamental Rights: An individual may be identified as a terrorist without any judicial scrutiny and even before the commencement of a trial.
- Impact on Civil Liberties: UAPA may infringe on civil liberties, including the right to a fair trial.
- For instance, in **Romila Thapar v. Union of India** case filed against the arrest of five activists after inter-caste violence in Bhima Koregaon, SC clarified that state cannot infringe upon an individual's liberty based on speculation.

- Guilty Until Proven Innocent: A presumption of innocence of the accused until they are proven guilty at the end of the judicial process is the basis of most of the criminal justice systems.
- Enemy Agents Ordinance 2005 takes away this right from individuals because even in the absence of any trial or any judicial scrutiny, the law allows a person to be declared a terrorist.
- Admissibility of Confessions: The Act allows confessions made to police officers to be admissible in certain circumstances which might lead to coerced confessions and undermine the principles of fairness and due process.

### eSakshya App

Days ahead of the implementation of the three criminal laws, the Union Ministry of Home Affairs (MHA) is testing eSakshya (e-evidence).

#### **eSakshya App:**

- It is a mobile-based application to **help police record the scene of crime**, search and seizure in a criminal case and upload the file on the cloud-based platform.
- Process: The police official will have to upload a selfie after the procedure is complete.
- Each recording could be a maximum four minutes long and several such files could be uploaded for each **First Information Report (FIR)**, according to the details shared with State police departments.



- *Developed by:* The mobile application developed by the **National Informatics Centre (NIC)** will be available to all police stations which register and download the App.

**Ahead of the implementation of the new criminal laws, at least 23 modifications have been made to the Crime and Criminal Tracking Network Systems (CCTNS).**

**Crime and Criminal Tracking Networks and Systems (CCTNS):**

- CCTNS was conceptualized by the Ministry of Home Affairs under the **National e-governance plan of India** and is being implemented as a "**Mission Mode Project (MMP)**" since 2009.
- It is an ambitious project that aims to put in place a comprehensive and integrated system for enhancing the efficiency and effectiveness of policing at the police station level throughout the country.
- It aimed to interlink all police stations under a common application software for the purposes of investigation, data analytics, research, policymaking and providing Citizen Services such as reporting and tracking of complaints, requests for antecedent verifications by Police, etc.
- The records of crimes and criminals available at one police station will be accessible to any other police office.

Objectives

- Make the Police functioning citizen-friendly and more transparent by automating the functioning of Police Stations.

- Improve the delivery of citizen-centric services through effective usage of ICT.
- Provide the Investigating Officers of the Civil Police with tools, technology, and information to facilitate the investigation of crimes and the detection of criminals.
- Improve police functioning in various other areas such as Law and Order, Traffic Management, etc.
- Facilitate interaction and sharing of information among Police Stations, Districts, State/UT Headquarters, and other Police Agencies.
- Assist senior Police Officers in better management of Police Force.
- Keep track of the progress of cases, including in Courts.
- Reduce manual and redundant record-keeping.
- The project is being implemented with close collaboration between the States and the Union Government.
- The National Crime Records Bureau (NCRB) is the central nodal agency that would manage CCTNS.

**National Crime Records Bureau (NCRB):**

- It was established in **1986** to act as a repository of information on crime and criminals.
- It comes under the **Ministry of Home Affairs (MHA)**, Government of India.

- It was set up based on the recommendations of the **Tandon Committee, the National Police Commission (1977-1981)**, and the Task Force of the Home Ministry.
- It is responsible for **collecting and analysing crime data** as well as serving as a repository of such information to aid investigators in tracing crimes and criminals.
- **Headquarters: New Delhi**
- The **Central Finger Print Bureau** under the NCRB is a national repository of all fingerprints in the country.
- NCRB also compiles and publishes **National Crime Statistics** i.e. Crime in India, Accidental Deaths & Suicides, and also Prison Statistics.
- NCRB also assists various States in capacity building in the areas of Information Technology, CCTNS, Finger Prints, Network security, and Digital Forensics.

### **Pharma Research in AyurGyan And Techno Innovation “PRAGATI- 2024”.**

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

#### PRAGATI-2024:

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

Central Council for Research in Ayurvedic Sciences (CCRAS):

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

Achievements of CCRAS:

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

Prominent Initiatives:

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

AYUSH Medicine System

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

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

Doctrine of Merger:

- It is a common law doctrine founded on the principle of maintenance of decorum and propriety in the functioning of courts and tribunals.
- The doctrine of merger provides that when an appellate court passes an order, the order passed by the lower court is merged with that order.
- The underlying logic is **that there cannot be more than one decree or operative order governing the same subject matter at a given point of time.**
- The doctrine solves the issue of **which order must be enforced** and given importance if there are multiple orders passed by both subordinate and superior courts on a single issue.
- It clarifies and provides that in this situation, the order passed by the superior court or the successive order would prevail and that the order of the lower court would be merged with the order passed by the superior court.
- The doctrine is **not recognized statutorily** but is a statement of judicial propriety and seeks to instil discipline in the functioning of subordinate adjudicating authorities, whether judicial, quasi-judicial, or administrative.
- Doctrine of Stare Decisis:
- The doctrine of Stare Decisis refers to **the concept that courts must follow previously made judicial decisions** in cases where the same legal issues are brought before them in subsequent matters.
- It means that courts refer to previous, similar legal issues to guide their decisions.

- Such previous decisions that courts refer to are known as “**precedents**”.
- Precedents are legal principles or rules that are created by the decisions given by courts.
- Such decisions become an authority or an example for the judges to decide similar legal cases/issues in the future.
- The doctrine of Stare Decisis creates an obligation on courts to refer to precedents when taking a certain decision.

### DEFENCE AND SPACE

#### **Rocket with a 3D- printed engine has been launched by space start-up Agnikul Cosmos Private Limited**

- Agnikul Cosmos became the first company in the country to sign an agreement with ISRO under the IN-SPACE initiative to have access to the space agency’s expertise and its facilities to build **Agnibaan** in 2020.

#### *Agnibaan SubOrbital Technology Demonstrator (SOrTeD):*

- Agnibaan SubOrbital Technology Demonstrator-
- **The Rocket:** The Rocket named, Agnibaan SubOrbital Technology Demonstrator (SOrTeD) comprises **a single piece 3D-printed engine** designed and built indigenously, is launched from Sriharikota.

- **Sub- Orbital Launch:** The mission was designed to reach a height of about 8 kilometres before splashing into the sea.
- Agnibaan SORTeD will be Agnikul's first flight and the **second launch by a private startup in India.**
- 1st private rocket launch: Private launch provider **Skyroot, achieved its first sub-orbital launch in 2022**
- Private Launchpad: Agnibaan SORTeD **is India's first launch from a private mobile launchpad, called 'Dhanush'**, established by Agnikul.
- **India's first semi- cryogenic engine:** Agnibaan SORTeD is also India's first semi-cryogenic engine powered rocket launch making it the first-ever controlled flight of a semi-cryogenic liquid engine realised through additive manufacturing.
- The engine called, **Agnilet**, uses sub-cooled oxygen as fuel.
- **Purpose:** To serve as a test flight and demonstrate in-house and home-grown technologies, gather crucial flight data and ensure optimal functioning of systems for Agnikul's orbital launch vehicle, the 'Agnibaan'.
- **Payload capacity:** While this was a suborbital launch, the vehicle can fly payloads ranging from 30 kg to 300 kg.
- **Competitive edge:** The use of the 3D-printed manufacturing process is likely to lower the launch cost and cut down the vehicle assembly time.
- Usually engine parts are manufactured separately and assembled later. Agnibaan is the world's most integrated single shot 3D printed piece, signalling the unparalleled ability to rapidly assemble rockets.



**China's space agency said that China landed an uncrewed spacecraft on the far side of the moon on 2nd of June.**

Chang'e-6:

- The Chang'e-6 craft successfully landed in the **South Pole-Aitken Basin** on the back of the moon.
- It is the first human sampling and **return mission from the far side of the moon** for the first time.
- It was launched by a Chinese **Long March-5 rocket** from Wenchang Space Launch Center on the southern island of **Hainan** before 53 days.
- Chang'e-6 consists of an orbiter, a returner, a lander and an ascender.
- The lander was equipped with multiple sensors, including microwave, laser and optical imaging sensors which can measure distance and speed, and identify obstacles on the lunar surface.
- The probe is scheduled to complete sampling within two days. It has adopted two methods of moon sampling, which include:
  - Using a drill to collect subsurface samples
  - Grabbing samples on the surface with a robotic arm.
- It has achieved a breakthrough in the design and control technology of the lunar retrograde orbit and aims to realize key technologies of intelligent and rapid sampling.

- It marks the second time a mission has successfully reached the far side of the moon. China first completed that historic feat in 2019 with its Chang'e-4 probe.

**NASA's James Webb Space Telescope (JWST) finds most distant known Galaxy JADES-GS-z14-0.**

- They used JWST for observations as part of the JWST Advanced Deep Extragalactic Survey (JADES) program.
- JADES-GS-z14-0 was first seen using **JWST's NIRC**am, a powerful camera that captures near-infrared light.
- **NIRSpec**: Confirmed extreme distance (high redshift).
- **MIRI**: Provided more details and confirmed vast distance.
- Galaxy:
- It is a system of stars, stellar remnants, interstellar gas, dust, and dark matter bound by gravity.
- Variety and Size:
- **Star Count**: Average galaxy contains about 100 million stars.
- **Size Range**: From dwarf galaxies with less than a thousand stars to supergiant galaxies with up to one hundred trillion stars.
- **Dark Matter**: Most of a galaxy's mass is dark matter; stars and nebulae make up only a small percentage.
- **Central Features- Supermassive Black Holes**: Commonly found at the centers of galaxies.
- Classification:
- Galaxies are categorized by shape:

- Elliptical
- Spiral (e.g., Milky Way)
- Irregular
- Why is the galaxy so bright in the center?
- The center of the galaxy is known as the **Galactic Bulge**
- It is the brightest due to the presence of more stars.
- In addition to the above, Stars within the galactic bulge orbit the centre in various planes.

Galaxy JADES-GS-z14-0:

- It is the **most distant known galaxy** from Earth.
- **Formation:** JADES-GS-z14-0 was formed approximately **290 million years** after the Big Bang.
- Previously, the earliest-known galaxy was dated to 320 million years post-Big Bang.

Characteristics of Galaxy JADES-GS-z14-0

- **Unique Properties:** The galaxy contains young stars and significant ionized gas emission.
- **Size:** Measures about 1,700 light-years across.
- **A light year is 9.5 trillion kilometers.**
- **Mass:** Equivalent to 500 million stars the size of the Sun.

Findings of Galaxy JADES-GS-z14-0:

- **Strong ionized gas emissions:** Researchers found evidence of strong ionized gas emissions (including hydrogen and oxygen) within the galaxy.
- The presence of oxygen suggests that multiple generations of massive stars had already lived their lives before observing the galaxy.

**The US recently conducted an unarmed Minuteman III intercontinental ballistic missile test from the Californian Vandenberg Space Force Base.**

Minuteman III:

- The **LGM-30G Minuteman III** is a solid-fueled, **intercontinental ballistic missile (ICBM)**, which the United States Air Force (USAF) first deployed in the 1960s.
- It is the sole land-based component of the U.S. nuclear triad.
- It was designed and manufactured by the Boeing Corporation.
- Originally, it was only supposed to be kept in service for about ten years, but instead, it has been modernized as its replacement, the Ground-Based Strategic Deterrent (GBSD), is due to become available for use in 2029.
- It was the **first U.S. missile** fitted with **multiple independently targetable reentry vehicles (MIRVs)**.
- The United States currently has an estimated 440 Minuteman III missiles in its arsenal.

Features:

- It is a **three-stage, solid-fuel missile**.

- The missile is 18.2 m long with a diameter of 1.85 m and a launch weight of 34,467 kg.
- It has a maximum range of **13,000 km** and is capable of carrying a payload of **three reentry vehicles**.
- It now carries a **single nuclear warhead** pursuant to arms control agreements between the United States and Russia.
- It has a fast launch time, nearly 100 percent testing reliability, and backup airborne launch controllers to preserve retaliatory capabilities.

**The Space Agency ISRO recently announced a satellite mission, TRISHNA.**

- **This TRISHNA mission is a joint infrared earth observation satellite mission between India and France.**

TRISHNA Mission:

- TRISHNA refers to **Thermal Infra-Red Imaging Satellite for High-Resolution Natural Resource Assessment**.
- **Objectives:** The Primary Goal of TRISHNA mission is to monitor surface temperature and water management globally.
- It will address extreme heat issues in India and Europe.

Launch Details:

- **Tentative Launch:** 2025
- **Mission Lifespan:** 5 years
- **Features:** There are two primary payloads in satellites.
- The Thermal Infra-Red (TIR) payload

- It will be provided by the French space agency CNES
- The TIR payload will feature a four-channel long-wavelength infrared imaging sensor for studying high-resolution surface temperatures.
- It will also **map the heat radiated back from land** in different regions.
- The **Visible Near Infrared-Red Short Wave Infrared-Red (VNIR-SWIR)** payload
- It will be developed by ISRO
- The VNIR-SWIR payload will **map the reflectivity (albedo) of the Earth's surface** across seven bands.
- This mapping will measure the amount of heat reflecting off the Earth's surface.
- It will also calculate various biophysical and radiation budget variables.

*Benefits of TRISHNA Mission:*

- **Improved Water Management:** TRISHNA mission will provide data on evapotranspiration.
- **Evapotranspiration Monitoring:** Includes soil evaporation and water transpiration from plants.
- It helps monitor agricultural water use and maintain soil moisture levels during droughts.
- It also provides vital data to manage the increasing droughts affecting Indian farmers.

- **Study of water presence:** It will also study water presence and concentration, including melting glaciers, to improve water resource management globally.
- **Enhanced Climate Monitoring:** The mission will track thermal anomalies, surface energy balance, and urban heat islands to understand the impact of climate change.
- It will study aerosols, water vapour, and cloud cover to improve our understanding of atmospheric processes.
- **Sustainable Practices Policies:** The data will be used to develop new policies for sustainable water management by watershed managers, agro-industries, and farmers.
- The high-resolution, high-repeat imaging will improve our understanding of Earth's natural processes to aid in global climate change mitigation efforts.
- **Advancement in Remote Sensing Technology:** TRISHNA is expected to be a significant advancement in remote sensing technology, which is crucial for monitoring Earth from space during extreme weather events.

Global Impact of the Trishna Mission:

- *Contribution to Sustainable Development Goals (SDGs)-*
- **Water Scarcity and Management:** Addresses issues related to water scarcity and management (**SDG 6**).
- **Climate Action:** Supports initiatives for climate action (**SDG 13**).
- *International Cooperation and Knowledge Transfer-*
- **Strengthening Ties:** Enhances cooperation between participating nations.

- Expertise Exchange: Promotes the exchange of expertise in space technology.
- Capacity Building: Facilitates capacity building in space technology among the involved countries.

### **ISRO's Reusable Launch Vehicle (RLV) Programme**

Recently, the Indian Space Research Organisation (ISRO) informed that it is all set to carry out the **third and final RLV Landing Experiment (RLV LEX)** under the Reusable Launch Vehicle (RLV) Programme.

- RLV-LEX missions involve taking an unmanned winged prototype, christened Pushpak, to a designated height and releasing it to land safely under varying conditions.
- The configuration of RLV-TD is similar to that of an aircraft and combines the complexity of **both launch vehicles and aircraft.**
- The winged RLV-TD has been configured to act as a flying test bed to evaluate various technologies, namely, **hypersonic flight, autonomous landing, and powered cruise flight.**
- In the future, this vehicle aims to be scaled up to become the **first stage of India's reusable two-stage orbital launch vehicle.**

#### **Third and Final RLV LEX**

– The unmanned winged prototype, christened **Pushpak**, will be carried to a height of 4.5 km and 500 metres to one side of the runway using an IAF Chinook helicopter and released.

a. The **LEX-01 and LEX-02** were carried out successfully in early 2023 and



2024 respectively.

– It aims to look at how the sink rate, or the rate of descent, can be cut down to reduce the impact load. It will also have on board a **real-time**

**kinematics (RTK) package.**

– It is a more **challenging mission compared to the second one**, where the altitude was the same but the lateral distance from the runway was 150 metres.

– Another challenge before the upcoming mission is **handling tailwind conditions.**

#### **Significance of the Experiment**

- It marked a significant milestone in ISRO's journey towards achieving **low-cost access to space**. The successful execution of the landing experiment demonstrated **ISRO's capability to develop a reusable launch vehicle**, which is expected to significantly **reduce the cost of launching satellites into orbit**.
- **The RLV-TD programme** is a testament to ISRO's commitment to **innovation and technological advancement**. With the successful completion of this landing experiment, ISRO has moved one step closer to realising its **vision of developing a fully reusable launch vehicle**.
- After the successful completion of the RLV-LEX series, ISRO plans to proceed with the **next stage of tests under the RLV-TD Programme**, involving an unmanned **Orbital Re-entry Vehicle (ORV)** that is 1.6 times the size of 'Pushpak' used in the LEX missions.
  - The ORV will be placed in a 400-kilometre orbit around Earth using a modified **Geosynchronous Satellite Launch Vehicle (GSLV)**

- **Reusable Launch Vehicle (RLV) Technology**

– It is being explored by several countries and organisations like the Japan Aerospace Exploration Agency (JAXA), the United Launch Alliance (ULA), and the European Space Agency (ESA), along with the ISRO.

**Global Demonstration**

– **NASA:** Reusable space vehicles have been in existence for a long time with NASA space shuttles carrying out dozens of human space flight missions.

– **SpaceX:** The use case for reusable space launch vehicles has revived with the **private space launch services** provider SpaceX demonstrating partially reusable launch systems with its **Falcon 9 and Falcon Heavy** rockets since 2017.

SpaceX is also working on a fully reusable launch vehicle system called Starship.

**25<sup>th</sup> anniversary of Kargil war victory**

As part of the **25th year celebration of Kargil war victory** over Pakistan, a team of the Indian Army has embarked on a **pan-India motorcycle expedition** from **Dhanuskhodi (Tamil Nadu) to Dras (UT of Ladakh)**.

### **Kargil War**

- The Kargil War, fought from **May to July 1999** in the **Kargil region** and elsewhere along the **Line of Control (LoC)**, was a testament to the resilience and bravery of the Indian armed forces.
- It commenced **shortly after the signing of the Lahore declaration in 1999**, when the Pakistan Army surreptitiously occupied the winter-vacated posts of the Indian Army.
- The conflict was triggered by the infiltration of Pakistani troops — disguised as Kashmiri militants — into strategic positions on the Indian side of the LoC.
- The Indian Army, later supported by the Indian Air Force, recaptured a majority of the positions on the Indian side of the LoC.

### **Operation Vijay**

- In India, the **conflict is also referred to as Operation Vijay**, which was the codename of the Indian military operation in the region.
- The Indian Air Force acted jointly with the Indian Army to flush out the Pakistan Army and paramilitary troops from vacated Indian positions along the LoC.
  - It was a unique display of bravery, resolve, and commitment under inhospitable conditions of terrain and weather.

### **Aftermath**

- The war came to an **end on 26 July 1999**, marking a **significant victory for India**.
- Ever since the victory in Operation Vijay, 26 July is celebrated as the **'Kargil Vijay Diwas'** every year.

### Nagastra - 1

- Indian Army has received the 1st batch of man-portable suicide drones, Nagastra-1.
- The high-tech drones are designed and developed indigenously by Economic Explosives Limited (EEL), a subsidiary of Solar Industries, Nagpur.

**Nagastra-1**  
Nagastra-1 is a fixed-wing electric unmanned aerial vehicle which is a loitering munition

**450** completely indigenous UAVs to be purchased by the Indian Army

More than **75%** indigenous parts

**RANGE**  
30KM AUTONOMOUS MODE

**15KM** MAN-IN-LOOP

**ENDURANCE**  
60 MINS

Day-night surveillance cameras  
Fragmenting warhead

**KAMIKAZE MODE**  
Neutralise any hostile threat with an accuracy of **2 meters** USING GPS

If the mission is cancelled, the UAV can be called back and make a soft landing through a parachute recovery mechanism

- Nagastra is a fixed-wing electric unmanned aerial vehicle with an endurance of 60 minutes.
- Unlike other weapons, Solar's Nagastra has the capability to abort an attack if necessary and can be safely retrieved.
- It is named a loitering munition weapon due to its ability to hover over the target.
- It can carry a 1-kilo warhead and carry out a precision strike via GPS with an accuracy of within two metres.
- It offers a 15 km range with man-in-loop control and extends up to 30 km in autonomous mode.
- Due to its electric propulsion system, Nagastra-1 provides a low acoustic signature, making it almost undetectable at altitudes over 200 metres.
- It has a 'Kamikaze mode' in which it can search and destroy any target by crashing into it.
- It is equipped with day and night surveillance cameras.
- It has been designed to hit enemy training camps, launch pads, and infiltrators and thus reduce risk to soldiers.

**India's Nuclear Arsenal Grows**

According to the Stockholm International Peace Research Institute (SIPRI), India's nuclear arsenal reached 172 warheads in 2023, slightly surpassing Pakistan's 170 warheads.

- China maintains a larger nuclear arsenal (~500 warheads), with some believed to be on high alert.

#### **Findings on India**

- India is enhancing its nuclear triad with the development of nuclear-powered ballistic missile submarines (SSBNs). The third SSBN, S4, launched in 2021, and a fourth is slated for a 2024 launch.
- These new submarines are significantly larger, indicating increased capability.
- India declared its nuclear triad operational in 2019 with the first SSBN, INS Arihant.
- India is developing long-range missiles, enabling it to target all of China, in addition to Pakistan.

#### **Multiple Warhead Capability**

- In 2023, the Prime Minister announced India's entry into the club of countries capable of delivering multiple nuclear warheads using a single missile.

- It was achieved through the successful test flight of the Agni-V ballistic missile with multiple independently targetable re-entry vehicle technologies under 'Mission Divyastra' by DRDO.
- The SIPRI report noted that India, Pakistan, and North Korea are developing the capability to deploy multiple warheads on ballistic missiles, joining Russia, France, the UK, the US, and recently, China.
- This advancement could rapidly increase deployed warheads and threaten more targets.
- India maintains a "no first use" policy, committing to retaliatory strikes only attack.

### **Nuclear Diplomacy**

- The USA and Russia hold the vast majority of the world's nuclear warheads, with around 5,000 each.
- India was one of the first countries to propose a nuclear test ban treaty and a halt to the production of materials for nuclear weapons.
- India signed and ratified the Partial Test Ban Treaty in 1963.
- The Comprehensive Nuclear-Test-Ban Treaty (CTBT), though not yet in force, remains a key instrument in the UN's efforts to curb nuclear proliferation.

- The suspension of the New START treaty between Russia and the USA and ongoing challenges in arms control highlight the fragile state of nuclear diplomacy.
- The discriminatory nature of the Nuclear Non-Proliferation Treaty (NPT) is seen as a hurdle.
- NATO's nuclear sharing involves US nuclear bombs in Europe, delivered by member states' aircraft during conflicts, distributing nuclear deterrence risks and responsibilities within the alliance.

### **LVM3 M3 re-enters Earth's atmosphere**

- ISRO announced that the cryogenic upper stage of the LVM3 M3/OneWeb India- 2 mission has re-entered the Earth's atmosphere.
- In its sixth consecutive successful flight of LVM3, the vehicle placed 36 satellites belonging to the UK-headquartered OneWeb in their intended orbit.
- Only certain elements like gas bottles, nozzles, and tanks, which comprise materials of very high melting points, were expected to survive the aerothermal heating during the re-entry for this rocket body.
- It complied with international guidelines, such as UN space debris mitigation guidelines, as it was disposed of through natural orbital decay within two years of the orbital injection.



- It also complied with the directives of India's Debris Free Space Missions (DFSM) initiative.

*The **Debris-Free Space Missions (DFSM) initiative** requires space objects operating in the low-Earth orbital region to remain in orbit for less than five years after the end of the mission.*

#### **Exercise Tarang Shakti-2024**

- India will host its first multinational air exercise called Tarang Shakti-2024 in August 2024, with the participation of 10 countries and some others as observers.
- The Indian Air Force's 1st multinational air exercise, Tarang Shakti-2024, will be held in August.
- It is inspired by the Red Flag exercise hosted by the US.
- The exercise will be held in 2 phases, with the first phase in southern India and the second in the western sector.
- Australia, France, Germany, Japan, Spain, the United Arab Emirates, the United Kingdom, and the United States are expected to participate.
- Germany will showcase the A-400M aircraft, which will be displayed for the Indian Air Force (IAF) as it is being considered as a potential option for the current open tender seeking medium transport aircraft.
- Recently, IAF participated in the 2nd edition of air exercise Red Flag 2024 from 4th to 14th June 2024 in Alaska.

- Indian Rafales participated in joint exercises with Singaporean and American aircraft. The missions involved beyond-visual range combat exercises in offensive counter-air and air defence roles as part of large force engagements.
- Objective: The plan is to invite friendly foreign countries with whom the IAF interacts regularly and has a certain degree of interoperability.
- The exercise is now scheduled to be held in two phases. 1<sup>st</sup> to be held in southern and the 2<sup>nd</sup> will be in the western sector.

#### **Pushpak, ISRO's reusable launch vehicle, clears test**

- Recently, the Indian Space Research Organisation (ISRO) completed the third **Reusable Launch Vehicle (RLV) Landing Experiment (LEX)** at the Aeronautical Test Range (ATR) in Chitradurga, Karnataka.
- The experiment successfully showcased autonomous landing capabilities under more demanding conditions.
- **Pushpak** conducted cross-range correction maneuvers and executed a precise horizontal landing at the centerline of the runway.
- The mission simulated high-speed landing scenarios typical of vehicles returning from space. Advanced guidance algorithms were validated for error corrections, crucial for future orbital re-entry missions.

#### **Pushpak Viman**

- **Pushpak RLV** is designed as a fully reusable **single-stage-to-orbit (SSTO)** vehicle, utilizing advanced technology derived from earlier prototypes such as the X-33, X-34, and the upgraded DC-XA.
- *Landing Conditions Simulation*: During the mission, RLV simulated high-speed landing conditions and approaches used when returning from space.
- *Advanced Landing Experiments*: ISRO's second series of RLV landing experiments showcased autonomous landing capability and performed challenging maneuvers with precision.
- *ISRO's Reusable Launch Vehicle Technology Initiative*: This mission is a continuation of ISRO's endeavors to develop critical technologies for a fully reusable launch vehicle (RLV), aimed at achieving cost-effective access to space.
- *Past RLV Missions*: ISRO had previously conducted successful RLV missions in 2016.
- The experiment involved launching a winged spacecraft into space using a rocket powered by ISRO's conventional solid booster engine (**HS9**).

### **Reusable Launch Vehicle**

- An RLV is a spacecraft designed for multiple launches into space, significantly reducing costs by enabling reuse. The concept aims to **recover costly rocket boosters** used in spacecraft launches, potentially refueling and reusing them for future space missions.
- *Operational Aspects by ISRO*: These launch vehicles feature added safeguards like heat shields, grid fins, and other flight control surfaces.

- They are heavier than their expendable counterparts due to extra avionics and propellant. The design of the spaceplane is also tailored to facilitate recovery.
- Advantages: RLV is perceived as a cost-effective, dependable, and readily available means of accessing space.
- Challenges: The selection and crafting of materials such as special alloys, composites, and insulation materials are highly intricate and require skilled manpower.
- Two-Stage RLV Concept: ISRO's RLV features a **two-stage propulsion** system to achieve orbit. After the first stage exhausts its fuel, it is jettisoned, allowing the vehicle to continue using the second stage.
- The separated first stage autonomously re-enters the atmosphere and lands at a predetermined location. Following maintenance, it is ready for reuse.

### **The Space Variable Objects Monitor (SVOM)**

The first astronomy satellite jointly developed by **China and France** named Space Variable Objects Monitor (SVOM) was launched into orbit from the **Xichang Satellite Launch Center in Sichuan Province**, China recently.

- Sino- French Collaboration: The Space Variable Objects Monitor (SVOM) is the first astronomy satellite jointly developed by China and France.
- The two countries had together developed and launched an oceanographic satellite in 2018 also

- Payloads: The satellite is a 930-kg satellite consisting of four payloads, two developed by the French and two by the Chinese.
- The **ECLAIRS** and **MXT telescopes**: Built by France, It will detect and capture the GRBs.
- The Gamma Ray Burst Monitor (GRB): Built by China, It will measure the spectrum of GRBs.
- The Visible Telescope (VT): Developed by China, It will detect and observe visible emissions produced immediately after a GRB.
- Mission Objective: SVOM primarily will look for GRBs across the universe and will measure and study their electromagnetic radiation properties.
- The satellite will also use the bursts to unlock mysteries regarding the evolution of the universe, and gravitational waves, as both gravitational waves and GRBs originate from the collision of neutron stars.

**Significance:**

- Better Detection: As per the Chinese state broadcaster CCTV, SVOM is the most powerful satellite yet that will study the gamma-ray bursts and play an important role in astronomical explorations.
- Early Universe: The SVOM aims to see the earliest **gamma-ray bursts** that took place in the farthest parts of the universe, which will help scientists learn more about the universe's childhood and its evolution.
- Searching for Kilonovas: The SVOM satellite will search for kilonovas as well to study the stellar evolution, and to obtain answers about the origins of heavy elements like gold and silver in the universe

**Gamma Ray Burst:**

- GRBs are bursts of highly energetic gamma rays (the most energetic form of light) which last from less than a second to several minutes.
- Significance for research: GRBs are observed and studied because they carry information pertaining to violent events such as the end of life of massive stars, the formation of black holes in distant galaxies, and how they shape the universe.
- When a GRB erupts, it is briefly the brightest source of cosmic gamma-ray photons in the observable Universe.
- Origin: They are known to occur in distant realms of the universe (resulting from some of the universe's most explosive events such as the birth of black holes and neutron star collisions) and can erupt with a **quintillion** (a 10 followed by 18 zeros) times the luminosity of the Sun.  
**Types: There are two types of GRBs,**
- Short GRBs: They are a result of the collision of either two neutron stars or a neutron star and a black hole, resulting in a black hole and last for less than two seconds
- Kilonovas: Sometimes, short GRBs are followed by kilonovas, ie. It is a blast of electromagnetic radiation that is produced by the **radioactive decay of chemical elements**. The decay can lead to the generation of heavier elements like gold, silver, and platinum.
- Long GRBs: They are produced due to the explosive deaths of massive stars. These can last for two seconds or longer.

**Recently, the Australian government has signed an \$18-million memorandum of understanding (MoU) with the Indian Space Research Organisation's (Isro's)**

- As part of the deal with NewSpace India Limited (ISRO's commercial arm), Australian company Space Machines will launch a satellite aboard **ISRO's SSLV in 2026**
- This deal is **India's first cross-border investments in the space sector since it was privatised in 2020.**

**New Space India Limited (NSIL)**

- It was incorporated in 2019, as a **wholly-owned Government of India Undertaking** / Central Public Sector Enterprise (CPSE), under the administrative control of the Department of Space (DOS) to commercially exploit the research and development work of Indian Space Research Organisation (ISRO).

**Potential of India's Space Sector:**

- **Indian National Space Promotion and Authorization Centre (IN-SPACe)** unveiled the decadal vision and strategy for the Indian space economy
- As per IN-SPACe's projection, India's space economy has the **potential to reach ₹35,200 crore (\$44 billion) by 2033** with about **8%** of the global share.

- At present Indian space economy is valued at around **₹6,700 crore** (\$8.4 billion) with a **2% share** in the global space economy.
- Export market share is ₹2,400 crore (\$0.3 billion)
- *Aim:* To increase the domestic share to ₹26,400 crore (\$33 billion), and the export share to ₹88,000 crore (\$11 billion).
- An investment of ₹17,600 crore (\$22 billion) is envisioned in the next 10 years

#### **IN-SPACe**

- It is the single-window, autonomous, nodal agency under the Department of Space. The decadal vision and strategy has been developed by IN-SPACe and ISRO along with other stakeholders.

#### **Privatisation Of Space Sector:**

- *Indian Space Policy 2023:* It formally laid down the regulations for privatising space missions in India, and also denoted clear guidelines of operations for **NewSpace India Limited (Nsil) — Isro's commercial arm** and **Indian National Space Promotion and Authorization Centre (IN-SPACe)**.
- Private startups can communication thus offer satellite services, operate on-ground mission control centres, place their own satellites in orbit, establish and commercially-run privately-owned remote satellite services,



undertake space safety projects, and also “engage in the commercial recovery of an asteroid resource or a space resource.”

- India is opening its space sector to foreign investment: Government hints that India **will allow 100% foreign direct investment** in the manufacture of satellite systems without official approval
- Eased the rules for launch vehicles aiming for a greater share of the global space market.
- This will give India access to the latest tech advances and much-needed funds, not only from the country but from international investors too.
- SSLV's privatisation is still underway: Bidders have been identified, but a final decision is yet to be taken. Once completed, SSLV will be manufactured and operated by the private sector.

**Advantages Of Privatisation:**

- *Reduces ISRO's burden*: Private participation will free up ISRO to concentrate on science, research and development, interplanetary exploration, and strategic launches.
- India's private space economy has attracted **\$370 million** in investments to date, with Hyderabad-based space launch vehicle provider **Skyroot Aerospace** leading the pack at \$95 million.
- Space economies progress: Going forward, the gap between the strategic and civilian space industries is decreasing. This will be of help as our space economies progress.

- Policy Framework and Goals: The Private Sector participation will help India increase its share in the global space economy from about 2 per cent to 9 percent by 2030, according to a recent report by Deloitte India.
- The **Indian Space Policy 2023** provides a framework that prioritizes private players' involvement in the space sector.

### **Challenges to Space Sector in India**

- Lack of internal demand is hurting the sector :India's space economy has a dearth of commercial space projects from the central government and its agencies.
- Lack of Capacity Building
- While Isro has the **LVM-3 as its heaviest rocket**, we need more capacity and capability to be able to carry our futuristic projects like reaching lunar orbit and land back on Earth.
- Access to insurance: There also is a lack of adequate and secured insurance, which is because of the inability of insurers to see and test the reliability of space-based technologies in the recent past
- Ability to create self-sustaining markets: An inability to forge self-sustaining commercial markets in the past puts into question the commercial viability of space-based enterprises.
- For Instance, Two decades ago, the commercial satellite business was expected to achieve independence within a few years of being established, but government involvement is still needed to this day to see projects to the execution phase.

### **Small Satellite Launch Vehicle (SSLV)**

- It is a **3 stage** Launch Vehicle configured with **three Solid Propulsion Stages** and liquid propulsion based **Velocity Trimming Module (VTM)** as a terminal stage.
- SSLV is 2m in diameter and 34m in length with lift off weight of ~120 tonnes.
- SSLV is capable of launching **~500kg satellite in 500km planar orbit.**
- Key features of SSLV: Low cost, with low turn-around time, flexibility in accommodating multiple satellites, Launch on demand feasibility, minimal launch infrastructure requirements, etc.

### **High Speed Expendable Aerial Target 'ABHYAS' successfully completes developmental trials.**

Recently, the **Defence Research and Development Organisation (DRDO)** has successfully completed six consecutive developmental trials of High Speed Expendable Aerial Target (HEAT) 'ABHYAS' in Chandipur, Odisha.

#### ABHYAS:

- It is a **High Speed Expendable Aerial Target (HEAT).**
- It has been designed by DRDO's **Aeronautical Development Establishment**, Bengaluru, and developed through Production Agencies - **Hindustan Aeronautics Limited & Larsen & Toubro.**

#### Features

- It offers a realistic threat scenario for weapon systems practice.

- This indigenous system is designed for autonomous flying with the help of an **autopilot**, a **laptop-based Ground Control System** for aircraft integration, pre-flight checks, and autonomous flight.
- It also has a feature to record data during flight for post-flight analysis.
- The booster has been designed by Advanced Systems Laboratory and the navigation system by Research Centre Imarat.

Key Facts about DRDO

- It was formed in **1958** from the amalgamation of the then-existing **Technical Development Establishment (TDEs)** of the Indian Army and **the Directorate of Technical Development and Production (DTDP)** with the **Defence Science Organisation (DSO)**.
- It is the *R&D wing of the Ministry of Defence, Govt. of India*, with a vision to empower India with cutting-edge defence technologies and a mission to achieve self-reliance in critical defence technologies and systems.
- It has a network of laboratories engaged in developing defence technologies covering various fields, like aeronautics, armaments, electronics etc.
- Headquarters: New Delhi.

**INTERNATIONAL RELATIONS**

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

Colombo Process:

- It is a **Regional Consultative Process** and it provides an important platform for consultations on the management of overseas employment and contractual labour for countries of origin in Asia.
- It serves as a forum for the exchange of best practices on overseas employment.
- Membership:
- It comprises 12 Member States of Asia (countries of origin of migrant workers).
- Members: **Afghanistan, Bangladesh, China, Cambodia, India, Indonesia, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Vietnam.**
- India has been a member of the Colombo Process since its **inception in 2003.**
- Objectives:
- Share experiences, lessons learned and best practices in labour migration management.
- Consult on issues faced by migrants, countries of origin, and countries of destination, and propose practical solutions for the well-being of overseas workers.
- Optimize development benefits from organized overseas employment and enhance dialogues with countries of destination.
- Review and monitor the implementation of the recommendations and identify further steps of action.

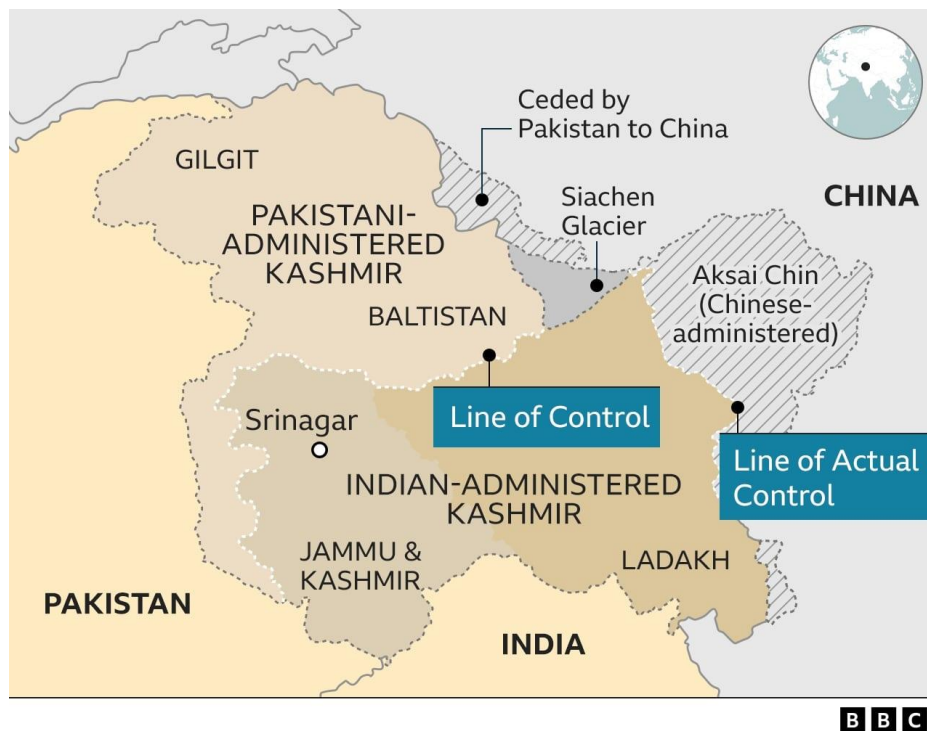
- The process is **non-binding**, and decision-making is by consensus.
- The process is coordinated through the **Permanent Missions of Member States at the United Nations in Geneva.**
- The process is governed by **Ministerial Consultations** wherein recommendations and action plans are discussed and adopted by the Ministers of the participating countries.
- The **International Organization for Migration (IOM)** has provided technical support to the Colombo Process since its inception and serves as its Secretariat.
- There are five Thematic Area Working Groups (TAWGs):
  - Skills and Qualification Recognition (chaired by Sri Lanka);
  - Fostering Ethical Recruitment (chaired by Bangladesh);
  - Pre-Departure Orientation and Empowerment (chaired by Philippines);
  - Remittances (chaired by Pakistan);
  - Labour Market Analysis (chaired by Thailand)

**Pakistan admitted in court that Pakistan-occupied Kashmir (PoK) is a "foreign territory".**

Pakistan Occupied Kashmir (PoK):

- PoK was **illegally occupied by Pakistan in 1947** following an invasion by **Pashtun tribesmen and the Pakistani Army.**
- Historically part of the **princely state of Jammu and Kashmir**, which acceded to India in 1947 after Partition.

- **Geographical Extent:** Covers an area of 13,297 sq km with a population of over **40 lakh**. It includes 10 districts, with the capital being **Muzaffarabad**.
- Comprises two ethnically and linguistically different regions: **Mirpur-Muzaffarabad region** and **Gilgit-Baltistan region**.
- In 1963, Pakistan ceded over 5,000 sq km of this land to China in the **Shaksgam** area.
- **Administrative Status:** Neither PoK nor GB are listed as part of Pakistan's four provinces. Both are considered "**autonomous territories**" ruled directly from Islamabad.
- For India, PoK and GB are part of the state of Jammu and Kashmir, which is an integral part of the country as per the 1994 Parliamentary resolution.



India-Pakistan Territorial Demarcation:

- **International Border (IB):** Stretches approximately 2,400 km from Gujarat to the north banks of Chenab in Akhnoor in Jammu.
- **Line of Control (LoC):** A ceasefire line that came into existence after the **1948 and 1971** wars between India and Pakistan, delineated in the Simla Agreement (1972).
- **Actual Ground Position Line (AGPL):** Divides the current positions of Indian and Pakistani troops in the Siachen region and extends from **NJ 9842 to Indira Col** in the north.
- Further demarcation challenges include the IB in **Sir Creek area** and International Maritime Boundary line between India and Pakistan, which have not been demarcated.

**The inaugural United Nations Global Supply Chain Forum, organized by UN Trade and Development (UNCTAD) and the Government of Barbados, concluded successfully recently.**

UN Global Supply Chain Forum:

- It was the inaugural edition of the forum, which was held from May 21 to 24, 2024, in Barbados.
- It was hosted by **UN Trade and Development (UNCTAD)** in collaboration with the Government of Barbados.



- Over 1,000 participants from around the world convened to tackle the pressing issues of global disruptions, geopolitical tensions, climate change, and the COVID-19 pandemic and their impact on global trade.
- It gathered key figures, including trade and transport Ministers from several small island developing states (SIDS).
- Representatives from various UN agencies ,major ports like the Port of Seattle, and industry leaders in shipping and logistics were also present.
- The forum underscored the complexities and opportunities in decarbonizing global shipping, with a particular focus on developing countries rich in renewable energy resources.
- Efforts to incentivize low- or zero-carbon fuels, establish safety frameworks for new fuels, and enhance port readiness for handling various fuels were identified as critical steps in driving sustainable freight transport and logistics.
- One of the major outcomes of the forum was the launch of the **“Manifesto for Intermodal, Low-Carbon, Efficient and Resilient Freight Transport and Logistics.”**
- This manifesto calls for a significant transformation in freight transport to achieve global climate targets and improve socio-economic resilience, emphasizing the transition to zero-emission fuels, optimized logistics, and sustainable value chains.

- Digital technologies were highlighted as key to enhancing global supply chain resilience.
- Ministers from **SIDS** advocated for international financial support and investment in green and sustainable technologies to enhance energy efficiency and combat marine pollution.
- A significant achievement of the forum was the launch of the **UN Trade and Development Trade-and-Transport Dataset**, developed in collaboration with the **World Bank**.
- This comprehensive repository provides global data on over 100 commodities and various transport modes, offering a holistic view of trade and transport costs.
- The next forum is set to take place in **Saudi Arabia in 2026**.

**The Indian delegation participated in the inaugural Indo-Pacific Economic Framework for Prosperity (IPEF) Clean Economy Investor Forum.**

*Indo-Pacific Economic Framework for Prosperity (IPEF):*

- It is an **economic initiative** launched by the United States President on May 23, 2022.
- It has **14 members**: Australia, Brunei, Fiji, India, Indonesia, Japan, South Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, United States and Vietnam.

- This framework is intended to advance resilience, sustainability, inclusiveness, economic growth, fairness, and competitiveness for member economies.
- The forum seeks to go beyond traditional free trade agreements and work on the issues of supply chains, **clean energy, decarbonization,** infrastructure and tax and anti-corruption.
- **Four pillars of cooperation:** Trade, Supply Chain, Clean Economy, and Fair Economy.
- **India is not part of the trade pillar.**

Clean Economy Investor Forum:

- The **IPEF Clean Economy Investor Forum** is one of the initiatives under the **IPEF**.
- It brings together the region's top investors, philanthropies, financial institutions, innovative companies, startups and entrepreneurs. The forum aims to mobilize investments into sustainable infrastructure, climate technology and renewable energy projects.
- The **Department of Commerce** is the nodal agency for the IPEF engagements, and the IPEF Clean Economy Investor Forum is managed by **Invest India**, the country's national investment promotion agency.

**India, South Korea, the United States, Japan, and the European Union (EU) have formed a Biopharmaceutical Alliance to address drug supply shortages during the COVID-19 pandemic.**

Biopharmaceutical Alliance:

- It was launched in response to the drug supply shortages experienced during the Covid-19 pandemic.
- The announcement was made at the inaugural meeting of the Biopharmaceutical Alliance, held in **San Diego, California**, during the **Bio International Convention 2024**, the world's largest biopharmaceutical exhibition.
- The initiative originated from discussions between **South Korea and the U.S.** and expanded to include Japan, India, and the EU.

Aim of the Alliance:

- The alliance aims to coordinate bio policies, regulations, and research and development support measures among participating countries.
- Emphasized the importance of a reliable and sustainable supply chain.

Free equitable and fair drug supply ensures:

- Access to essential medicines for all populations.
- Availability of affordable treatments, especially in developing countries.
- Equitable distribution of medications, reducing disparities in healthcare.
- Promotion of public health by addressing global health challenges.
- Supports disease prevention, treatment, and eradication efforts worldwide.

India as pharmacy of the world:

- India has earned the title "**Pharmacy of the World**" due to its **robust generic pharmaceutical industry**, supplying affordable and quality medicines globally. This reputation grew during the HIV/AIDS pandemic

when Indian companies provided affordable **antiretroviral drugs to African countries**. India's generic industry became a major supplier after the establishment of the Global Fund to Fight AIDS, Tuberculosis, and Malaria.

India's Vaccine Diplomacy:

- **Widespread Vaccine Access:** India ensures COVID-19 vaccines are globally accessible.
- **IPR Waiver:** Proposes a WTO waiver on intellectual property rights to make vaccines more affordable.
- **Major Supplier:** Becomes a significant vaccine supplier, notably through partnerships with Serum Institute of India (SII) and Bharat Biotech International Ltd.
- **Neighbourhood Focus:** Implements a "Neighbourhood First" policy, prioritizing vaccine assistance to South Asian countries.
- **Global Assistance:** Provides vaccine aid to African countries and UN health workers through COVAX.

Significance of India's Vaccine Diplomacy:

- **Development Partnership:** Reflects India's long-standing commitment to global health and development.
- **Commercial Terms:** Exports vaccines on commercial terms to upper-middle-income countries.
- **Diplomatic Relations:** Restores strained relations, as seen with Canada, through vaccine diplomacy.
- **Countering Vaccine Nationalism:** India's sharing policy contrasts with the trend of vaccine hoarding by other nations.

- **Global Health Diplomacy (GHD):** Positions India as a key player in GHD, contributing to peace, equity, and global health security.

**Pakistan, Somalia, Denmark, Greece and Panama were elected as non-permanent members of the UN Security Council for a two-year term beginning in 2025.**

The five members were elected by a secret ballot in the UN General Assembly for a two-year term starting on January 1, 2025, until December 31, 2026

UNSC Council Elections:

- The United Nations Security Council is a **15 member body** consisting of **five permanent members** (China, France, Russian Federation, United Kingdom of Great Britain and Northern Ireland and United States of America) and **10 non-permanent members** elected by the General Assembly for a term of two years.
- **Rule 142 of the rules of procedure:** The United Nations General Assembly has to **elect each year five non-permanent members** of the Security Council based on the following pattern,  
**Five from African and Asian States**
  1. One from Eastern European State
  2. Two from Latin American States
  3. Two from Western European and other States.

- **Election:** The members are elected by a secret ballot with **2/3 majority** and there are **no nominations**.
- **Re-election:** The rule 144 of the rules of procedure states that, a retiring member is not eligible for immediate re-election
- India's tenure as non-permanent member in UN
- India has been a non permanent member of the UN Security Council for **eight terms** (a total of 16 years), with the most recent being the 2021–22 term.

*Significant achievements:*

- **Historical concerns:** India was at the forefront in the fight against **colonization, apartheid and racial discrimination**.
- **Drafting of the Universal Declaration of Human Rights:** India was an active contributor in Drafting the **Universal Declaration of Human Rights** with Dr. Hansa Mehta, leading the Indian delegation.
- She highlighted the need for reflecting gender equality by changing the language of the Declaration from 'all men are created equal' to 'all human beings'.
- In 1953, the chief delegate of India at the time, **Vijaya Lakshmi Pandit** was elected the **first woman President** of the UN General Assembly
- India is the largest force contributor to the **global peacekeeping missions**.

*India's achievements during its presidential term in 2021:*

- **Concept of Maritime Security:** The 2021 UNSC presidency marked a comprehensive debate on the holistic concept of maritime security with a presidential statement on maritime security prepared.
- **Peacekeeping:** India also exchanged a Memorandum of Understanding (MoU) with the UN in support of **the 'Partnership for Technology in Peacekeeping'** initiative and to UN C4ISR Academy.
- **Resolution in Peacekeeping:** India drafted a resolution on peacekeeping focused on ensuring accountability for crimes against peacekeepers, sponsored by 80 member states, including all 15 members of the UNSC.
- **UNITE aware platform:** India launched the UNITE Aware technology platform to strengthen real-time protection of peacekeepers.

**At least 49 migrants died and 140 others were missing after their boat capsized off the coast of Yemen, the U.N. migration agency said on June 11.**

The latest tragedy comes on the back of two separate shipwrecks on the same route along the coast of **Djibouti**, claiming the lives at least 62 migrants.

- There has been a sharp rise in migrants travelling from the **Horn of Africa to Yemen**, spurred by political and economic instability, alongside severe droughts and other extreme weather events in countries like **Ethiopia and Somalia**.
- Despite the ongoing conflict in Yemen, thousands of migrants continue to transit through the country in hopes of reaching Saudi Arabia and neighbouring nations.

*The International Organization of Migration (IOM):*



- The IOM is an intergovernmental organization that provides services and advice concerning migration to governments and migrants, including internally displaced persons, refugees, and migrant workers.
- **Establishment: IOM was established in 1951.**
- **Headquarters: Geneva**, Switzerland.
- **Member States:** IOM has **175 member states** and 8 observer states.
- **Mandate:** To promote humane and orderly migration for the benefit of all, through providing services and advice to governments and migrants.
- **Publications: World Migration Report, Migration Health Annual Report.**
- Key Areas of Work:
- **Migration and development:** IOM works to maximize the benefits of migration for both the home and host countries, as well as for migrants themselves.
- **Migration health:** The organization provides health services and support to migrants and displaced populations.
- **Emergency operations:** IOM responds to humanitarian crises by providing emergency relief and post-crisis recovery programs, such as transportation assistance, temporary shelter, and rebuilding infrastructure.
- **Counter-Trafficking:** The organization actively combats human trafficking through prevention, protection, and prosecution initiatives, providing support to victims of trafficking.

United Nations High Commissioner for Refugees:

- **The Office of the United Nations High Commissioner for Refugees** was established on **December 14, 1950** by the **United Nations General Assembly**.

- The agency is mandated to lead and co-ordinate international action to protect refugees and resolve refugee problems worldwide.
- Its primary purpose is to safeguard the **rights and well-being of refugees**. It strives to ensure that everyone can exercise the right to seek asylum and find safe refuge in another State, with the option to return home voluntarily, integrate locally or to resettle in a third country. It also has a mandate to help **stateless people**.

**Beijing is deploying cognitive tools like simulated audio visuals against Taiwan to demonstrate its ability to fight and win a future war.**

Grey Zone Warfare:

- **Grey Zone Warfare** is a new, **emerging battlefield-centric** concept defined as the use of coercive measures to exploit the operational space between peace and war.
- These measures deliberately stay below a threshold so as not to prompt a conventional military response to alter the status quo, which otherwise would have been attracted.
- **Origin:** Its beginning is attributed to the **Cold War era** from **1945** when the development of nuclear weapons meant direct conflicts had to be restrained as the cost of conventional conflict had grown too steep and the risk of escalation too profound.
- **Methods:** Grey Zone Warfare is characterized by subthreshold activities, including kinetic and non-kinetic methods by conventional military force and irregular proxies.

- **Kinetic:** It is the use of proxies for on-ground action or change of territorial status quo through **coercion or militarisation of disputed features**.
- Example: China's action in the **South China Sea** or **Russia's invasion of Crimea**
- **Non-kinetic:** These are provocative activities ranging from **nefarious economic activities**, influence operations, and cyberattacks to mercenary operations, assassinations, disinformation campaigns, economic actions such as debt traps and sanctions, **election meddling**, etc.

Prime Objective:

- **Escalation Bait:** The aggressor country's small actions could be designed as bait for the other party to escalate, which would then give the aggressor a free hand to respond in kind, legitimized as a form of self-defense.
- **Projection of strength:** The countries often show off their abilities. They also aim to normalise disputed territorial claims by repeatedly marking a presence in those regions.

Techniques Used by China against Taiwan

- **Cognitive Warfare:** The People's Liberation Army Eastern Theater Command (PLA ETC) **Weibo** account recently released a 3D animation video depicting an invasion scenario of Taiwan's areas in Taipei and Kaohsiung with land warship-based ballistic missile launchers.
- **Sustained Military Pressure:** China has maintained sustained pressure on Taiwan's defense and Intelligence forces since 2020, with daily sorties conducted by PLA fighter jets, unmanned aerial vehicles (UAVs), strategic fighters, and early warning aircraft inducing wear-out within Taiwanese forces.

- **Intelligence Gathering:** The UAVs are deployed to conduct intelligence work in the areas surrounding the island.
- **Ideological and Psychological Warfare:** Beijing often pushes narratives within Taiwanese territory that thrust ideological choices upon its citizens by initiating public discussions on social media and garnering attention for the Chinese cause.
- **Economic warfare:** China has taken coercive economic measures, leveraging the cross-strait trade and business interdependence to seek concessions.
- Example: China has **unilaterally suspended** the preferential tax rates for chemical imports from Taiwan, granted under the **Economic Cooperation Framework Agreement (ECFA)**, as a retaliation against Mr. Lai's propagation of "separatist" sentiments.

### 50th G7 Summit

- Prime Minister Narendra Modi attended the G7 Summit in Puglia, Italy.
- **G7 Summit: Agenda**
- **Ukraine war:** With a view to supporting Ukraine's current and future needs in the face of a prolonged defense against Russia, the G7 will launch **Extraordinary Revenue Acceleration (ERA)** Loans for Ukraine, in order to make available approximately **\$50 billion** in additional funding to Ukraine by the end of the year.
- **Stopping the war in Gaza:** The G7 will also focus on the Middle East, particularly the Gaza conflict. The US President has proposed a plan for an immediate ceasefire between Israel and Hamas.

- **Migration:** Italy wants Europe to help reduce illegal migration from Africa. Under the Mattei plan, significant investments in African infrastructure, development, and energy have been planned.
- **Climate change:** The G7 aims for a **40-42 percent** emission reduction by 2030, but current policies suggest only a **19-33 percent** reduction is likely. It will explore new strategies to meet climate goals.
- The G7 nations have committed to promote concrete infrastructure initiatives such as the **India-Middle East-Europe Economic Corridor (IMEC)** and **PGII (Partnership for Global Infrastructure and Investment) initiatives.**
- **Importance of the Indo-Pacific for G7:** The Indo-Pacific is of strategic significance, particularly for Japan, the only G7 member located in the region.
- **What is the G7 Summit?**
- **The G7 originated** from a 1973 meeting of finance ministers and central bank governors.
  - This meeting was convened in response to major economic challenges of at time –an oil crisis, rising inflation and collapse of the Bretton Woods system.
- **The first Summit** of Heads of State and Government was held in **1975 in Rambouillet, France.**
- **Members:** France, United States, United Kingdom, Germany, Japan, Italy, and Canada, and the European Union.
- The formation of G7 served **two purposes;**
  - **First,** to address economic, political and security differences and manage crises among the members.

- **Second**, to reinforce the dominance of the Western democratic and liberal economic model in the global order.
- The G-7 does **not have a formal constitution** or a **fixed headquarters**. The decisions taken by leaders during annual summits are **non-binding**.
- **Timeline**
- **Canada** joined the group in **1976**, and the European Union began attending in 1977.
- The G-7 was known as the '**G-8**' for several years after the original seven were joined by Russia in 1997.
  - The Group returned to being called G-7 after **Russia was expelled** as a member in 2014 following the latter's **annexation of the Crimea** region of Ukraine.

#### **Why has India been invited?**

- With a GDP of **\$3.94 trillion**, India boasts an economy larger than four G7 members.
- India plays a crucial role in the **Indo-Pacific region** countering Chinese dominance.

#### **How relevant is it today?**

- The G-7's share of global GDP is around **47%** and only five—the US, Germany, Japan, UK, and France—are among the top 7 global economies, while Italy and Canada have been upstaged by China and India.

#### **India refuses to endorse Ukraine meet statement**

Recently, India underscored that achieving peace requires proposals acceptable to both Russia and Ukraine, and therefore chose to disassociate

from the final document issued on June 16 at the conclusion of the Peace Summit in Switzerland.

### **Ukraine Peace Summit in Switzerland**

- **Key Highlights of the Ukraine Peace Summit in Switzerland:**
- *Attendance and Endorsement:* More than 80 countries participated in the summit and endorsed the “Joint Communique on a Peace Framework.” The communique emphasised the importance of protecting Ukraine’s territorial integrity, based on Ukraine’s peace formula and the principles of the UN Charter.
- *Non-Endorsing Countries:* India, Saudi Arabia, South Africa, Thailand, Indonesia, Mexico, and the United Arab Emirates did not sign the communique. Brazil attended as an observer, while China declined the invitation to participate.
- *India’s Participation and Stance:* India attended the summit but chose not to endorse the final document. India’s stance is based on the principle that any peace proposal must be acceptable to both Russia and Ukraine for it to be sustainable. The Ministry of External Affairs (MEA) reiterated India’s commitment to understanding diverse perspectives and pursuing a resolution through dialogue and diplomacy.

### Russia's Annexations in Eastern Ukraine

Territory under Russian control as of Sept. 2023

Kharkiv

Kherson, Zaporizhzhia, Donetsk, and Luhansk were annexed on September 30, 2022.

LUHANSK

Luhansk

DONETSK

Donetsk

Dnipro

Zaporizhzhia

Tokmak

Mariupol

Mykolaiv

Odesa

Kherson

KHERSON

ZAPORIZHZHIA

SEA OF AZOV

RUSSIA

CRIMEA

BLACK SEA

0 100 km 0 100 mi

Source: Institute for the Study of War and American Enterprise Institute.

COUNCIL on FOREIGN RELATIONS

#### Why did India Refuse?

- *Neutrality and Balanced Approach:* India adheres to a policy of neutrality and balanced diplomacy in international conflicts. By abstaining from taking



sides in the Russia-Ukraine conflict, India aims to maintain positive diplomatic relations with both nations.

- *Emphasis on Mutually Acceptable Solutions:* India believes that sustainable peace can only be achieved through proposals that are mutually acceptable to both Russia and Ukraine. This approach underscores India's commitment to promoting dialogue and practical engagement between the conflicting parties.
- *Strategic and Diplomatic Considerations:* By refraining from endorsing the communique, India preserves its potential role as a trusted mediator in international disputes. This stance helps safeguard its strategic partnerships, particularly with Russia, and takes into account broader geopolitical concerns such as food and energy security.
- Hence, India's decision underscores its commitment to neutrality, advocating for peace proposals acceptable to both Russia and Ukraine. It aims to preserve diplomatic relations and safeguard strategic interests amidst evolving global geopolitical dynamics.

### **Initiative on Critical and Emerging Technology**

National Security Advisors of India and U.S. **discuss iCET, defence ties, and regional security**, focusing on emerging technologies and partnerships.

- They chaired the second meeting of the **initiative on Critical and Emerging Technology (iCET)**.

#### **iCET**

- It was announced by India and USA on the **sidelines of the Quad Summit** in Tokyo in **2022** and was launched by the **NSAs in 2023**.

- It comprises **key technology sectors** such as space, semiconductors, advanced telecommunications, artificial intelligence, quantum, biotechnology, and clean energy.
- Subsequently, **new areas were included:** biotechnology, critical minerals and rare earths processing technologies, digital connectivity and digital public infrastructure and advanced materials.

**Key takeaways include:**

- setting up a research agency partnership to drive collaboration in areas like AI;
  - developing a new defence industrial cooperation roadmap to accelerate technological cooperation for joint development and production;
  - developing common standards in AI;
  - developing a roadmap to accelerate defence technological cooperation and 'innovation bridge' to connect defence startups;
  - supporting the development of a semiconductor ecosystem;
  - strengthening cooperation on human spaceflight;
  - advancing cooperation on development in 5G and 6G;
  - and adopting OpenRAN network technology in India.
- **Progress Made so Far**
  - The two countries have already put in place the **Quantum Coordination Mechanism**, launched a public-private dialogue (PDD) on telecommunication to drive collaboration in OpenRAN, 5G and 6G.

- Both countries signed an MoU on establishing a **semiconductor supply chain** that paved the way for creating a semiconductor sub-committee to review recommendations from an industry-led task force launched in connection with the iCET.
- A new initiative to advance cutting-edge technology cooperation, known as the **India-U.S. Defence Acceleration Ecosystem (INDUS-X)** was launched.
- India and the U.S. have also concluded a **roadmap for 'Defence Industrial Cooperation'** to guide the policy direction for the next few years.
- The two countries have also established a **Strategic Trade Dialogue** to remove regulatory "barriers" and review existing export control norms to take forward strategic technology and trade collaborations envisaged under iCET.

#### **Significance**

- **Depth to the relationship:** iCET could lend a new strategic depth and breadth to the expanding engagement between India and the United States.
- **Against the rising and assertive China:** Lending urgency to the iCET is the growing convergence of Indian and US interests in managing the security, economic, and technological challenges presented by a rising and assertive China.
- **Reducing dependence on Russia:** India is also looking to reduce its over-dependence on Russian weapons and military technology and to produce more weapons at home in partnership with western countries.

#### **Conclusion**

- Both the NSAs express optimism that the initiative will achieve more specific and tangible results in the near future.

### India-Italy Strategic Partnership

Prime Minister Narendra Modi met his Italian counterpart with a focus on a free and open Indo-Pacific and India-Middle East-Europe Economic Corridor.

Both the leaders reviewed the progress of the bilateral strategic partnership and agreed to strengthen cooperation in global fora and multilateral initiatives, including the India-Middle East-Europe Economic Corridor.

#### India-Italy Strategic Partnership

- India and Italy elevated their Relations into **Strategic Partnership in 2023**.
- Italy is the next country in Europe after France, Germany and The Netherlands, to be taking a keen interest in engagements in the Indo-Pacific region and a gradual upswing in its ties with India is an **important part of its recent Indo-Pacific pivot**.
- In 2021, the **'India-Italy-Japan' trilateral was launched**, with an aim to work towards the security, stability, prosperity and multilateralism of the Indo-Pacific region.
  - It is the second trilateral that India has, in the Indo-Pacific region, involving a European country, after the 'India-France-Australia' trilateral.
- **Global Forums:** Italy joined both the significant initiatives, launched on the margins of the G20 Summit, the **'Global Biofuel Alliance'** and the **'India-Middle East-Europe Economic Corridor'**.
  - Italy has also joined the **'International Solar Alliance' (ISA)**, in 2021, which was the year of the Italian Presidency of G20 and co-Presidency of COP26.

- **Bilateral trade** between India and Italy has substantially increased; it was estimated at 4.9 billion Euros in 2022, with a 42% growth over 2021.
  - Italy is the fifth largest trading partner of India in the EU.
  - Italy, which is looking at supply chain consolidation and diversification in its post-pandemic recovery, sees India as an important partner in the region.
- The two countries are looking forwards to strengthen **cooperation in defence technology, maritime security and space**, with similar concerns in maritime domain.
- **Relations with China:** At the same time, there is also Italy's growing concern about China in the broader European and Indo-Pacific region.
  - There are reports about Italy's intention to exit China's BRI. In case this happens, it will be a significant policy shift for Italy.
  - Geopolitical necessities are resulting in Italian policy makers, shaping and reshaping their relationships in Asia.

### **Way Ahead**

- Recent developments show that there is a renewed interest in the relationship from both sides.
- India and Italy can leverage their strategic positions in the Indian Ocean and in the Mediterranean, respectively, to promote connectivity, stability, energy security, freedom of navigation in the two maritime geographies, and therefore in the wider Indo-Pacific region.

## 2nd meeting of India-Cambodia on Trade

The recent meeting of the India-Cambodia Joint Working Group on Trade and Investment (JWGTI) highlighted several areas of mutual interest and potential collaboration.

### Key Points on Meeting

- **Cooperation in Traditional Medicine:** Both nations explored opportunities for collaboration in traditional medicine, aiming to leverage shared knowledge and practices.
- **Bilateral Investment Treaty:** Both countries discussed the framework for a bilateral investment treaty to promote and protect investments, providing a stable and predictable investment environment.

### Pharmaceutical Sector:

- **Recognition of Indian Pharmacopoeia:** India sought recognition of its pharmacopoeia in Cambodia, which would facilitate the export of Indian pharmaceutical products.
- **UPI-Based Payments:** Progress on collaboration in Unified Payment Interface (UPI) based digital payments was reviewed. This initiative aims to promote trade and tourism by facilitating seamless and secure transactions.
- **Trade Enhancement:** Measures to enhance trade value and volume, facilitate trade expansion, and promote investment were discussed. Both sides agreed on the importance of increased interaction for achieving mutual benefits.
- **Key Facts: Cambodia**

- **Capital:** Phnom Penh
- **Boundaries:** Cambodia is located in the southeastern part of the Indochina Peninsula in Southeast Asia, it is bordered by Vietnam to the east and south, Laos in northeast, Thailand in west/northwest, and by the Gulf of Thailand in west.
- **Geographical Features:** Cambodia's landscape is characterized by a low-lying central alluvial plain that is surrounded by uplands and low mountains and includes the Tonle Sap (Great Lake) and the upper reaches of the Mekong River delta.
- **Mekong Ganga Cooperation(MGC) initiative:** Under the Mekong Ganga Cooperation(MGC) initiative, India helped in the establishment of the Asian Traditional Textile Museum at Siem Reap. The museum, one of its first kind in Cambodia, was completed in December 2011.

**Russia and North Korea recently signed the “Treaty on Comprehensive Strategic Partnership”.**

- The pact between Russia and North Korea talks about cooperation on a wide range of issues, such as Nuclear energy, Space exploration, Food, and energy security, and mutual military support and unspecified technological assistance.
- A crucial part of the deal is the **mutual defence provisions**.

*Historical Context*

- **After World War II:** Erstwhile Soviet Union wanted the installation of a communist regime in Korea, and offered significant military assistance to **North Korea founder Kim Il Sung** during the Korean War
- **Two nations solidified their alliance in 1961:** Signing of the **Russo-North Korea Treaty of Friendship, Cooperation and Mutual Assistance**, which like the latest pact contained a mutual defence agreement.
- After the dissolution of the Soviet Union in 1991: Treaty was voided and relations temporarily deteriorated.

The Russia-North Korea Pact

- **Mutual defence provisions:** In case any one of the two sides is put in a state of war by an armed invasion from an individual state or several states, the other side shall provide military and other assistance with all means in its possession without delay in accordance with Article 51 of the UN Charter and the laws of the DPRK and the Russian Federation

This provision echoes the 1961 agreement between the two nations.

- Article 51 of the UN Charter
  - It provides for the right of a member country to take individual or collective self-defence actions.



Implications of the Pact on the Global World-

- **Perceived Security Threat For Others:** For South Korea and Japan, this treaty is likely to be perceived as a direct security threat.
- Both countries have long been concerned about North Korea's nuclear program and military strength.
- **Deterrence:** This will likely push both countries to strengthen their defences and rethink their security policies.
- **Japan:** It has already abandoned its long-standing pacifist foreign policy and is building its military might.
- **South Korea:** It has convened an emergency meeting of its national security council in response and said it will now consider sending arms to Ukraine, something which it had thus far resisted.
- **Increasing Dependence On USA:** Both South Korea and Japan are likely going to cement their alliance with the United States further in order to strengthen their strength
- **Strengthens The Anti-West Bulwark In Asia:** Russia-North Korea pact could also encourage similar partnerships elsewhere, most notably with Iran
- **China Is Likely To Be Conflicted About The Development:** China would be wary of Russia's growing military collaboration with North Korea, which could undermine its near-exclusive geopolitical influence over Pyongyang.
- It would also be concerned about a greater Western footprint in Asia as a result of this development.

**International Criminal Court (ICC) issued arrest warrants for former Russian Defence Minister and current Chief of Staff of the Armed Forces for “alleged international crimes” linked to the Russia-Ukraine war.**

Last year, an ICC warrant for war crimes was also issued for Russian President Vladimir Putin.

Dozens of countries don't accept the court's jurisdiction over war crimes, genocide and other crimes.

- They include Israel, the United States, Russia, Qatar and China.
- India is **not a member state** of the ICC, and has never signed its core treaty, the '**Rome Statute**'.

Article 12(3) of the Statute:

- If the acceptance of a state that is not a party to the statute is required, the state may accept the jurisdiction of the court for a crime concerned, by making a declaration to the Registrar and cooperating without any delay or exception.
- Ukraine: Not a State Party to the Rome Statute, but it has twice exercised its options to accept ICC's jurisdiction over alleged crimes under the Rome Statute, occurring on its territory, under Article 12(3) of the Statute.

Putin's Arrest Warrant:

- Last year, the ICC issued a warrant for Russian President Vladimir Putin on charges of responsibility for the abductions of children from Ukraine.
- Russia responded by issuing its own arrest warrants for ICC prosecutors and judges.

- *Arrest of Leaders:* If Putin or the two leaders travel to a state party to the ICC, then that country must arrest them, according to its obligations under international law.
- This move will likely further deepen Russia's isolation from the West.

**The Rome Statute of the International Criminal Court:**

- It is the treaty that established the **International Criminal Court (ICC)**. The ICC is an intergovernmental organization with 123 member states.
- It is Headquartered at **Hague, Netherland**
- It was adopted in July 1998 and entered into force in July 2002.
- It is a permanent court of last resort to prosecute individuals responsible for the world's most heinous atrocities — war crimes, crimes against humanity, genocide and the crime of aggression.
- It intervenes only when national authorities cannot or will not prosecute.
- The ICC is **independent** of the United Nations (UN), but is endorsed by the UN General Assembly.
- It also maintains a cooperation agreement with the UN.
- Unlike the **International Court of Justice (ICJ)**, which is an *organ of the UN*, the ICC does not prosecute states.

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

*Small Island Developing States (SIDS)*

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

UN Programmes of Action in Support of SIDS:

- **Barbados Programme of Action (BPoA), 1994:** It prescribed specific actions that would enable SIDS to achieve sustainable development.
- **The Barbados Declaration** is a statement of political will underpinning the commitments contained in the BPoA.
- **Mauritius Strategy, 2005:** The Mauritius Strategy for further implementation of the BPoA was adopted to address remaining gaps in implementation.

- **SAMOA Pathway, 2014:** It recognizes the adverse impacts of climate change and sea-level rise on SIDS' efforts to achieve economic development, food security, disaster risk reduction and ocean management, among other challenges.

Global Environment Facility & SIDS:

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

**ECONOMY**

**Reserve Bank Of India's Variable Repo Rate auction sees huge response by banks suggesting an increased demand for liquidity in banking sector.**

Banks submitted bids worth ₹1,13,915 crore, significantly exceeding the RBI's offer of ₹50,000 crore.

- **Liquidity Deficit:** It is estimated that liquidity in the banking system is in deficit to the tune of around ₹1.54-lakh crore.

Call Money Rate:

- Call Money Rate is the rate at which short term funds are borrowed and lent in the money market.

- Duration: **1 day is the duration of the call money loan.**
- Participants: RBI, banks, primary dealers participate in the call money market.

Function:

- Banks resort to these type of loans to fill the asset liability mismatch, comply with the statutory CRR and SLR requirements and to meet the sudden demand of funds.
- Demand and supply of liquidity affect the call money rate. A tight liquidity condition leads to a rise in call money rate and vice versa.

Variable Rate Repo Auction:

- Also called Term Repo Rates, It is a liquidity injection tool of the RBI for liquidity management in the economy.
- **Current situation:** The RBI has been conducting VRRs to inject liquidity on a temporary basis into the banking system since december 2023
- In mid-January, the tenor of the **VRR was increased to 14 days** to match the CRR cycle for steady State injection. Further to this, it has been conducting short-dated VRRs (1-7day) periodically to 'fine tune' market liquidity.
- **VRR Auctions:** They are conducted by the RBI, when the weighted average call money rate trends above the repo rate in the interbank money market, serving as a signal to the RBI of System Liquidity Deficit.
- **Tenure:** It is a short term liquidity injection against collaterals with a tenor of Overnight to 13 days usually.

- But, for injection of durable liquidity, the RBI conducts VRR auctions for a tenor beyond 14 days very rarely.
- **Rate of Interest:** It generally is borrowed at a rate decided by market generally lower than Repo Rate (though not less than Reverse Repo Rate).  
*Other strategies to Infuse liquidity:*
- The Target is to let interbank liquidity enter into a surplus by July.
- **RBI Transfers:** RBI has transferred to the government ₹2.1 trillion as a dividend coupled with the cancellation of weekly treasury bill auctions of ₹60,000 crore.
- **RBI's Foreign Exchange intervention:** The FX strategy of RBI is the main driver of interbank liquidity.
- FPI accounts have resumed buying India Government Bonds (IGBs), though in small sizes for now.
- **Inflows:** Inflows from GOI redemptions, interest payments and lower T-bill issuance will also start.

**Reserve Bank of India's annual Report 2023-24 highlights India's stagnant millet acreage and production.**

India grapples with stagnation in both acreage and production of millets, according to Reserve Bank of India's annual report for 2023-24.

*What is Millet?*

- It is a collective term referring to a number of **small-seeded annual grasses** that are cultivated as grain crops, primarily on marginal lands in dry areas in temperate, subtropical and tropical regions.
- Some of the common millets available in India are **Ragi (Finger millet), Jowar (Sorghum), Sama (Little millet), Bajra (Pearl millet), and Variga (Proso millet)**.
- The earliest evidence for these grains has been found in **Indus civilization** and was one of the first plants domesticated for food.
- It is grown in about 131 countries and is the traditional food for around 60 crore people in Asia & Africa.
- India is the **largest producer of millet** in the world.
- It accounts for **20% of global production and 80% of Asia's production**.
- Global Distribution:
- India, Nigeria and China are the largest producers of millets in the world, accounting for more than 55% of the global production.
- For many years, India was a major producer of millets. However, in recent years, millet production has increased dramatically in Africa.
- Reasons for Stagnant Millet Production:
- **Incentives for alternative cereals:** The Indian **government's MSP** (minimum support price) schemes promote the cultivation of fine cereals over millets.
- **Consumer preferences:** There's a visible shift in consumer choices favoring fine cereals, contributing to reduced millet cultivation.



- **Global comparison of productivity:** India's millet productivity stands at **1.4 tonnes per hectare**, which is **lower** compared to China (**3 tonnes/ha**), Ethiopia (**2.5 tonnes/ha**), and Russia (1.5 tonnes/ha).
- **Yield gap challenges:** The comprehensive cost of cultivation survey (CCCS) for 2021-22 highlights a significant yield gap in millet production, indicating a potential for improvement.
- **Dependence on rainfall:** Millet yield, especially **bajra**, **heavily relies on rainfall** due to its predominant cultivation under rain-fed conditions.
- **Lack of irrigation:** Despite being drought-resistant, millets would benefit from minimal but assured irrigation to help close the yield gap.
- **Factors affecting yield gap:** Labor, fertilizer, and machine usage are found to be negatively and significantly related to the yield gap, while the adoption of hybrid seeds shows a positive impact on yields.

**As per the data by Department for Promotion of Industry and Internal Trade (DPIIT) FDI inflows in 2023-24 contracted by 3.49% to \$44.42 billion compared to 2022-23.**

**Key Highlights:**

- *FDI Inflows:*
- FDI inflows in 2023-24: **\$44.42 billion**, a decline of **3.49%** from \$46.03 billion in 2022-23.
- Total FDI (including **equity inflows, reinvested earnings, and other capital**): Declined by 1% to \$70.95 billion from \$71.35 billion in 2022-23.
- **Highest ever FDI inflows: \$84.83 billion in 2021-22.**
- *Quarterly Performance:*

- **January-March FY24:** FDI inflows rose by 33.4% to \$12.38 billion from \$9.28 billion in the same period the previous year.
- *Top Sectors for FDI:*
- **2023-24 Top Sectors:** Computer Software & Hardware, Service Sector, and Construction Activities.
- **2000-2024 Top Sectors:** Services Sector, Computer Software & Hardware, Trading, Telecommunications, and Automobile Industry.
- *Top Recipient States in 2023-24:*
- **Maharashtra:** Highest with \$15.1 billion, up from \$14.8 billion in 2022-23.
- **Gujarat:** \$7.3 billion, up from \$4.7 billion in 2022-23.
- **Karnataka:** Declined to \$6.57 billion from \$10.42 billion in 2022-23.
- Growth also recorded in Tamil Nadu, Telangana, and Jharkhand.
- Decline observed in Delhi, Rajasthan, Uttar Pradesh, and Haryana.
- *Top Source Countries:*
- **2023-24 Top Sources: Singapore, Mauritius, and USA.**
- 2000-2024 Top Sources: Mauritius, Singapore, USA, Netherlands, and Japan.
- Decreased Inflows: From countries like Mauritius, Singapore, US, UK, UAE, Cayman Islands, Germany, and Cyprus.
- Increased Inflows: From Netherlands and Japan.

**Second Advance Estimates of 2023-24 for Area and Production of Horticultural Crops**

The **Department of Agriculture and Farmers Welfare** has issued the Second Advance Estimates for horticultural crop production for the fiscal year 2023-24.

Key Highlights:

- Total horticultural production for 2023-24 is estimated at **352.23 million tonnes**.
- This represents a decrease of 32.51 lakh tonnes (0.91%) from the previous year 2022-23.
- The categories of crops included in the horticultural sector are Fruits, Honey, Flowers, Plantation Crops, Spices, Aromatics & Medicinal Plants, and Vegetables.
- Production Trends for Specific Horticultural Crops:
- **Increase in production observed in:**
  - Fruits such as Banana, Lime/Lemon, Mango, **Guava**, and Grapes.
  - Vegetables including Bottlegourd, Bittergourd, Cabbage, Cauliflower, Pumpkin, **Tapioca**, Carrot, and Tomato.
- Other categories like Honey, Flowers, Plantation Crops, Spices, Aromatics & Medicinal Plants.
- **Decrease in production noted in:**
  - Vegetables such as Onion, Potato, Brinjal, and Other Vegetables.
- **Specific Crop Production Estimates:**
  - **Onion:** Projected decrease in production by about 60 lakh tonnes from the previous year's 302.08 lakh tonnes.

- **Potato:** Expected reduction in production by about 34 lakh tonnes, mainly due to decreased production in Bihar and West Bengal.
- **Tomato:** Anticipated increase in production by 3.98% from the previous year's 204.25 lakh tonnes.

**Recently, SEBI introduced a framework on “financial disincentives” that targets market infrastructure institutions.**

- **New Provision:** Under this framework, there is a provision for imposing penalties ranging from ₹1 lakh to ₹1 crore for each surveillance lapse during the financial year.
- The new framework will be applicable from July 1.

Market Surveillance:

- Market surveillance involves **preventing and investigating** abusive, manipulative, or **illegal trading practices** in securities markets.
- **Purpose:** It ensures orderly markets by fostering confidence among buyers and sellers in the fairness and accuracy of transactions.
- **Significance:** Effective market surveillance is crucial for maintaining market order, encouraging investment, and supporting economic growth.
- **Providers:** Both the private sector and the public sector can perform market surveillance activities.

Market Surveillance by MIIs:

- Surveillance by **Market Infrastructure Institutions (MIIs)** is to continuously monitor the security market. It provides crucial information that aids the regulator in enforcing market rules and regulations.

- Their responsibilities include:
- Day-to-day monitoring of market activities.
- Reporting abnormal or suspicious activities.
- Surveillance Lapse Monitoring the conduct of market intermediaries.
- Generating and processing alerts.
- Seeking trading rationale.
- Carrying out snap analysis
- Surveillance lapse:
- A **surveillance lapse** includes any failure observed in carrying out surveillance activities.
- The activities **include inadequate** or **non-reporting** of these activities according to agreed timelines.
- It also includes the partial or delayed execution of any surveillance-related SEBI decision or communication.

Penalty Structure for Surveillance Lapses Under new framework:

- **First Instance:**
- MIIs with annual revenue < ₹300 crore: Penalty of ₹1 lakh.
- MIIs with annual revenue > ₹1,000 crore: Penalty of ₹25 lakh.
- **Second Instance:**
- Penalty ranges from ₹2 lakh to ₹50 lakh, based on the annual revenue.

- **Third Instance and Beyond:**

- Penalty ranges from ₹4 lakh to ₹1 crore, based on the annual revenue.

Impact of Market Surveillance Lapse:

- **Trust and Confidence:** Lapses in market surveillance of the Securities Market can erode investor trust and confidence in the securities market.
- **Manipulative practices:** Market surveillance lapses can cause rise in manipulative practices, leaving the market vulnerable.
- **Unfair playing:** lapses of market surveillance can create an unfair playing field for investors.

Exceptions of new Framework:

- New framework of SEBI is not Applicable When:
- The lapse has a broad market impact.
- The lapse results in significant investor losses.
- The lapse compromises market integrity on a large scale

**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.**

Pump and Dump Scheme:

- In the stock market, a pump and dump scheme is a type of **manipulation activity** that involves **artificially inflating the price of a stock** through false and misleading information, only to sell the stock at the inflated price and leave investors with significant losses.

- It is particularly prevalent in the **micro-cap** and **small-cap sectors**, where companies often have limited public information and trading volumes are lower.  
*How does pump and dump work?*
- First, a significant amount of stock in a relatively small or thinly traded company is acquired. These stocks are often referred to as '**penny stocks**' because they trade at low prices and are more susceptible to price manipulation due to low trading volumes.
- Then the stock is aggressively promoted to create a buzz and attract investors. This promotion can take various forms, including sending out mass emails or newsletters with exaggerated claims about the company's prospects, as well as misleading social media posts. Promoters aim to create buzz and drive interest in the stock.
- As the promotion gains traction, more investors buy into the stock, driving up its price due to increased demand. Sometimes, fraudsters may also engage in coordinated buying to further boost the price. During this phase, the stock often experiences rapid and significant price increases, creating the illusion of a hot, high-potential investment.
- Once the stock price has been pumped up sufficiently, the sell-off begins at the inflated prices. This selling pressure causes the stock price to plummet, often leaving unsuspecting investors with significant losses as the stock returns to its actual value or even lower.
- *Impact:*

- Those who bought into the hype and purchased the stock at inflated prices typically face substantial losses when the stock price crashes.
- These schemes undermine confidence in the financial markets, making legitimate investors wary of potential fraud.
- Under the SEBI guidelines, **pump and dump schemes are completely banned.**

**Recently, the RBI proposed establishing a Digital Payments Intelligence Platform.**

- RBI Proposes to Set Up a 'Digital Payments Intelligence Platform' to Mitigate Payment Fraud Risks
- The RBI has created a committee led by **Shri A.P. Hota**, former MD & CEO of NPCI.
- The committee will explore different aspects of setting up this **digital public infrastructure.**

Digital Payments Intelligence Platform:

- Digital Payments Intelligence Platform is an initiative by the RBI
- **Objective:** To enhance the security and reliability of digital payments, boost consumer confidence, and mitigate fraud risks.
- **Need of this platform:** RBI wants to improve the existing e-mandate system because more people are using **automatic recurring payments.**

Features:



- **Technology Integration:** The platform will leverage advanced technologies to counteract fraud.
- The e-mandate system will now cover regular payments but not always at fixed times.
- For Example, This includes topping up Fastag balances for tolls or the **National Common Mobility Card (NCMC)** used in public transport.
- **Integration Plan:** RBI plans to include UPI Lite in the **e-mandate system** to make it more popular among users.

*Benefits of Digital Payments Intelligence Platform:*

- Reduced Fraud and Increased Consumer Confidence
- **Real-time data sharing:** By enabling real-time data exchange across the network, the platform can quickly identify suspicious patterns and transactions.
- This allows authorities to take quicker action and prevent fraudulent activities before they occur.
- **Improved detection capabilities:** Advanced analytics on the platform can help identify emerging fraud techniques and develop more robust countermeasures.
- This will make it harder for fraudsters to exploit loopholes in the system.
- **Increased consumer trust:** With a more secure environment, consumers will be more confident using digital payments, leading to wider adoption and growth of the digital economy.
- 2. Automated Top-ups for Convenience

- **Benefit for Customers:** People can set their Fastag and NCMC to refill automatically when their balance drops below a chosen level.
- **Ease of Use:** This makes paying for travel and transportation simpler and faster.
- 3. Enhanced Efficiency and Convenience:
- **Streamlined fraud resolution:** Faster identification of fraudulent transactions will lead to quicker resolution for victims, minimizing inconvenience and financial loss.
- **Improved regulatory oversight:** The platform can give regulators a centralized view of digital payments.
- It allows them to develop more effective policies and regulations.
- **Innovation Potential:** The platform can act as a foundation for future innovations in the digital payments space, fostering the development of new secure and convenient payment methods.

**The Central Board of Indirect Taxes and Customs (CBIC) recently started automatic electronic payment of duty drawback amounts directly into exporters' bank accounts.**

*Duty Drawback Scheme:*

- It is a trusted and time-tested scheme administered by CBIC to promote exports.
- It rebates the incidence of Customs and Central Excise duties, chargeable on imported and excisable material, respectively, when **used as inputs for goods** to be exported.

- The duty drawback provisions are described under the **Customs Act, 1962**.
- This WTO compliant scheme ensures that exports are **zero-rated** and do not carry the burden of the specified taxes.
- It is a crucial program to help exporters offset some of the costs accrued during the export process, particularly in the supply or value chain.
- The following are the eligible goods for the duty drawback:
  - To export goods imported into India
  - To export goods imported into India after having been taken for use
  - To export goods manufactured/produced out of imported material
  - To export goods manufactured/produced out of indigenous material
  - To export goods manufactured /produced out of imported or indigenous materials.
- The following are the minimum criteria to claim for processing drawback claims:
  - Any individual must be the legal owner of the goods at the time the goods are exported.
  - He/she must have paid **customs duty** on imported goods.
- Duty drawback is available on most goods on which customs duty was paid on importation and which has been exported.

Central Board of Indirect Taxes and Customs (CBIC):

- CBIC (erstwhile Central Board of Excise and Customs) is a part of the **Department of Revenue** under the Ministry of Finance, Government of India.
- CBIC administers all the **indirect tax-related** matters in India.
- It deals with the tasks of formulation of policy concerning levy and collection of **Customs, Central Excise duties, Central Goods & Services Tax and IGST**, prevention of smuggling and administration of matters relating to Customs, Central Excise, Central Goods & Services Tax, IGST, and **Narcotics to the extent under CBIC's purview.**
- The Board is the administrative authority for its subordinate organizations, including Custom Houses, Central Excise and Central GST Commissionerates, and the Central Revenues Control Laboratory.
- It also ensures that taxes on foreign and inland travel are administered as per the law, and the collection agencies deposit the taxes collected to the public exchequer promptly.

**India and the US informed the World Trade Organization (WTO) that they have reached a mutually agreed solution on the outstanding dispute .**

- To begin with, this dispute was filed more than a decade ago, relating to certain import restrictions taken by India against the imports of poultry products from the U.S. on grounds of avian influenza or bird flu.
- This dispute marked one of the earliest instances where animal, and human health and safety-related measures, broadly referred to as **'sanitary**

**and phytosanitary (SPS) measures'** initiated by a developing WTO member was brought before a WTO panel.

- The U.S.'s primary contention was that India, in deviating from internationally recognised standards set by the World Organization for Animal Health (formerly the OIE), failed to provide scientific justifications for its poultry measures, as mandated by the WTO's SPS Agreement.

SPS Agreement:

- The Agreement on the Application of **Sanitary and Phytosanitary Measures (SPS Agreement)** is a treaty of the **World Trade Organization (WTO)** that came into force with the establishment of the WTO on January 1, 1995.
- It sets out the basic rules for food safety and animal and plant health standards.

Key Provisions:

- **Scientific basis:** SPS measures must be based on scientific principles and sufficient evidence, except for provisional measures.
- **Harmonization:** Members are encouraged to align SPS measures with international standards set by bodies like **Codex Alimentarius, OIE, and IPPC**.
- **Equivalence:** SPS measures of other countries should be accepted as equivalent if they achieve the same level of protection.
- **Risk assessment:** Countries must conduct risk assessments to determine the appropriate level of protection, considering the impacts of pests or diseases.

- **Regionalization:** Members should recognize pest- or disease-free areas and areas of low prevalence, even if within a single country or group of countries.
- **Transparency:** Countries must notify changes in SPS measures and provide regulatory information through the WTO's SPS notification system.
- **Dispute Resolution:** These disputes can be taken to the **WTO's Dispute Settlement Body (DSB)** if consultations fail.

**The Health Ministry and the IRDAI are working together to launch the National Health Claim Exchange (NHCX).**

- **Recently, the Health Ministry and the Insurance Regulatory and Development Authority of India (IRDAI)** are working together to launch the **National Health Claim Exchange (NHCX).**

National Health Claim Exchange:

- NHCX, created by the **National Health Authority (NHA)**, is a digital platform aimed at streamlining the sharing of claims-related data among stakeholders in the healthcare and health insurance sectors.
- **Interoperability:** NHCX is built to be interoperable, machine-readable, auditable, and verifiable. This guarantees the accuracy and reliability of the shared information, promoting transparency and enhancing efficiency in processes.
- **Centralized Hub:** It serves as a single platform for all health claims, alleviating administrative burdens on hospitals that currently manage various portals for different insurers.
- **Adoption and Incentives:** The National Health Authority has introduced financial incentives to promote the adoption of digital health transactions.

- Starting January 2023, hospitals receive ₹500 per claim or 10% of the claim amount, whichever is lower, for transactions conducted through the NHCX.
- These incentives aim to encourage widespread use of the platform and the digitization of patient health records.

Benefits of NHCE:

- **Enhanced Efficiency and Transparency:** National Health Claim Exchange endeavours to standardise data presentation and validation, fostering a consistent approach to healthcare pricing and claims processing.
- **Decreased Administrative Burden:** Hospitals will enjoy a simplified, paperless, and secure contractual structure, simplifying interactions with insurers.
- **Rapid Processing of Cashless Claims:** A stipulated time frame mandates that cashless claims be processed within three hours of discharge authorization, ensuring prompt service for patients.
- **Data Insights:** Insurance firms can utilize aggregated data and analytics regarding claims trends, patterns, and outcomes to develop improved products and services.
- **Online Tracking:** Beneficiaries have the ability to monitor their claim status online, access their claim history, and receive prompt updates on claim settlements.
- **Monitoring of Performance:** Hospitals can track their claims performance, pinpoint areas for enhancement, and compare their performance with others.

- **Comprehensive Oversight:** Regulators acquire a thorough and dependable information source regarding the health insurance sector in India.
- **Streamlined Processes:** Promotes the digitalization of health transactions and offers financial incentives through the **Digital Health Incentive Scheme (DHIS)**.
- **Advantages:** The platform's objectives include expediting claim settlements, cutting administrative expenses, deterring fraud, and enhancing customer contentment. Additionally, it offers valuable data for policy making, regulatory purposes, and research.

Challenges and Solutions:

- **Enhancing Cooperation:** Strengthening the collaboration between hospitals and insurance companies is essential. Both must upgrade their IT systems and provide workforce training to ensure effective implementation.
- **Minimising Discharge Delays:** It is crucial to address discharge delays and miscommunication between hospitals and insurers to facilitate smoother operations.
- **Ensuring Data Security:** Protecting data from breaches is a critical aspect of the ongoing development of NHCX.

Insurance Regulatory and Development Authority of India (IRDAI):

- The Insurance Regulatory and Development Authority of India (IRDAI) is a **statutory body** established under the **Insurance Regulatory and Development Authority Act, 1999**, tasked with the overall supervision and development of the insurance sector in India.
- **Objectives:** Ensure the interests and fair treatment of policyholders



- Oversee the insurance sector to ensure its financial stability and fairness.
- Regularly develop regulations to ensure the industry operates clearly and without ambiguity.
- **Headquarters:** Located in Hyderabad.

Entities Regulated by IRDAI:

- **Life Insurance Companies:** Includes both public and private sector companies.
- **General Insurance Companies:** Comprises both public and private sector companies, including standalone health insurance companies that offer health insurance policies.
- **Re-Insurance Companies:** Regulated to ensure compliance with industry standards.

**An analysis by the Household Consumption Expenditure Survey (HCES) shows that consumption inequality in the rural areas of 11 states has increased.**

- **Consumption Inequality** Increased in Rural Areas of 11 States
- The **Gini coefficient** of total consumption expenditure saw an increase between the periods 2011-12 and 2022-23 as per the survey in rural areas.
- 11 out of 25 states taken for analysis, recorded an increase in the Gini Coefficient value.
- **Rural Areas:** The rise in Gini coefficient was the sharpest in **Nagaland (0.244 from 0.192)**, followed by Jharkhand (0.255 from 0.206),

Maharashtra (0.291 from 0.253), Rajasthan (0.283 from 0.248), Meghalaya (0.223 from 0.19) and Chhattisgarh (0.266 from 0.234).

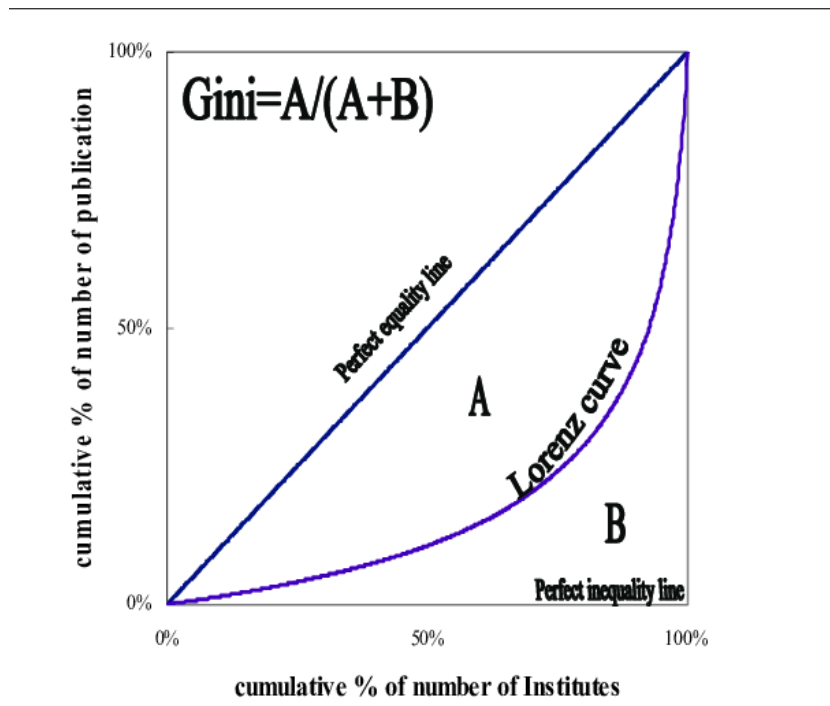
- **Urban Areas:** The Gini coefficient for consumption expenditure has also risen in urban areas for three states ie. Meghalaya (0.266 from 0.226), Himachal Pradesh (0.311 from 0.29) and Manipur (0.221 from 0.209).
- **National Trend:** At the country level, The Gini coefficient of total consumption expenditure recorded a general decline showing a **decline in spending inequality** in the country.
- The Gini coefficient has gone down to 0.266 in 2022-23 from 0.283 in 2011-12 (rural areas). For urban areas, it has gone down to 0.314 from 0.363 during the same period.

*The Household Consumption Expenditure Survey (HCES)*

- The HCES survey is designed to collect information primarily on consumption of goods and services by the households and also collects some auxiliary information on household characteristics and their demographic particulars.
- **Purpose:** The Information collected in HCES is useful for understanding the consumption and expenditure pattern, standard of living and well-being of the households.
- The data is used for preparation of the weighting diagram for compilation of official Consumer Price Indices (CPIs).

**Conducted by: The National Sample Survey Office (NSSO)**

- **Survey Coverage:** The survey is an All India exercise. Information has been collected from 8,723 villages and 6,115 urban blocks covering 2,61,746 households (1,55,014 in rural areas and 1,06,732 in urban areas) in total.
- **The consumption basket:** The Items basket has been divided into three broad categories, namely, Food items, Consumables and Services items, and Durable goods in HCES: 2022-23.



The Gini Coefficient:

- The Gini Index determines a nation's level of income inequality by measuring the income distribution or wealth distribution across its population.
- **Developed by:** The Gini index was developed in 1912 by Italian statistician **Corrado Gini**.

- Scale: Gini coefficient measures inequality on a scale of 0 (or 0%) to 1 (or 100%), with **0 representing perfect equality and 1 representing perfect inequality**.
- **World Bank ranking: South Africa** has the world's worst level of income inequality, with a **Gini index ranking of 63.0%** and **Norway** had the lowest level of income **inequality, at 22.7%**.
- India has a Gini Coefficient of **32.8** as per the World Bank in 2021.
- Graphical Representation: The Gini index is often represented graphically through the **Lorenz curve**.

### India's Informal Sector Recovery

According to findings of the **National Sample Survey Office (NSSO)**, India's large **informal non-agricultural sector** has recovered gradually that was badly hit by the second wave of the COVID-19 pandemic.

- It plays a crucial role in driving economic activity, providing livelihoods to millions, and contributing significantly to the country's GDP.
- A high proportion of socially and economically underprivileged sections of society are concentrated in informal economic activities, which is characterised by its flexibility, adaptability, and ability to absorb a large portion of the workforce.
  - India with almost **85% informal labour** is generating more than **half of the country's GDP**.
- From small-scale manufacturing to services such as domestic work and construction, the sector contributes substantially to national income and serves as a safety net for many households.

- The **informal sector** encompasses a vast majority of **non-agricultural jobs in India**.

#### **National Sample Survey Office(NSSO)**

– It is responsible for conducting **large scale sample surveys** in diverse fields on an **All India basis**.

a. Primarily data are collected through **nation-wide household surveys** on various socio-economic subjects, Annual Survey of Industries (ASI), etc.

– Besides these surveys, NSSO collects **data on rural and urban prices** and plays a significant role in the improvement of crop statistics through supervision of the area enumeration and crop estimation surveys of the State agencies.

#### **Divisions of NSSO**

- Survey Design and Research Division (SDRD)
- Field Operations Division (FOD)
- Data Processing Division (DPD)
- Survey Coordination Division (SCD)

#### **Key Findings of NSSO**

- **Post-Pandemic Rebound:** The informal non-agricultural sector in India, which suffered during the second COVID-19 wave, saw a recovery with a 6% increase in firms and an 8% rise in employees by the second half of 2022-23.
- **Financial Improvement:** There was a 9.83% growth in Growth in Gross Value Added (GVA) at current prices from October 2022 to March 2023 compared to the fiscal year 2021-22.

- **Significant Job Creation:** From October 2022 to March 2023, there was a notable increase in informal firms and employment, with other services and manufacturing sectors leading the job growth.
  - In 2022-23, there were approximately 65 million such enterprises employing around 110 million workers and contributing significantly to the GVA of the nation.
- **Statistics Ministry Release:** The survey data contributes to national account statistics, highlighting the unincorporated non-farm sector's role in job generation and economic value.
- **Challenges Faced by the Informal Sector**
- **Lacking Contract and Social Security Benefits:** NSSO data reveals that nearly three-quarters of these jobs are informal, with 80% of employees lacking a written contract and 72% without social security benefits.
  - One of the primary issues is the lack of formal recognition and support, leading to **limited access to credit, social security benefits, and healthcare.**
- Informal workers often endure precarious **working conditions** and are **vulnerable to economic shocks**, which can adversely affect their livelihoods and overall well-being.
- **Tax Evasion:** Because the informal economy's firms are not directly regulated, they typically dodge one or more taxes by concealing revenue and expenses from the legal system.
  - It is a problem for the government because a large portion of the economy is not taxed.
- **Lack of formal Data for Policy Making:** There are no official statistics available that reflect the true state of the economy, making it difficult for the

government to formulate policies affecting the informal sector in particular and the economy as a whole.

- **Policy Interventions and Government Initiatives**
- Recognizing the importance of the informal sector, successive governments have introduced various policies and initiatives aimed at promoting its growth and integration into the formal economy.
- Programs such as the **National Rural Livelihoods Mission (NRLM)** and **Skill India Mission** seek to enhance the skills and productivity of informal workers, thereby improving their earning potential and socio-economic status.
- Additionally, **financial inclusion** schemes like **Jan Dhan Yojana** have facilitated greater access to banking services for individuals operating in the informal sector, and **Pradhan Mantri Garib Kalyan Yojana (PMGKY)** provided relief to vulnerable sections, offering a safety net during the crisis.
- Strengthening infrastructure, facilitating technology adoption, and simplifying regulatory frameworks are also crucial for enabling sustainable growth and integration into the formal economy.

### Digital Agri Mission

The Union government will announce a Rs 2,800 crore **Digital Agriculture Mission**.

- – The agricultural sector, which is estimated to constitute **18 percent of India's GVA in FY24**, is the bedrock of the

nation's economy.

a. India ranks **second-largest producer of fruits**, vegetables, tea, farmed fish, sugarcane, wheat, rice, cotton, and sugar.

The horticulture production was 355.25 million tonnes which is the highest ever for Indian Horticulture (as per third advance estimates).

- **The Mission**

- Digital Agriculture Mission will pave the way for creation of a nationwide farmers registry, crop sown registry, and georeferencing of village maps.
- A budgetary allocation of Rs 28,00 crore has been made for the mission and it will be rolled out over the next two years (till 2025-26).
- The launch of the mission was initially planned in 2021-22 but due to Covid-19 outbreak, it could not be rolled out nationally.

- **Components**

- One of the components of the mission is to create a farmers' registry, in which every farmer will be given a unique ID
- The mission also envisages a crop sown registry.
  - This will have a record of crops sown by a farmer on his land.
  - It will help better planning and estimation of crop production.

- **Progress**

- A pilot project has been undertaken across 6 districts — Farrukhabad in Uttar Pradesh, Beed in Maharashtra, Gandhinagar in Gujarat, Fatehgarh Sahib in Punjab, and Virudhunagar in Tamil Nadu.
  - Uttar Pradesh and Maharashtra have already started generation of farmers' ID.



- The unique farmer ID will allow launch of new value-added services and farmers will be able to avail various government schemes including PM-Kisan and Fasal Bima Yojana through this ID.
- It will also enable them to avail financial services like farm loans and insurance.

- **Importance**

- The adoption of digital technologies can help India to increase agricultural productivity, reduce waste, increase agricultural export, increase farmers' income and improve food and nutrition security.
- Apart from this, this will help in protecting the environment and sustainable development of the overall agricultural sector.
- Artificial Intelligence (AI) will be a tool for farmers to detect crop anomalies , predict the weather, analyse soil quality, and provide required solutions
- Therefore, The Digital Agriculture Mission aims to encourage and speed up projects based on cutting-edge technologies, including AI, blockchain, remote sensing, robots, and drones.

- **Challenges**

- There is a lack of a centralized repository for agricultural data, posing challenges for startups and organizations developing AI solutions.
- AI solutions require sensors, mechanization for precision farming and connectivity none of which are viable for a majority of Indian farmers.
- Finally, concerns of farmer data privacy and safeguards over who can access personal data need to be addressed in the solution architecture.

- **Other related steps**

- The Union government has also launched **AI programmes** assisting agriculture and **Kisan e-Mitra**, an AI-powered chatbot that assists people regarding the PM Kisan Samman Nidhi scheme.
- **The National Pest Surveillance System** uses AI to detect crop issues, enabling timely intervention for healthier crops.
- **Agricultural mechanisation** – During the period from 2014-15 to December, 2023 an amount of Rs 6405.55 crore has been allocated for agricultural mechanisation.
  - From within the funds of **Sub-Mission on Agricultural Mechanization (SMAM)**,
  - So far an amount of Rs 141.41 crores have been released towards **Kisan drone promotion**
- **National e-Governance Plan in Agriculture (NeGPA)**: NeGPA aims to achieve rapid development in India through use of Information & Communication Technology (ICT) for timely access to agriculture related information for the farmers.
- The launch of the digital platforme-**NAM (National Agriculture Market)** in 2016 has facilitated the integration of Agriculture Produce Marketing Committees (APMC) mandis and has provided multi-faceted benefits to farmers, farmer-producer organisations (FPOs), buyers, and traders
- **Conclusion and Way Forward**
- Digital agriculture has excellent potential in India to resolve many of the existing problems that farmers face to realise value and provide strong competition in national and global markets.
- Its success will depend on policy and legal enablers along with significant public private partnerships.

- Realising the AI potential requires the establishment of an AI-ready ecosystem equipped with ethical frameworks, robust data-sharing mechanisms, an effective risk management protocols
- Given the direction that the union and various state governments have taken in recent times along with the booming growth of agri-startups in the country, India is on the right path to transforming its agricultural sector and providing accelerated value to all farmers.

### Corporate Social Responsibility (CSR)

Recently, the Securities and Exchange Board of India (SEBI) has sent a proposal to the government to amend Corporate Social Responsibility (CSR) rules in the Companies Act (2013) to include donations made by companies through **Social Stock Exchanges (SSEs)**

- Current CSR rules mandate companies **to spend at least 2% of their average net profit** over the last three years **on any social welfare activities** listed in the Companies Act, 2013.
  - All organisations listed on SSEs operate in the same domains of social welfare mentioned in the Companies Act, 2013.
- **Currently**, companies can donate to non-profit organisations **outside of SSEs under their CSR activities**.
  - They **cannot**, however, fund non-profit organisations through SSEs to fulfil their CSR mandate.
- For the above, **an amendment in Schedule VII of the Companies Act (2013)** is required.

- **Schedule VII of the Act** lists the activities that companies undertake for CSR.

- **Securities and Exchange Board of India (SEBI)**

- It was constituted as a **non-statutory body** in 1988 **through a resolution** of the Government of India.
- **Later**, Parliament of India passed the **Securities and Exchange Board of India Act in 1992**, and established it as a **statutory body**.
- **Objective:** To protect the interests of investors in securities and to promote the development of, and to regulate the securities market and for matters connected therewith or incidental thereto.

- **Social Stock Exchanges (SSEs)**

- It was proposed by the Union Finance Minister in the **FY20 Budget Speech**, as a **segment under stock exchanges** where **non-profit organisations that work for social welfare** can be registered and listed to raise funds.

a. Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE) both run Social Stock Exchanges (SSEs).

b. **Currently**, as many as eight non-profit organisations are listed on the NSE SSE, and it is believed that the SSEs would have more than **100 listings by the end of FY25**.

### **GST Council**

- The Goods and Services Tax (GST) Council is likely to consider a review of 28% tax on online gaming.
- **GST Council**

- The Goods and Services Tax (GST) Council is a constitutional body established under Article 279A of the Indian Constitution through the 101st Amendment Act of 2016.
- The Union Finance Minister is the Chairperson of the GST Council.
- The GST Council makes recommendations to the Union and the States on key GST-related issues, including:
  - Taxes, cesses, and surcharges to be subsumed under GST
  - Goods and services to be subject to or exempt from GST
  - Model GST laws, principles of levy, and apportionment of IGST
  - Tax rates, thresholds, special provisions, and any other matter relating to GST
- **Dispute resolution:** The Council also serves as a platform to resolve disputes between the Centre and the States or among the States themselves on GST-related matters.
- The Centre has **one-third of the total voting power**, while the States collectively have two-thirds.
- A recent Supreme Court ruling has clarified that the recommendations of the GST Council are not binding on either Parliament or state legislatures.

- The Prime Minister granted certificates to more than 30,000 women from Self Help Groups (SHGs) as Krishi Sakhis.
- This certification course aligns with the objectives of the 'Lakhpati Didi' Program.
- The Krishi Sakhi Convergence Program (KSCP) aims to transform rural India by empowering rural women as Krishi Sakhi by imparting training and certification of Krishi Sakhi as Para-extension Workers.
- The KSCP is a key component of the broader 'Lakhpati Didi' program.
- This initiative aims to create three crore Lakhpati Didis by training and certifying women as Krishi Sakhis, thereby enhancing their agricultural skills and providing new employment opportunities.
- This initiative, supported by the Ministry of Agriculture and Farmers Welfare and the Ministry of Rural Development, aims to improve rural livelihoods and standards of living.
- Krishi Sakhi is envisaged to create awareness and capacity building in the community regarding agricultural activities and facilitate the aggregation and marketing of agricultural products.
- Krishi Sakhis are chosen as agriculture para-extension workers because they are trusted community resource persons and experienced farmers. Their deep roots in farming communities ensure they are welcomed and respected.
- **The kind of training provided**

- Agro Ecological Practices from land preparation to harvest
- Organising Farmer Field schools
- Seed banks establishment and management
- Soil health, soil and moisture conservation practices
- Integrated Farming Systems
- Basics of Livestock Management
- Preparation and use of Bio inputs and establishment of Bio inputs shops
- Basic communication skills

### **Global Economic Decoupling**

- The USA's recent tariffs on Chinese goods have revived concerns about a new era of economic decoupling between the US and China.
- Europe is also considering a 'united front' to counter China's pursuit of coercive economic practices.
- **USA's Approach**
- The US trade approach with China is increasingly driven by national security concerns, as it prioritises domestic politics and union interests over economic benefits.

- The recent tariff increase on Chinese electric vehicles aims to support American automakers and the United Auto Workers union, which also reflects the fears of China's growing dominance in the EV market.
- Tariffs on medical devices from China aim to reduce US dependence on Chinese manufacturing.

#### **Long-Term Effects of Protectionism**

- Tit-for-tat tariffs exacerbate protectionism, potentially prompting other countries to follow suit.
- Import restrictions on Chinese clean energy products could delay global green transition targets.
- China's slowing growth and rising household debts will impact Western multinationals and resource-rich countries like Australia and Brazil, reducing earnings and commodity prices.
- The EU's de-risking approach to critical raw minerals trade with China may lead Beijing to tighten supply chain control, potentially allowing a mineral-rich bloc to dictate green trade terms.
- Southeast Asia benefits from shifting production and investment but remains reliant on China for technology and investment. Stricter US rules of origin could hinder its prospects as a major supplier.
- India, with its growing consumer market, may benefit from decoupling, but gains and transition time are uncertain due to its manufacturing lag and economic ties with China.



- The escalation cycle endangers the liberal international order, worsened by deliberate distancing from the WTO and the paralysis of its adjudicatory process.
- According to the IMF, economic fragmentation could incur a long-term cost global GDP.

#### **Impact on Addressing Climate Change Problems**

- China accounts for 98% of the EU's supply of rare earth elements and 60% of global mined production.
- These elements are essential for technologies like electric vehicles, wind turbines, and solar panels that are critical for reducing carbon emissions and transitioning to renewable energy sources.
- Limiting access to Chinese solar panels could hamper the deployment of solar energy.
- A study by the University of California warns that a Western decoupling from cooperation with China on clean-energy technologies could have a global impact on efforts to mitigate climate change, with the "decoupling 'cure' likely to be worse than the integration 'disease'."
- The European Green Deal aims to slash car emissions and increase the share of renewable energy sources by 2030, highlighting the need for rare earth elements and s

### Viability Gap Funding Scheme for Offshore Wind Energy

The Union Cabinet has approved the **Viability Gap Funding (VGF)** scheme for **offshore wind energy projects** with a total outlay of Rs. 7453 crore.

It aims to implement the **National Offshore Wind Energy Policy, 2015**, with the goal of exploiting India's vast offshore wind energy potential within its **exclusive economic zone**.

- *The National Offshore Wind Energy Policy, 2015 aims to provide a **framework** for the development of offshore wind energy projects in India's exclusive economic zone (EEZ) and **territorial waters**.*
- **VGF for Offshore Wind Energy**
- Government VGF support will **reduce** the cost of power from offshore wind projects, making them more attractive for electricity **distribution companies (DISCOMs)** to purchase.
- **Private developers** will be chosen through a transparent bidding process to establish the projects.
- **Power Grid Corporation of India Ltd (PGCIL)** will be responsible for constructing the power evacuation infrastructure, including offshore substations.
- **Nodal Ministry: Ministry of New and Renewable Energy.**
- The construction and operation of offshore wind energy projects require **specific port infrastructure** to handle the storage and movement of heavy and large-dimension equipment. The **Ministry of Ports, Shipping, and Waterways** will support **two ports** to meet these requirements under the scheme.

- The scheme involves the installation and commissioning of **1 GW** of offshore wind energy projects (500 MW each off the coasts of **Gujarat** and **Tamil Nadu**).
- This scheme will initiate offshore wind energy development in India, creating an ecosystem to support **37 GW** of **offshore wind energy**, with an investment of ~Rs. 4,50,000 crore.
- *The government has permitted **Foreign Direct Investment (FDI)** up to **100 per cent** under the **automatic route** for renewable energy projects, including offshore wind energy projects.*

#### **Viability Gap Funding (VGF) Scheme**

- The Viability Gap Funding (VGF) Scheme aims to support infrastructure projects that are **economically justified** but slightly **lack financial viability**. This support is available only for projects where private sector sponsors are chosen through **competitive bidding**.
- The total VGF provided under the scheme is capped at **20%** of the total project cost, with the possibility of additional government grants up to another 20%.

#### **Offshore Wind Energy**

- Offshore wind energy (**renewable energy** source) refers to the generation of electricity from **wind turbines** installed in bodies of water, typically in the ocean or sea, **away from the shoreline**.

- The **electricity** generated by offshore wind turbines is transmitted to the shore through **submarine cables**, which are buried in the seafloor to protect them from anchors, trawling, and other potential hazards.
- **Advantages:** Higher adequacy and reliability, Lower storage requirement, Higher employment potential.
- Commissioning 1 GW of offshore wind projects will generate **3.72 billion units** of renewable electricity annually, **reducing CO2 emissions** by 2.98 million tons per year for 25 years.
- **Offshore Wind Energy in India**
- Presently, there is no offshore wind power capacity under commissioning in the country.
- The **National Institute of Wind Energy (NIWE)** in Chennai will be the nodal agency for resource assessment, surveys, and studies in the EEZ, demarcating blocks, and facilitating developers for wind farms.
- **Eight zones off Gujarat and Tamil Nadu coasts** were identified as high-potential regions for offshore wind energy through **LiDAR-based** wind resources and bathymetry assessment.

### Angel Tax

- Amid declining startup funding and job losses, Indian Inc. has urged the removal of the expanded **Angel Tax** from the **Finance Bill 2023**.
- Angel tax is an **income tax** (30.6%) levied on **unlisted companies** that issue shares to investors at a price exceeding the **fair market value**.
- The tax was introduced in 2012 to curb **money laundering** through inflated valuations of startup shares.

- The **Finance Act 2023** amended Section 56(2)(viib) of the **Income-tax Act**, extending the Angel Tax to **non-resident investors** from April 2024.
- **Concerns raised by the Industry**
- The industry argues that Angel Tax hinders startups' **growth** and **job creation**, as taxes levied on the difference between the issue price and FMV have **hurt funding** for startups.
- Investors often fund startups based on their **future potential**, not just current valuation, and Angel Tax penalises this practice. Recent data shows a **decline** in startup funding and job losses linked to Angel Tax.
- **CII** recommended eliminating Section 56(2)(viib) of the Income-tax Act to **boost capital formation**.

#### **Recent Developments**

- The government has **partially addressed** industry concerns by:
  - Exempting **DPIIT-recognised** startups from Angel Tax.
  - Excluding investors from **21 countries** (US, UK, etc.) from Angel Tax on non-resident investments.
- However, key investment source countries like Singapore, Netherlands, and Mauritius are still not exempt.

#### **Vadhavan Port**

- The Union Cabinet has approved the development of a Rs 76,200-crore all-weather **greenfield** deep draft major port at **Vadhavan** in **Maharashtra**.

- The project will be constructed by **Vadhavan Port Project Limited (VPPL)**, a Special Purpose Vehicle (SPV) formed by **Jawaharlal Nehru Port Authority (JNPA)** and **Maharashtra Maritime Board (MMB)**.
- The port, projected to be among the world's top 10, will create **1.2 million jobs**.
- It will feature nine 1,000-meter **container terminals**, four **multipurpose berths** (including a coastal berth), four **liquid cargo berths**, a **Ro-Ro berth**, and a Coast Guard berth.
- The port's capacities will aid **EXIM** trade flow through **IMEEC** (India Middle East Europe Economic Corridor) and **INSTC** (International North South Transportation Corridor).
- The Cabinet approved **road connectivity** between the port and national highways by the **Ministry of Road Transport & Highways** and **rail linkage** to the existing network and upcoming **Dedicated Rail Freight Corridor** by the **Ministry of Railways**.
- It is in alignment with the objectives of the **PM Gati Shakti program** to enhance economic activity and generate direct and indirect employment opportunities.
- **Global Competitiveness:** The port's world-class facilities will attract mainline mega vessels from international shipping lines.
  - Leveraging **Public-Private Partnerships (PPP)**, it will utilise modern technologies for efficient operations.

- **Trade Flow Enhancement:** Capacities created will facilitate EXIM trade flow through the IMEEEC and the International North South Transportation Corridor (INSTC).

### **Major Ports in India**

– These are under the **administrative control of the Ministry of Shipping** (while the non-major ports are under the jurisdiction of respective State Maritime Boards/ State Government).

### **West Coast Ports**

Kochi (Kerala); Kolkata (West Bengal); Kandla (Gujarat); Mormugao (Goa); New Mangalore (Karnataka); Mumbai or Bombay (Maharashtra); Jawaharlal Nehru Port or Nhava Sheva (Maharashtra); Vadhavan (Maharashtra)

### **East Coast Ports**

Chennai (Tamil Nadu); Ennore (Tamil Nadu); Paradip (Odisha); Visakhapatnam (Andhra Pradesh); V.O. Chidambaranar, formerly Tuticorin (Tamil Nadu); Port Blair (Andaman and Nicobar Islands)

### **Greenfield Project**

– It is a type of project that involves creating something **from scratch**. It is a term used to describe a project that has **no existing infrastructure, processes, or systems in place**.

### RBI Cancels License of the City Co-operative Bank

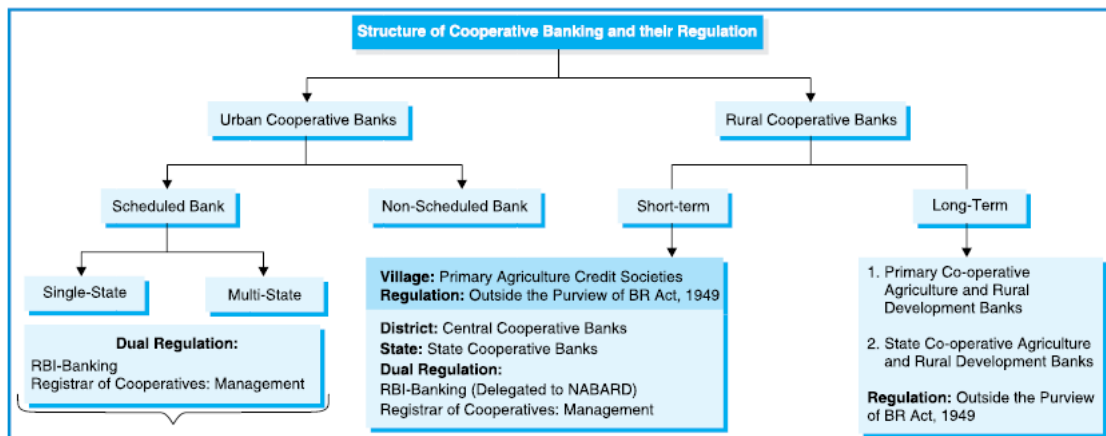
- The Reserve Bank of India canceled the license of the City Co-operative Bank, Maharashtra for lacking adequate capital and earning prospects.
- On liquidation, every depositor would be entitled to receive deposit insurance claim amount of his/her deposits up to a monetary ceiling of **Rs 5 lakh** only from Deposit Insurance and Credit Guarantee Corporation (DICGC) subject to the provisions of **DICGC Act, 1961**.
- **Cooperative Banks**
- Cooperative Banks refer to those financial institutions under the Banking System in India that operate on the **principles of cooperation and mutual benefit** for their members.
- They belong to their members who are both the owners and customers of the bank.
- They operate on the principle of **“one person, one vote”** in decision-making. Along with lending, these banks also accept deposits.
- **Regulation of Cooperative Banks in India**
- These banks in India, broadly, come under the dual control of:
  - **Reserve Bank of India:** Under the **Banking Regulation Act, 1949**, and the **Banking Laws (Application to Co-operative Societies) Act, 1965**, the RBI is responsible for regulating banking aspects of these banks, such as capital adequacy, risk control, and lending norms.
  - **Registrar of Co-operative Societies (RCS) of respective State or Central Government:** They are responsible for regulation of



management-related aspects of these banks, such as incorporation, registration, management, audit, supersession of board of directors, and liquidation.

### Structure of Cooperative Banks in India

- These banks, under the Banking System in India, are primarily categorized into – Rural Cooperative Banks (RCBS), and Urban Cooperative Banks (UCBS).
- They are further sub-categorised as shown below:



### Urban Cooperative Banks (UCBs)

- They operate in **urban and semi-urban areas** and mainly lend to small borrowers and businesses.
- Based on their regulation regime, they are categorized into two types – **Scheduled Banks and Non-Scheduled Banks.**

### Rural Cooperative Banks (RCBs)

- They focus on serving the financial needs of people in rural areas.

- Depending on the type of lending, they are divided into 2 sub-categories – Short-Term Structures, and Long-Term Structures.
  - **Short-Term Structures** are divided into State Cooperative Banks, District Cooperative Central Banks (DCCBs) and Primary Agricultural Credit Societies (PACS).
  - **Long-Term Structures** are divided into State Cooperative Agricultural and Rural Development Banks (SCARDBs) and Primary Cooperative Agricultural and Rural Development Banks (PCARDBs).

### **97th Constitutional Amendment Act 2011**

- It established the right to form cooperative societies as a fundamental right (**Article 19**).
- It included a new Directive Principle of State Policy on the Promotion of Cooperative Societies (**Article 43-B**).
- It added a new **Part IX-B** to the Constitution titled “**The Co-operative Societies**” (**Articles 243-ZH to 243-ZT**).
- It authorizes the Parliament to establish relevant laws in the case of **multi-state cooperative societies (MSCS)** and state legislatures in the case of other cooperative societies.

### **Revenue-Sharing Model**

- In an effort to bolster its revenue stream, national miner Coal India Ltd (CIL) has awarded its abandoned coal mines to private players on a **revenue-sharing model**.
  - Private sector coal miners bid to share a **minimum of 4 per cent revenue** with CIL for a **period of 25 years**.

- A revenue sharing model is a business model where two or more parties agree to share the revenue generated from a joint business activity.
- The Hydrocarbon Exploration and Licensing Policy (HELP) introduced in India includes a revenue sharing model where the government receives a share of the gross revenue from the sale of oil and gas, regardless of the costs incurred by the operator.

### **National Monetisation Pipeline**

- Recently, NITI Aayog informed that the **National Monetisation Pipeline** monetised Rs 3.85 Lakh Crore Assets In last 3 Years.

#### **Background**

– It was launched by the **Union Minister for Finance and Corporate Affairs** for Central Ministries and Public Sector Entities, and was **developed by NITI Aayog** in consultation with infrastructure line ministries, based on the mandate for **'Asset Monetisation' under Union Budget 2021-22**.

### **National Monetisation Pipeline**

- It is a strategic initiative aimed at **unlocking the value of brownfield public sector assets**.
- It lists **potential core assets of the Central Government** that can be monetized.'

- It estimates aggregate monetisation **potential of Rs 6.0 lakh crores** through core assets of the Central Government, over a four-year period, from **FY 2022 to FY 2025**.
- The estimated value corresponds to **about 14%** of the proposed outlay for Centre under **National Infrastructure Pipeline (NIP) i.e. Rs 43 lakh crore**.
- The **top 5 sectors** (by estimated value) **capture about 83% of the aggregate pipeline value**.
  - These include: Roads (27%) followed by Railways (25%), Power (15%), Oil & Gas Pipelines (8%) and Telecom (6%).
- It aligns with the philosophy of '**Creation through Monetisation**', tapping private sector investment for new infrastructure development.
- **Vision and Purpose**
- NMP aims to provide universal access to high-quality and affordable infrastructure for all citizens.
- It encourages private sector participation in infrastructure creation, fostering economic growth and welfare.
- **Asset Monetization Approach**
- It focuses on **structured contractual partnerships**, rather than outright privatisation.
- Institutional and long-term patient capital can be leveraged for further public investments.
- **Infrastructure Sectors Covered**

- The pipeline includes sectors such as roads, railways, power, telecommunications, shipping ports, and more.
- These assets will be monetised over the specified four-year period.
- **Ministries Performance (2023-24)**
- The Ministries of **Road Transport and Highways** (Rs 40,314 crore) and Ministry of **Coal** (Rs 56,794 crore) were the **top two achievers** with a total achievement of Rs. 97,000 crore.
- The Ministry of **Power** (Rs 14,690 crore), **Mines** (Rs 4,090 crore), **Petroleum and Natural Gas** (Rs 9,587 crore), **Urban** (Rs 6,480 crore), and **Shipping** (Rs 7,627 crore) have **achieved more than 70% of the target** set for them.

### Container Port Performance Index

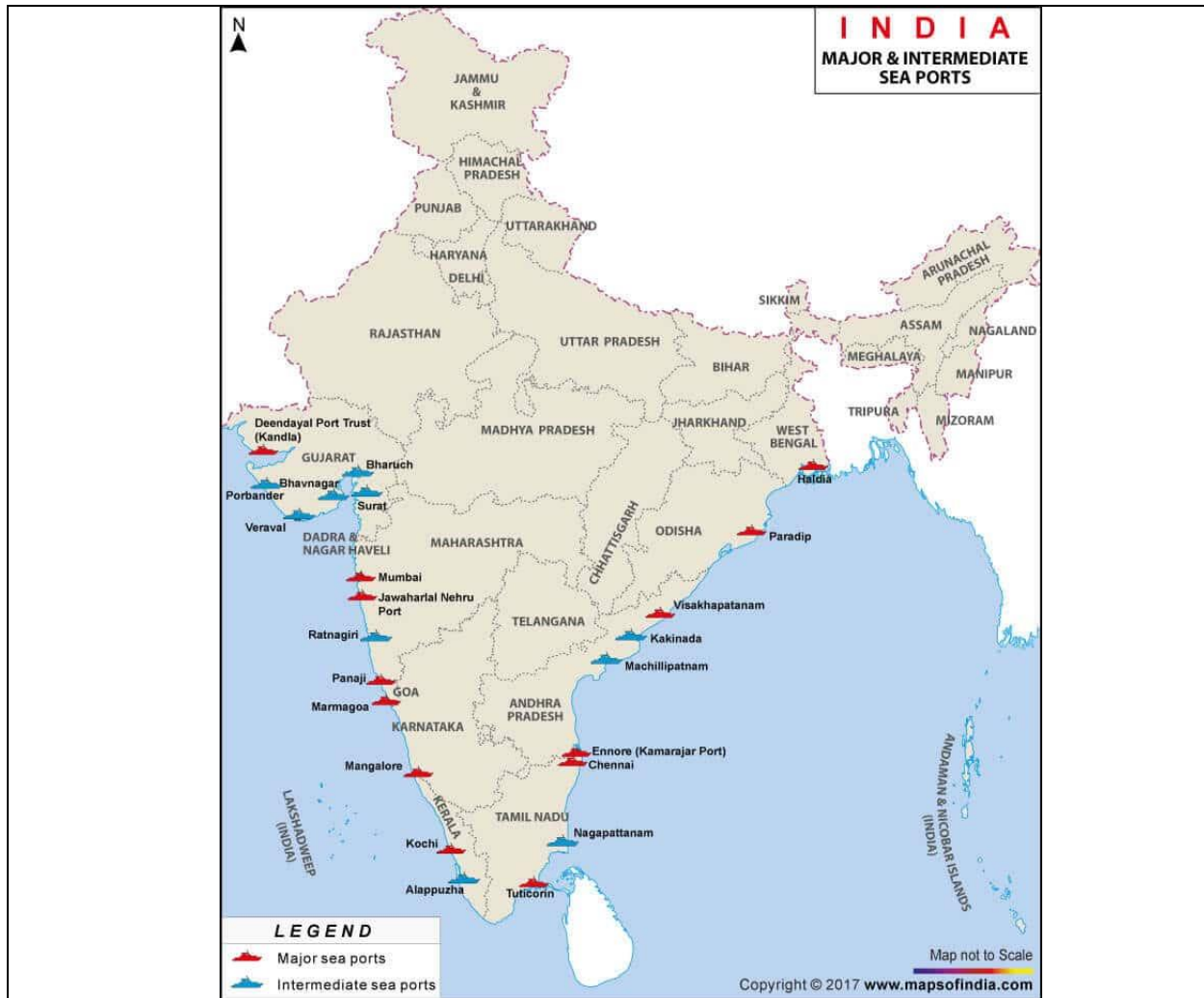
As many as nine ports of India have made it to the global top 100 rankings in the latest edition of Container Port Performance Index.

#### Container Port Performance Index:

- It is a highly regarded benchmark that assesses the performance of ports on parameters such as productivity, efficiency, and reliability.
- It is released by the **World Bank** and **S&P Global Market Intelligence**.
- It serves as a reference point for key stakeholders, including national governments, port authorities, development agencies, supra-national

organisations, and private operators, in trade, logistics and supply chain services.

- Highlights of CPPI 2023:
- **Yangshan port** in China and **Salalah port** in Oman emerged as the top two ports in the rankings.
- Nine Indian ports have secured places among the top 100 global ports.
- While **Visakhapatnam Port** made it to the top 20 ports of the world at 19 in 2023, **Mundra Port** also climbed up the index at 27 in the current ranking.
- This also marks an advancement from Visakhapatnam's 115th rank and Mundra's 48th position in the 2022 rankings.
- Vishakhapatnam Port has demonstrated impressive performance with **a turnaround time (TRT) of 21.4 hours**, achieving 27.5 moves per crane hour, and minimising **berth idle time**.
- Additionally, seven more Indian ports, secured ranks in the top 100: Pipavav (ranked 41), Kamarajar (47), Cochin (63), Hazira (68), Krishnapatnam (71), Chennai (80), and Jawaharlal Nehru JNPA (96).



### Major ports in India

- Chennai Port, Kolkata Port, Haldia Port (West Bengal), Jawaharlal Nehru Port (Maharashtra), Kamarajar Port or Ennore Port (Chennai), Kandla Port (Gujarat), Kochin Port (Kerala), New Mangalore Port (Karnataka), Mormugao Port (Goa), Mumbai Port, Paradip Port (Odisha), Tuticorin Port (Tamil Nadu), Visakhapatnam Port (Andhra Pradesh).

**Government imposes stock limits on tur, chana dal to curb hoardings.**

Recently, the government imposed stock limits on tur (pigeon pea) and chana (chickpea) dal for all states and union territories until September this year.

- **Stock-holding limit:** A regulatory measure that imposes caps on the quantities of specific commodities, such as pulses, that retail shops and traders can store.
- **Applicability:** The Centre passed the **Removal of Licensing Requirements, Stock Limits and Movement Restrictions on Specified Foodstuffs (Amendment) Order, 2024**, specifying stock limits for wholesalers, retailers, supermarkets, millers and importers for the two commodities

Reason: The move is aimed to:

1. Prevent hoarding.
  2. Curb unscrupulous speculation.
  3. Improve affordability of tur and chana for consumers.
  4. Curb Price Inflation.
- **Monitored by:** The **Department of Consumer Affairs** has been closely monitoring Pulses stock position through the stock disclosure portal.

Government Initiatives to Stabilise Pulses Market and Ensure Affordability

- **Enforcement of Mandatory Stock Disclosure:** The department communicated with state governments to enforce mandatory stock disclosure by all stockholding entities.



- Follow-up visits to major pulses-producing states and trading hubs were conducted across the country.
- **Stakeholder Meetings:** Separate meetings were held with traders, stockists, dealers, importers, millers, and big-chain retailers to encourage truthful stock disclosure and maintain the affordability of pulses for consumers.
- **Import Duty Reduction:** To boost domestic production, the government reduced the import duty on desi chana by 66 per cent.
- The duty reduction has facilitated imports and prompted higher sowing of chana in major producing countries.
- **Expected Increase in Kharif Pulses Sowing:** The sowing of Kharif pulses like tur and urad is expected to rise significantly this season due to farmers' high price realisation and the India Meteorological Department (IMD) prediction of **above-normal monsoon rains**.
- **Imports of Tur from East Africa and Chana from Australia:** Imports of the current year's crop of tur from East African countries and Chana from Australia will help maintain the affordable availability of Chana to consumers.

**RBI has recently revised its incentive framework to push banks to increase the flow of priority sector credit to districts with lower credit flow.**

#### **New Guidelines of Priority Sector Lending**

- *Objective:* To address the regional disparities at the district level, the new measure will encourage banks to provide small loans in economically disadvantaged districts with low average loan sizes.

- The new norms discourage lending in districts with high average loan sizes.
- RBI maintains a district wise ranking in terms of per capita credit flow and circulates this with banks so that the lenders raise their efforts as per need to address the gap.
- These lists will remain valid until FY 2026-2027, after which it will be reviewed.
- **The RBI Revised Guidelines**
- The RBI has with effect from FY25, assigned a higher **weight of 125% to the incremental priority sector credit** in the districts with per capita priority sector credit less than Rs 9000
- This effectively means that if a bank gives Rs 100 loan in low credit flow district, it will be considered as Rs 125 priority sector loan.
- Dis-incentive Framework: RBI also follows a disincentive framework for districts with comparatively higher flow of priority sector credit in which a lower 90% weight is assigned for districts where the per capita priority sector credit flow is greater than Rs 42,000.
- The weight is maintained at 100% for all other districts not mentioned by the central bank.
- Previous Provision: RBI until now followed a rule of higher weight of 125% in districts where per capita priority sector credit flow was Rs 6000 and the disincentive framework threshold was Rs 25000 earlier.

### **Priority Sector Lending**

- Priority Sector means those sectors which the Government of India and Reserve Bank of India **consider as important** for the development of the basic needs of the country and are to be given priority over other sectors.
- The banks are mandated to encourage the growth of such sectors with adequate and timely credit.
- Provision: In exercise of the powers conferred by **Sections 21 and 35A read with Section 56 of the Banking Regulation Act, 1949.**
- Applicability: The Priority Sector Lending provisions apply **to every domestic and foreign Commercial Bank [including Regional Rural Bank (RRB), Small Finance Bank (SFB), Local Area Bank] and Primary (Urban) Co-operative Bank (UCB)** other than Salary Earners' Bank.
- Categories: There are 9 sectors under which the priority sector norms apply:
  - Agriculture; Micro, Small and Medium Enterprises; Export Credit; Education; Housing; Social Infrastructure; Renewable Energy; Others; weaker Section.

### International Sugar Organisation

India is hosting a global event in the sugar sector '**International Sugar Organisation (ISO) Council Meeting**' in New Delhi from 25th till 27th June, 2024.

#### **International Sugar Organisation:**

- It is an inter-governmental body completely devoted to improving conditions in the world sugar market.

- It was established in **1968** and it is also a **UN affiliated body**.
- It has about 85 countries as members covering almost 90% of sugar production in the World.
- Mandate: It is mandated to bring major sugar producing, consuming and trading nations together to bring mutual understanding and progressive approach in dealing with issues pertaining to the sugar sector.
- It has also been working on **biofuels**, especially ethanol as *sugarcane is the second major feedstock for ethanol production in the world*.
- The ISO exists to administer the internationally negotiated **1992 International Sugar Agreement (ISA)**, the objectives of which are:
  - To ensure enhanced international cooperation in connection with world sugar matters and related issues.
  - To provide a forum for intergovernmental consultations on sugar and on ways to improve the world sugar economy.
  - To facilitate trade by collecting and providing information on the world sugar market and other sweeteners.
  - To encourage increased demand for sugar, particularly for non-traditional uses.
- **Headquarters: London**
- **Sugar industry in India**
- Sugar industry is an important agro-based industry that impacts rural livelihood of about **50 million sugarcane farmers** and around 5 lakh workers directly employed in sugar mills.

- India is the largest consumer and second largest producer of sugar in the world with about **15 per cent** share in global sugar consumption and about **20 per cent in production**.
- **Brazil** is the top sugar producer in the **world**.

**Central Electronics Limited (CEL) has recently been awarded “Mini RATNA” status (Category-1).**

*Mini Ratna (category 1):*

- **Eligibility:** To be eligible for Mini Ratna (Category-1) status, a company must have made a profit for the last three consecutive years, achieved a **pre-tax profit of Rs. 30 crores or more** in at least one of those three years, and have a positive net worth.

*Category-I, Central Public Sector Enterprises (CPSE):*

1. Airports Authority of India (AAI)
2. Antrix Corporation
3. Bharat Dynamics Limited (BDL)
4. Bharat Earth Movers Limited (BEML)
5. Bharat Sanchar Nigam Limited (BSNL)
6. Central Warehousing Corporation
7. Cochin Shipyard (CSL)
8. Dredging Corporation of India (DCI)
9. Garden Reach Shipbuilders & Engineers (GRSE)
10. Goa Shipyard (GSL)
11. India Tourism Development Corporation (ITDC)
12. Indian Railway Catering and Tourism Corporation (IRCTC)
13. IRCON International

14. Mazagaon Dock Shipbuilders Limited

15. Grid Controller of India Limited (GRID-INDIA)

	<b>Miniratna Category-I</b>	<b>Miniratna Category-II</b>
Eligibility Criteria	Have made profits continuously for three years or Earned a net profit of Rs. 30 crores or more in one of the three years	Have made profits continuously for the last three years and should have a positive net worth.
Benefits for Investment	Financial Autonomy up to Rs. 500 crore or equal to their net worth, whichever is lower.	Financial Autonomy of up to Rs. 300 crore or up to 50% of their net worth, whichever is lower.

Central Electronics Limited (CEL):

- It operates under the **Department of Scientific and Industrial Research** (DSIR) of the Ministry of Science & Technology.

- **Objective:** Established in **1974**, its objective is to exploit indigenous technologies commercially.
- It is a pioneer in the country's **solar photovoltaic (SPV) field**.

### **RBI unveils revised Currency Swap Arrangement for SAARC countries.**

Recently, the Reserve Bank of India (RBI) with the concurrence of the Government of India has decided to put in place a revised **Framework on Currency Swap Arrangement** for SAARC countries for the period 2024 to 2027.

- The Currency Swap Facility will be available to **all SAARC member countries**, subject to their signing the bilateral swap agreements.

#### Currency Swap Arrangement for SAARC Countries:

- A currency swap between two countries is an agreement or contract to exchange currencies with pre-determined terms and conditions.
- **Launched: In November 2012**

- **How Currency Swap Arrangement works in SAARC Countries?**

- Suppose India signs a currency swap agreement worth \$5 million with say, Nepal. India will then provide a loan to Nepal in a foreign currency which may be US Dollar.
- In return, Nepal will have to return the money in **Indian Rupees at a fixed interest rate**.

- **Objective:** To provide a backstop line of funding for short-term foreign exchange liquidity requirements or balance of payment crises of member countries.
- **Availability:** The currency swap window will be available to all SAARC member countries, provided they sign bilateral agreements.
- **Multiple Windows:** Under the Framework for 2024-27, a separate INR Swap Window has been introduced with various concessions for swap support in Indian Rupee.
- The RBI will continue to offer swap arrangements in US dollar and euro under a separate window with an overall corpus of \$2 billion.

Currency Swap Arrangement

- **Refers:** Two parties exchange equivalent amounts of two different currencies and trade back at a later specified date.
- Currency swaps are often **offsetting loans**, and the two sides often pay each other interest on amounts exchanged.
- Currency swaps are **over-the-counter (OTC)** financial instruments. This means they are **not traded on a centralized exchange**.
- So far, the Commerce Ministry, Government of India, has finalized arrangements with **some 23 countries** with whom Indians can trade in local currencies such as **Angola, Algeria, Nigeria, Iran, Iraq, Oman, Saudi Arabia, Yemen, Japan, Russia, etc.**
- **Conducted by:** Financial institutions conduct most of the Foreign Currency (FX) Swap, often on behalf of a nonfinancial corporation.



- **Significance:** Swaps can be used to hedge against exchange rate risk, speculate on currency moves, and borrow foreign exchange at lower interest rates.

Uses of Currency Swaps

- Allow companies to hedge their foreign exchange exposures.
- Help to lower financing costs, as it may be cheaper to borrow in a foreign currency.
- To gain access to a foreign currency.
- To take advantage of interest rate differentials between two countries.

Limitations of Currency Swaps

- Like any financial instrument, currency swaps possess several limitations and risks.
- **Counterparty Risk:** It means there is a risk that one of the parties may default on their obligations.
- **Complexity:** Some financial institutions may find it difficult to use them effectively.
- **Significant Associated Costs:** There may be significant costs associated with entering and managing the swap agreement, depending on the structure. These costs may be attributed to swap fees and hedging costs.
- **Limited Liquidity:** It makes it difficult to enter or exit a swap agreement at a favorable rate.

***South Asian Association for Regional Cooperation (SAARC)***

- SAARC is a **regional intergovernmental** organization of South Asian countries.
  - Establishment: **In December 1985**
- **Member Countries:** Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and Afghanistan
- **Nine Observer States:** China, the US, Myanmar, Iran, Japan, South Korea, Australia, Mauritius and the European Union.
  - **Headquarters and Secretariat: Kathmandu, Nepal**

**Recently, Capital markets regulator Sebi approved norms to regulate unregistered financial influencers, also referred as finfluencers.**

These influencers often operate on a **commission-based model**.

Finfluencers:

- Finfluencers are people with **public social media platforms** offering advice and *sharing personal experiences about **money and investment in stocks***.
- Their videos cover budgeting, investing, property buying, cryptocurrency advice and financial trend tracking.
- Reason for Rise in Numbers:
- The rise of finfluencers can be attributed to
- India's **low financial literacy** rate of 27%
- **Influx of new investors** during the Covid-19 pandemic.
- Many first-time investors turned to finfluencers for guidance: Due to **Democratization of trading** through new-age broking apps and Affordable smartphones.

- Filling the Vacuum: **Lack of financial education** and the focus on market updates by business news channels created a vacuum that influencers have been filling.  
*What's the Issue?*
- **Indian stock market is booming:** A surge in retail investors' participation in equity markets during the pandemic has led to a rise in so-called influencers pushing financial advice via social media platforms.
- According to SEBI data, India had **154 million trading accounts** as of April 2024
- This is a more than four times jump from the 36 million trading accounts in April 2019.
- **Potential to influence a large number of people:** This is increasing the popularity of so-called financial influencers who advise on stocks and other related investments through their channels on YouTube and Instagram.
- Some of these influencers have lakhs of followers with their investment advice being closely followed by millions of people across the country.

The Guidelines for Financial Influencers:

**Norms on Financial Influencers**

- It will be the responsibility of the regulated entity to ensure individuals with whom it is associated do not breach the rules of conduct set by SEBI.
- These guidelines stipulate avoiding the promise of assured returns.

- Under the new rules, brokers and mutual funds are prohibited from using the services of unregulated financial influencers for marketing and advertising campaigns.
- *Exemption:* Financial influencers engaged in investor education will be exempted from the new restrictions.

#### **Eased Delisting Rules**

- Changes to delisting rules: This would make it easier for companies to exit from stock exchanges.
- Currently, delisting is carried out via reverse book-building.
- Companies can now offer shareholders fixed prices for shares as an alternative mechanism to delist from stock exchanges.

#### **Derivative Trading Regulations**

- New criteria introduced: To decide on stocks that can be linked to derivative products, such as futures and options.
- With the adoption of these guidelines, the total number of stocks eligible for derivative trading will rise marginally.

#### Risk Associated With Finfluencers

- The practices associated with finfluencers poses various impacts, few are mentioned below:
- **Unregistered And Unauthorised:** SEBI notes that while some of them may be genuine educators, “many of them are effectively unregistered and unauthorised Investment Advisers (IAs) or Research Analysts (RAs).”

- The number of 'unregistered' investment advisors giving **unsolicited 'stock' tips** on social media platforms has increased dramatically.
- **Unethical Practices:** If there is any kind of monetary transaction that happens between them and the entity they are promoting.
- **Lack Knowledge or Expertise:** Finfluencers not registered with relevant financial sector regulators may not possess the requisite qualifications or expertise on the subject.
- **Definitions Clarity:** Definition of Finfluencers should be clear, stand test of judicial – regulatory scrutiny.
- **Price Manipulation:** In addition, certain companies used social media platforms to boost their share prices through influencers.
- **ASCI's Guidelines violated:** The **Advertising Standards Council of India (ASCI)** has issued guidelines for social media influencers and advertisers regarding **virtual digital assets (VDAs)**, including cryptocurrencies and non-fungible tokens (NFTs).
- **Non-Compliance:** ASCI's recent half-yearly report highlighted cases of *non-compliance by social media influencers* with advertising guidelines.
- **Celebrity endorsements:** A prominent Bollywood actor violated ASCI's Guidelines guidelines who posted an ad about **'Beyond Life NFT'**.

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

**1.PRAVAAH Portal (Platform for Regulatory Application, Validation and AuthHorisation):**

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

*Need of PRAVAAH Portal:*

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

## 2. Retail Direct mobile app:

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

### Benefits of Retail Direct Scheme:

- **Direct Access:** Within the scheme, small investors have the opportunity to directly purchase or sell government securities (G-Secs), or bonds, without the need for an intermediary such as a mutual fund.

- **Zero Default Risk:** With the government as the borrower, there's a sovereign guarantee for the funds, ensuring zero risk of default.
- **Interest Rate Advantage:** Additionally, government securities may provide more attractive interest rates compared to bank fixed deposits, contingent upon prevailing interest rate trends.

### 3. FinTech Repository

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



- **Ownership:** EmTech Repositories are secure web-based applications and are managed by the Reserve Bank Innovation Hub (RBIH), a wholly owned subsidiary of RBI.

### ENVIRONMENT

#### 60th meeting of the Subsidiary Bodies (SB60)

As the world gears up for the **29th Conference of Parties (COP)** to UNFCCC later this year, Delhi-based think tank **Centre for Science and Environment (CSE)** has called on developed countries to fulfill their financial obligations in the fight against climate change.

#### SB60:

- The 60th Sessions of **United Nations Framework Convention on Climate Change (UNFCCC) Subsidiary Bodies** (also called the **2024 Bonn Climate Change Conference**) will build on the many mandates that emerged at COP28 in Dubai, and aim to drive forward progress on key issues and prepare decisions for adoption at the COP29 UN Climate Change Conference in **Baku, Azerbaijan**, in November of 2024.
- The mid-year climate conference, also known as the 60th meeting of the Subsidiary Bodies (SB60) will bring together countries that are signatories to the United Nations Framework Convention on Climate Change (UNFCCC).

It will focus on critical issues such as-

1. Climate finance

2. Advancing progress on the next round of national climate action
  3. plans (Nationally Determined Contributions- NDCs)
  4. Timely submission of countries'
  5. First Biennial Transparency Reports
  6. Work on National Adaptation Plans
  7. Accelerating climate action through a just transition
- It will feature the inaugural **Annual Global Stock take (GST) Dialogue**, which aims to foster a sharing of effective strategies and lessons learned on how countries are incorporating the GST outcomes into their **Nationally Determined Contributions (NDCs)**, promoting collaborative learning and progress towards achieving the Paris Agreement's goals.

Centre for Science and Environment (CSE):

- Centre for Science and Environment (CSE) is a public interest research organisation based in New Delhi.
- It researches and communicates the urgency of development that is sustainable and equitable.
- It works as a think tank on environment-development issues in India, poor planning, climate shifts devastating India's Sundarbans and advocates for policy changes and better implementation of the already existing policies.
- The **Ministry of Urban Development (MoUD)** has designated Centre for Science and Environment (CSE) as a **"Centre of Excellence" (CoE) for sustainable water management.**

**A distinctive plant named *Thismia malayana*, which steals nutrients from underground fungi, has been published as a new species.**

*Thismia malayana*:

- It is a new species of plant discovered in the tropical rainforests of **Peninsular Malaysia**.
- It belongs to a group of plants known as **mycoheterotrophs**.
- Unlike most plants, mycoheterotrophs do not perform photosynthesis.
- Instead, they act as **parasites**, stealing carbon resources from the fungi on their roots.
- This adaptation takes advantage of the **mycorrhizal symbiosis**, which is usually a mutually beneficial relationship between **colonizing fungi and a plant's root system**.



*What happens in mycorrhizal symbiosis?*

- The **fungi help the tree absorb water and nutrients from the soil, while the tree provides the fungi with sugars produced through photosynthesis.**
- This symbiotic partnership is vital for the health and growth of both organisms.
- But *Thismia malayana*, instead of contributing to the exchange, acts as a parasite, siphoning off carbon resources from the fungi without offering anything in return.
- By stealing nutrients from fungi, this newly discovered species thrives in the low-light conditions of dense forest understories, where its highly specialised flowers are pollinated by **fungus gnats** and other small insects.
- The unusual plant is around 2 cm long and is typically found hidden in leaf litter and growing near tree roots or old rotten logs.
- Despite its small size, *Thismia malayana* is very sensitive to environmental changes and has been classified as **Vulnerable** according to the IUCN Red List.

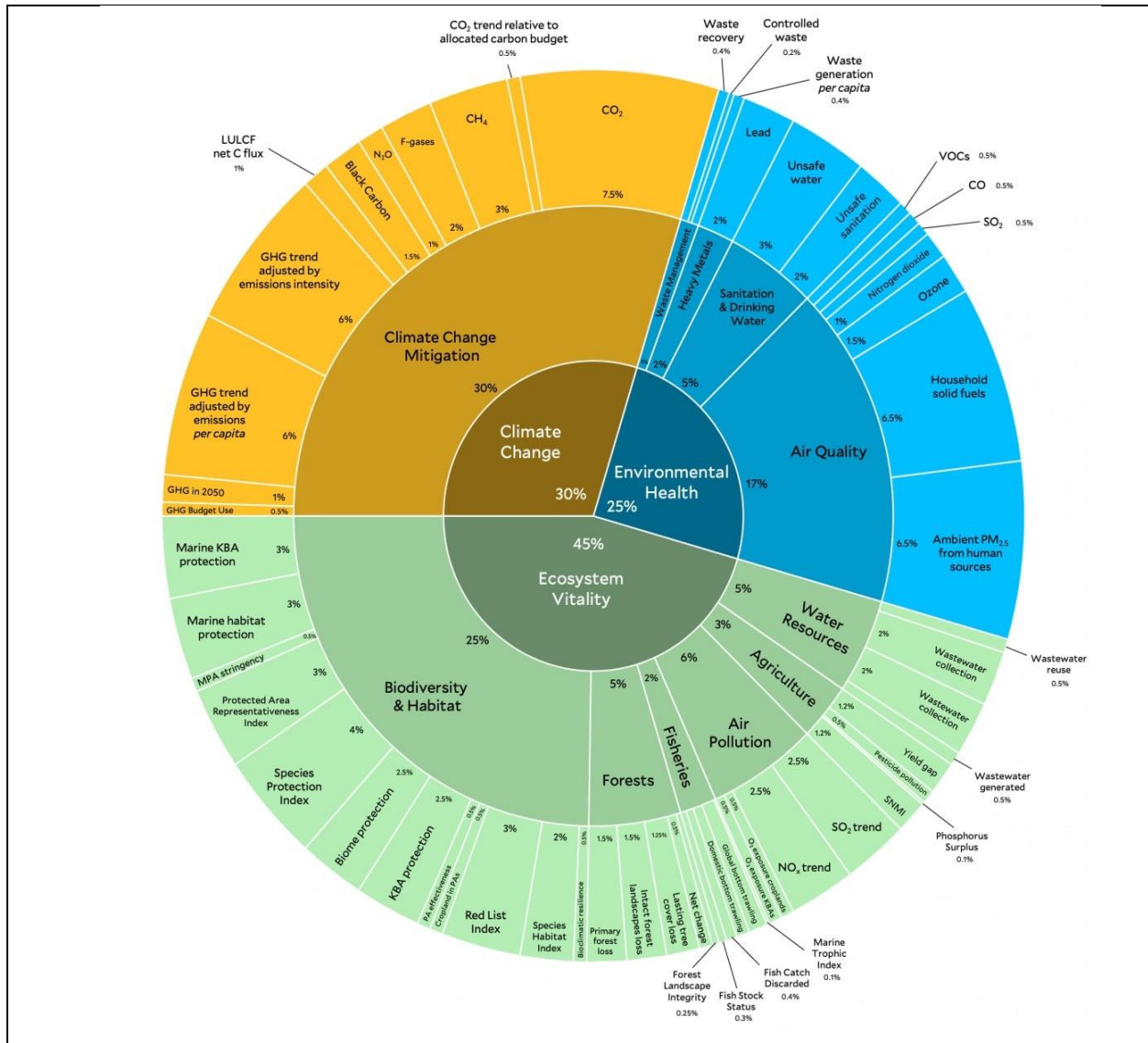
**The 2024 Environmental Performance Index (EPI) was released by the Yale Center for Environmental Law & Policy and the Center for International Earth Science Information Network (CIESIN).**

Key Highlights On Environmental Performance Index 2024:

- With a commendable score of 51.9 out of 100, **Oman** now occupies the **50th position** globally, significantly improving from its **149th rank in 2022 among 180 countries**.
- **Increasing Biodiversity sites:** The establishment of new natural reserves through Royal decrees has significantly bolstered Oman's environmental rating, increasing the number of reserves to about 30 and biodiversity-focused sites to over 25.

Environmental Performance Index (EPI):

- The Environmental Performance Index (EPI) is a global ranking system that assesses countries' environmental health.
- The **World Economic Forum** introduced the **Environment Sustainability Index** in 2002, and it is updated every two years.
- **Published by:** The **Yale Center for Environmental Law and Policy**, in collaboration with the Columbia University Center for International Earth Science Information Network, prepares the EPI.



Significance of Environmental Performance Index (EPI):

- Identifying Top Performance Drivers: The EPI helps decision-makers identify the factors behind high environmental performance.

- Key Factors for Sustainability: Analysing EPI data shows that financial resources, good governance, human development, and regulatory quality are crucial for enhancing a country's sustainability.
- **Promoting Sustainable Development:** By highlighting these connections, the EPI promotes sustainable development for a more secure and equitable environmental future.  
*Framework:*
- The framework organizes 58 indicators into 11 issue categories and three policy objectives, with weights shown at each level as a percentage of the total score.
- **New Metrics:** The EPI 2024 introduces new metrics in response to emerging goals and recent environmental reports.
- **Emissions Assessment:** One notable addition is assessing individual countries' progress in reducing their greenhouse gas (GHG) emissions.
- **Increased Emission Reductions:** The report reveals that more countries are reducing their emissions than previously thought.
- However, only five nations – **Estonia, Finland, Greece, Timor-Leste, and the UK** – have reduced their emissions enough to reach net zero or be on track to do so by 2050 if they continue at their current rate.
- **Metrics for Habitat Protection:** The 2024 EPI has introduced new metrics to measure how well countries protect essential habitats and regulate protected areas. This is in response to the **Kunming-Montreal Global Biodiversity Framework's** goal of protecting **30% of land and sea by 2030**.

- The report shows that many countries have met conservation goals, but the loss of natural ecosystems remains a major challenge. In 23 countries, over 10% of protected lands are occupied by buildings and agriculture.

India's Performance:

- **Rank of India:** The 2024 Environmental Performance Index ranks India **176th** out of 180 countries, highlighting serious environmental challenges.
- Despite slight progress in climate change mitigation, India scores poorly in air quality and sanitation.
- India's overall ranking is grim but fares slightly better in the **Climate Change Index**, ranking 133rd with 35 points.
- Key issues highlighted for India include poor air quality, with a specific mention of **high PM2.5 exposure** and significant challenges in managing solid waste and sanitation.
- Despite these challenges, there are positive indicators such as a relatively high rank in the **Species Habitat Index**.
- However, India ranks fifth in air quality in South Asia with 6.8 points.

**A rare four-horned antelope has been sighted for the first time in Veerangana Durgavati Tiger Reserve (Sagar district), which was earlier known as Nauradehi Sanctuary.**

Four-Horned Antelope:

- The four-horned antelope, also called **Chousingha**, is a small bovid antelope.



- They are the smallest antelopes found in Asia.

**OUR FM 3 TEST 23. QN. NO .24**

1. It is a "drop-in" fuel. 2. Its .... conventional jet fuel.  
3. It ... without modifications. Which of the above is/are true  
w.r.t. **Sustainable Aviation Fuel?** (a) .. (b) .. (c) .. (d) .. Unlike traditional fuels, it is produced  
from renewable sources such as **agricultural waste, municipal solid waste, and agroforestry  
residues.**

**UPSC PRELIMS 2024**

.Consider the following materials:

1. Agricultural residues 2. Corn grain 3. Wastewater treatment sludge 4. Wood mill waste  
Which of the above can be used as feedstock for producing **Sustainable Aviation Fuel?**  
(a) .. (b) .. (c) .. (d) ..

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THE RIGHT WAY.**



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**PRELIMS 2025  
TEST BATCH  
FROM JULY 14.**

**ONLINE (ALL INDIA) /  
OFFLINE (CLASSROOM)**

**TOTAL - 30 TESTS**

**(25 SECTION WISE + 05 FULL LENGTH)**

**CLEAR PRELIMS 2025! THAT'S IT.**

 **9884 554 654**

**19** YEARS  
OF ETHICAL  
IAS COACHING



Door No: 1124, 1st street,  
G-Block 11th Main Road, Anna Nagar,  
Landmark: Tik Tak Cafe,  
**CHENNAI - 600040.**

- **Scientific Name:** *Tetracerus quadricornis*

**Distribution:**

- It is endemic to India and Nepal.

- In India, they range from the foothills of the Himalayas in the north to the Deccan Plateau in the south.

**Habitat:**

- They mostly occur in open, dry, deciduous forests in hilly terrain.
- They inhabit areas with significant cover from grasses or heavy undergrowth, and close to water bodies.

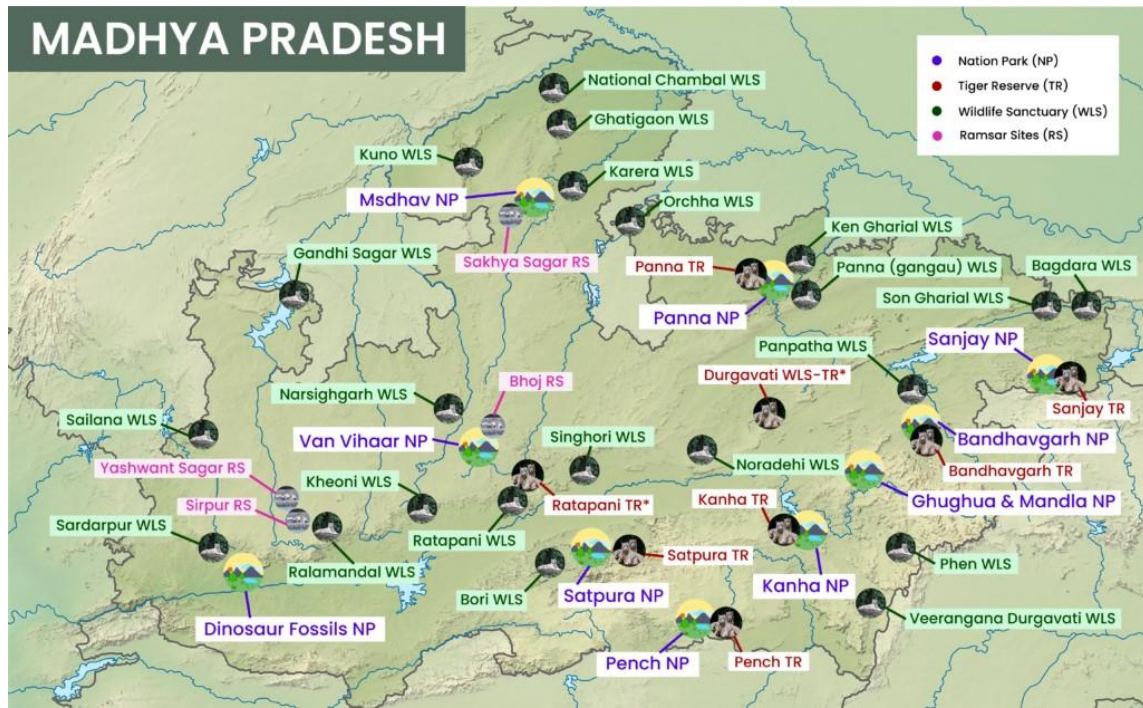
**Features:**

- They have a yellowish-brown to reddish coat and are slender, with small legs and a short tail.
- These antelopes have four horns, which distinguish them from most other bovids, which have two horns.
- Only males in this species grow horns. One pair of horns is **located between the ears**, and the other on the forehead.
- They are usually **diurnal** and solitary by nature; however, can be spotted in loose groups of three to four.

**Conservation Status:**

- **IUCN Red List: Vulnerable**
- Veerangana Durgavati Tiger Reserve:
- Location: It is spread across Sagar, Damoh, and Narsinghpur, districts of Madhya Pradesh.
- It is spread over an area of 2,339 square kilometres.
- It is the seventh tiger reserve in Madhya Pradesh.

- It will encompass areas within the **Nauradehi Wildlife Sanctuary** and **Durgavati Wildlife Sanctuary**.
- A green corridor linking **Panna Tiger Reserve (PTR)** with **Durgavati** will be developed for the natural movement of the tiger to the new reserve.
- **Rivers:** Parts of the reserve fall under the Narmada and Yamuna River basins.
- The **Singorgarh Fort** is located within the reserve.
- **Vegetation:** Dry deciduous type
- **Flora:** The chief floral elements include Teak, Saja, Dhaora, Ber, Amla etc.
- **Fauna:** Tiger, leopard, wolf, jackal, Indian fox, striped hyena, Nilgai, Chinkara, Chital, Sambhar, Black Buck, Barking deer, Common Langur, Rhesus Macaque, etc.



Recently, three out of the six states where the Centre has proposed 'Eco-sensitive areas (ESA)' to safeguard the Western Ghats have requested a reduction in the size of these ESAs.

Eco-Sensitive Areas (ESA):

- The **National Environment Policy (2006)** defined **Eco-Sensitive Zones** "as areas/zones with identified environmental resources having incomparable values which require special attention for their conservation" because of their landscape, wildlife, biodiversity, historical, and natural values.
- **Designation:** Eco-Sensitive Areas (ESAs) are designated within a **10-kilometer radius around Protected Areas, National Parks, and Wildlife Sanctuaries.**
- **Notified by:** The Ministry of Environment, Forest, and Climate Change (**MoEFCC**) notifies them under the **Environment Protection Act of 1986.**
- **Objective:** The primary objective is to regulate specific activities near these areas to mitigate their adverse effects on the delicate ecosystem surrounding the protected zones.

Western Ghats:

- The Western Ghats are a mountain range that runs almost parallel to India's western coast. They span 1,600 kilometres from the mouth of the **Tapti River near the Gujarat-Maharashtra border to Kanyakumari in Tamil Nadu.**

- It covers six states: Tamil Nadu, Karnataka, Kerala, Goa, Maharashtra, and Gujarat.
- **Biodiversity:** The Western Ghats harbor over 30% of India's plant, fish, herpetofauna, bird, and mammal species.
- Additionally, it boasts the unique shola ecosystem, characterised by montane grasslands interspersed with patches of evergreen forest.
- **Resources:** The Western Ghats are abundant in certain areas of iron, manganese, and **bauxite ores**.
- **Plantations:** This region supports numerous plantation crops and is a significant source of timber.
- It also contains many wild relatives of cultivated plants, such as pepper, cardamom, mango, jackfruit, and plantain.

**A new study published in the journal Nature Climate Change reported a significant decrease in atmospheric hydrochlorofluorocarbons (HCFCs) five years before the target year.**

Key Findings On Ozone-depleting HCFCs

- The study is titled as **“A decrease in radiative forcing and equivalent effective chlorine from hydrochlorofluorocarbons”**
- **Peaking of Emissions:** HCFC emissions peaked in 2021, five years earlier than anticipated in 2026.
- Ozone-depleting HCFCs-

- **Impact of HCFCs:** Their impact on the Earth's energy balance (known as **radiative forcing**) and the amount of chlorine in the atmosphere (called equivalent effective chlorine) have decreased since 2021, five years earlier than expected.
  - The global direct radiative forcing from HCFCs: It decreased to 61.28 milliWatt per square metre ( $\text{mW m}^{-2}$ ) in 2023 down from 61.67  $\text{mW m}^{-2}$  in 2022.
  - The **equivalent effective chlorine (EECI) of HCFCs** decreased to 319.33 one part per trillion (ppt) in 2023 from 321.35 ppt in 2022.
  - **Future Projection:** The HCFCs will return to their 1980 values in 2082 for radiative forcing and in 2087 for the EECI, as projected by the research.
  - **HCFC-22:** It is the most abundant HCFC in the atmosphere with a global warming potential 1,910 times that of carbon dioxide on a 100 year time horizon. It has witnessed the most significant decline resulting in a drop in the radiative forcing and EECI between 2021 and 2023.
  - **HCFC-22 usage:** It is used as a refrigerant in a variety of applications, including unitary air conditioners, cold storage, retail food refrigeration, chillers, and industrial process refrigeration.
- Hydrochlorofluorocarbons (HCFCs):
- HCFCs are compounds containing **carbon, hydrogen, chlorine and fluorine** and are viewed as acceptable temporary alternatives to **chlorofluorocarbons**.

- The HCFCs have shorter atmospheric lifetimes than CFCs and deliver less reactive chlorine to the stratosphere where the **“ozone layer”** is found.
- **Application:** They are used in the foam, refrigeration, and air conditioning sectors
- **International Legislation:** It mandates production caps for HCFCs; production is prohibited after 2020 in developed countries and 2030 in developing countries.
- **Other HCFCs:** A minor decline was also observed in HCFC-141b (the second most abundant) from 24.63 ppt in 2022 to 24.51 ppt in 2023.
- The third most prevalent, HCFC-142b, has been progressively declining since 2017.
- India is ahead of eliminating HCFCs in new equipment manufacturing, as claimed by the government in a report released during the **COP28 to UNFCCC** held in Dubai 2023.
- The Role of **Montreal Protocol** in curbing HCFC emissions.
- **The Copenhagen (1992) and Beijing (1999) Amendments** to the **Montreal Protocol mandates** the phase-out of HCFC production and usage.
- **Phase out Target:** The production of HCFCs is currently being phased out globally, with a completion date slated for 2040.

- **Role:** The Montreal Protocol enforced strict controls and promoted the adoption of ozone-friendly alternatives, curbing the release and levels of HCFCs into the atmosphere.

Global-Warming Potential (GWP):

- GWP is a term used to describe the relative potency, molecule for molecule, of a greenhouse gas, taking account of how long it remains active in the atmosphere.
- **Objective:** The measure was developed to allow comparisons of the global warming impacts of different gases. The larger the GWP of a gas, the more it warms the Earth as compared to CO<sub>2</sub> over that time period
- Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO<sub>2</sub>).
- **The global-warming potentials (GWPs) are calculated over 100 years.**
- Carbon dioxide is taken as the gas of reference and given a **100-year GWP of 1.**
- **Significance:** GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (e.g., to compile a national GHG inventory), and allows policymakers to compare emissions reduction opportunities across sectors and gases.

The Montreal Protocol:

- It was signed in **1987** and is a global agreement to protect the stratospheric ozone layer by **phasing out** the production and consumption of **ozone-**



**depleting substances (ODS)** by eliminating the production and consumption of ODSs like **chlorofluorocarbons (CFCs) and halons**.

- ODS are substances commonly used in products such as refrigerators, air conditioners, fire extinguishers, and aerosols.
- The worldwide production of CFCs has been prohibited since 2010.
- HCFCs were a replacement of CFCs but they were found to have a strong greenhouse gas potential and an ODSs.
- **Hydrofluorocarbons (HFC)**: They have become a substitute for HCFCs. They are **non-ozone depleting substances (ODS), but have high Global Warming Potential (GWP)**.
- **The Kigali Amendment to Montreal Protocol 2016**: It introduces strict restrictions on the manufacture and consumption of HFCs.
- **Global Cooling Pledge and the Paris Agreement**: Pledges have been made to cut HFC emissions, whose radiative force impact is rising in spite of the controls.

### **30 years of UN Land Convention**

17 June 2024 will mark the 30th anniversary of the **Bonn-based United Nations Convention to Combat Desertification (UNCCD)**.

**United Nations Convention to Combat Desertification (UNCCD)**

- It was adopted in 1994 and It is the first and only internationally legally binding framework set up to address the **problem of desertification**.
- It is based on the principles of participation, partnership and decentralization – the backbone of Good Governance.
- **Members** : There are 197 Parties to the Convention, including 196 country Parties and the European Union.
- **Focused areas** : It addresses specifically the arid, semi-arid, and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found.
  - Parties to the Convention meet in Conferences of the Parties (COPs) every two years, as well as in technical meetings throughout the year, to advance the aims and ambitions of the Convention and achieve progress in its implementation.
- **Status of India** : India became a signatory to UNCCD on 14th October 1994 and ratified it on 17th December 1996.
  - The Ministry of Environment, Forest and Climate Change is the nodal Ministry in the Government of India for the UNCCD, and Desertification Cell is the nodal point within the Ministry to coordinate all issues pertaining to the Convention.

**Greater Adjutant Stork**



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# GREATER ADJUTANT STORK

*Leptoptilos dubius*

## হাড়গিলা

**POPULATION**  
1,000 - 1,200

**HEIGHT** | **WINGSPAN**  
4-5 Feet | 8 Feet

**LIFESPAN**  
0 10 20 30 40 50 60 70 80

**FOOD HABITS**  
*These are primarily scavengers that eat carrion, but they also hunt fish, frogs, large insects, rodents, reptiles and birds as large as ducks. They can swallow and digest large pieces of bone. They are wetland dependent birds, which is a very important habitat for their survival.*

**HABITAT**  
*Colonial nesting birds and in India breeds in traditional nesting colonies in tall trees. Found in garbage dumps, wetlands, and paddy fields.*

**KAMRUP DISTRICT: THE GLOBAL STRONGHOLD**  
*The Kamrup District of Assam has the largest population of Greater Adjutant storks in the world and Assam has the global population stronghold with an estimated 850 birds! Dadara, Pachariya, Singimari villages of the Kamrup District has the largest nesting colony (208 nests) of Greater Adjutant storks in the world.*

**THE HARGILA ARMY**  
*Villagers from the Dadara, Pachariya and Singimari communities of the Kamrup District, Assam formed an all-women group called the Hargila Army which is now 400 members strong. Led by biologist Purnima Devi Barman of Aaranyak, they are saving Greater Adjutants through community efforts and pride!*



IUCN  
STATUS

ENDANGERED

*The global population has drastically declined.*

**FACTS**

- \* Once common in many Asian countries, this stork now breeds in only a few places in India and Cambodia.
- \* Assam is the global stronghold of this species with more than 75% of the global population.
- \* Approximately half of the world's breeding population nests in the Kamrup District, close to Guwahati.
- \* The storks in Assam prefer nesting near people, and are now regular features in village life during the breeding season.

- The greater adjutant stork also known as 'Garuda', one of the most endangered bird species, is facing severe threats due to rapid urbanization in Assam.
  - The Greater Adjutant Stork is also known as the "Hargila" in Assam, India.
  - They are known for their ability to soar high in the sky for long periods.
- **Scientific Name:** Leptoptilos dubius
- **Genus:** Part of the stork family, Ciconiidae, which includes about 20 species of large, long-necked birds.
- **Habitat:** Historically found across southern Asia and mainland Southeast Asia.
- Now mainly confined to small regions, primarily in Assam, India.
- There are three known breeding sites: one in Cambodia and two in India (Assam and Bihar).
- In Assam, they inhabit the Brahmaputra valley, especially in Guwahati, Morigaon, and Nagaon districts.
- In Bihar, a smaller population is found around Bhagalpur.
- **Protection Status:**
- **IUCN Red List:**Endangered
- **Wildlife (Protection) Act 1972:**Schedule IV
- **Diet:**
- Primarily carnivorous.

- Feeds on fish, frogs, snakes, other reptiles, eels, birds, offal, and carrion.
- Exhibits scavenging behavior similar to vultures.
- **Significance:**
- Regarded as the mount of Vishnu, a major deity in Hinduism. Revered by some as “Garuda Maharaj” (Lord Garuda) or “Guru Garuda” (Great Teacher Garuda).
- Assists farmers by killing rats and other farm pests.

**Conservation:**

- Several conservation organizations are working to protect the Greater Adjutant Stork, including the Bombay Natural History Society (BNHS) and the Assam Forest Department.
- Efforts include habitat restoration, captive breeding programs, and community education initiatives.

**Bioluminescent Mushrooms**

Recently, scientists discovered the **Filoboletus Manipularis**, a rare bioluminescent mushroom emitting a bright green glow at night in **Western Ghats region in Kerala**.

**Filoboletus Manipularis**

- It is part of the **Mycenaceae Family Fungi** and stands out for its **unique ability to produce light**.
- It exhibits this trait most prominently in its **stipe (stem) and pileus (cap)**, which emit a **greenish light** that can be observed during the night.

- The **high humidity and low light conditions** in the forests of Western Ghat create an **ideal environment for many bioluminescent species**.
- In general, **mushrooms** constitute **secondary saprophytic fungi** of the forest ecosystem that play a very important role in the **decomposition of plant litter**.
- **Biochemical Process in Filoboletus Manipularis**
- **Bioluminescence in fungi** is believed to attract insects that aid in spore dispersal, thus playing a crucial role in the **life cycle of these fungi**.
- The **glow** produced by the **chemical reaction** involving **luciferin (a pigment)** and **luciferase (an enzyme)**, with **oxygen** playing a critical role.
  - It is a trait shared with other bioluminescent organisms like **fireflies and certain marine creatures**.

### **Environmental Flows Monitoring System**

Recently, the Union Ministry of Jal Shakti launched the **Environmental Flows Monitoring System** developed by the **National Mission for Clean Ganga (NMCG)**

#### **Environmental Flows (E-flows) Monitoring System**

- It is a part of the comprehensive **PRAYAG Portal**, designed to **facilitate real-time analysis** and monitoring of water quality in rivers, particularly the **Ganga and its tributaries**.
- It enables authorities to **monitor river water quality, assess the impact of projects, and plan future initiatives** with greater precision and ecological consideration.

- It aims to evaluate **both natural influences and human-induced impacts** on water quality along India's coastline, addressing concerns related to industrial effluents, urbanisation, river discharge, and agricultural runoff.
- It is instrumental in **overseeing the activities of the Namami Gange Programme**, aimed at cleaning and protecting the Ganga.
  - It includes monitoring the performance of Sewage Treatment Plants (STPs) and other infrastructure critical to maintaining river health.
- It aligns with broader environmental efforts, such as those undertaken by INCOIS, which has unveiled a coastal water quality monitoring system.
- **Environmental Flows (E-flows)**
  - It is the **water regime** provided within a **river, wetland or coastal zone** to ecosystems and their benefits where there are competing water uses and which are regulated.
  - It is any managed change in a river's flow pattern intended to maintain or improve river health.

### Direct Seeding of Rice (DSR)

The Punjab government has been actively promoting the direct seeding of rice (DSR), or 'tar-wattar' technique.

- DSR is a relatively new technique that **involves direct seeding** of paddy seeds against the traditional practice of raising nurseries before planting the seedlings in the field.
- It requires no nursery preparation or transplantation.

- Paddy seeds are directly sown, roughly 20-30 days prior to when they would have been transplanted.
- The field is irrigated and laser leveled prior to the seeding process which is carried out using a seed drill or lucky seeder.
- **Benefits:** It saves groundwater, as opposed to the traditional water-intensive method, under which rice seedlings are transplanted from a nursery to waterlogged field
  - It is seen to be most productive, environmentally friendly and financially feasible rice production systems
  - It boosts yields, reduces costs, and addresses labour shortages for farmers.

### **Bonn Climate Change Conference**

The Bonn Climate Change Conference concluded after two weeks of intensive work across a range of issues where progress is needed on the path to the **UN Climate Change Conference (COP29)** in Baku, Azerbaijan.

#### **Bonn Conference**

- Bonn is the headquarters of the **United Nations Framework Convention on Climate Change (UNFCCC)** – the secretariat of the international treaty fighting climate change.
  - Discussions on **carbon markets** at the UNFCCC fora are grouped under Articles 6.2 and 6.4 of the Paris Agreement.



- This year's Bonn session follows COP28 in Dubai, where countries worked to finalise the first Global Stocktake of the Paris Agreement.

**Areas of progress in Bonn include:**

- Parties streamlined content going into the New Collective Quantified Goal on Climate Finance. Clear options and the substantive framework of a draft decision must be finalized before COP29.
- Parties took steps towards adaptation indicators that are forward-looking, effective, and scientifically sound.
- Progress was made towards a better functioning international carbon market, but further work remains to be done.
- Parties worked together for transparency and supported each other in planning stronger climate action plans.

**Do you know ?**

- The UNFCCC (or the Convention) and the Paris Agreement do not include a legal definition of 'developed' and 'developing' countries.
- The interpretation of the terms within these contexts has primarily been based on the grouping into 'Annex II' and 'Non-Annex I' Parties, set in 1992 at the time of the adoption of the Convention.
  - a. The former are the developed countries that must provide financial assistance to developing countries under the Convention.

b. Several of these Annex II nations are currently arguing that this categorisation is outdated in the NCQG context.

### **New Catalyst for cheaper biodiesel**

Scientists from Assam, Odisha, China, and UK have developed a water-repellent catalyst, that can cut the cost of producing “environmentally benign” biodiesel substantially.

Superhydrophobic catalysts imitate the anti-wetting or water-repulsing properties of natural surfaces such as lotus leaves.

*Hydrophobic surfaces are deemed crucial for leaves' ability to prevent water from poisoning active sites.*

- This catalyst stands out because of its unmatched robustness; it can withstand the water by-product during biodiesel production.
- Thus, it can be reused multiple times, making the catalytic process more efficient and cost-effective.
- It is derived from biomass (cellulose) and is ecologically benign, abundant, and highly affordable.
- At present, the cost of biodiesel in India is about ₹100 or UD\$1.2 per litre. Using the superhydrophobic activated carbon catalyst can bring down the cost to about 37 cents per litre.

### Sustainable Development Report, 2024

- The Sustainable Development Report, 2024, was released by the **UN Sustainable Development Solutions Network (SDSN)**.
- The UN Sustainable Development Solutions Network (SDSN) was set up in **2012** under the auspices of the **UN Secretary-General**.
- SDSN mobilizes global scientific and technological expertise to promote practical solutions for sustainable development, including the implementation of the **Sustainable Development Goals (SDGs)** and the **Paris Climate Agreement**.
- They work closely with **United Nations agencies, multilateral financing institutions, the private sector, and civil society**.
- **Key Findings**
- **None of the 17 SDGs will be achieved by 2030**. On average, only **16%** of SDG targets are **progressing well**.
- The situation is concerning for **zero hunger (SDG 2), sustainable cities and communities (SDG 11), life below water (SDG 14), life on land (SDG 15), & peace, justice and strong institutions (SDG 16)**.
- **Nordic countries** continue to **lead** in SDG achievement, and BRICS countries show some progress; **least developed nations** are **falling further behind**.
- The report introduced a **new index of countries' support for UN-based multilateralism (UN-Mi)**. It examined countries' engagement with the UN system.

- The index revealed a clear **correlation** between a country's **commitment to global cooperation and its progress on SDGs**.
- **Barbados** leads the list, while the **United States** ranks last. India stands at 139<sup>th</sup> place.

### **Recommendations**

- Need to **reform the global financial architecture**.
- Significant **investment in public goods** that **transcend national borders**.
- Establishment of a **United Nations Parliamentary Assembly (UNPA)** to strengthen the representation of "We the Peoples" at the UN.
- Institute **global taxation**, for example, on CO2 emissions, air and sea travel, financial transactions, and other international goods and 'bads,' in order to **mobilise sufficient global resources** to provide the necessary global public goods."
- Access to affordable **long-term capital** to invest in areas like **education (SDG 4)** for Low and middle-income countries.
- Implement innovative solutions like the **FABLE (Future of Agriculture, Biodiversity, Land-use, and Energy) pathways**: 1) reduce overconsumption and limit animal-based proteins; 2) invest in increasing productivity; and 3) create inclusive and transparent monitoring systems to stop deforestation.

### **Solid Waste Management (SWM) Cess**

The Bruhat Bengaluru Mahangara Palike (BBMP) has proposed a **Solid Waste Management (SWM) Cess** for each household. **Bengaluru** generates about **5,000 tonnes** of solid waste per day.

- **Urban Local Bodies (ULBs)** levy user fees or SWM cess according to the provisions of the **Solid Waste Management Rules, 2016**.
- According to these guidelines, ULBs must **collect user fees/cess** for SWM services provisions provided.
- While there is **no specified rate**, ULBs typically charge about ₹30-50 per month as SWM cess, which is collected **along with property tax**.
- **Financial strain of solid waste management**
- ULBs typically deploy about **80%** of their **manpower** and up to **50%** of their **annual budgets** to provide SWM services to city residents.
- Significant operational costs go towards salaries for waste collectors, drivers & processing plants.
- **Collection** and **transportation** are resource—and labour-intensive and consume up to 85-90% of the SWM budget. Only about 10-15% is spent on **processing** and **disposal** of waste.
- **Operational and revenue challenges**
- Solid waste generated in Indian cities consists of about **55-60% wet biodegradable material** and **40-45% non-biodegradable** material.
- Although **55%** of the **wet waste** can be converted into **organic compost** or biogas, the **yield** is as low as **10-12%**, making both composting and biogas generation from solid waste financially **unviable**.
- Typically, operational revenue from waste processing facilities **covers** only about **35-40% of operational expenses**, with the rest subsidised by the ULB.
- Additionally, **disposing of non-compostable and non-recyclable dry waste** is **expensive** because the material needs to be shipped to cement factories or waste-to-energy projects.

### Way forward

- **Segregation of waste at source:** It can increase yields from composting operations by up to 20%.
- **Reducing single-use plastic:** The increase in non-recyclable single-use plastics has posed significant challenges for ULBs.
- **Decentralised composting initiatives:** Residents in urban areas often oppose large-scale composting facilities due to odour and leachate issues.
  - Cities in **Tamil Nadu** and **Kerala** have successfully implemented **Micro Composting Centers (MCCs)** at the ward level, processing wet waste locally and reducing transportation costs.
- **Bulk waste generators to process their own waste:** Large institutions with adequate space can set up in-house waste processing facilities.

### Global Decline in DDT and Other POPs

A new study has revealed a decline in the levels of **Dichloro-diphenyl-trichloroethane (DDT)** and 11 other **Persistent Organic Pollutants (POPs)** in humans and the environment since 2004.

#### Key Findings

- The study, conducted under the **Global Monitoring Plan** implemented by the **UNEP** and funded by the **Global Environment Facility (GEF)**, monitored 30 POPs listed under the **Stockholm Convention**.
- The decline is attributed to **stricter regulations** implemented after the Stockholm Convention in 2004.
- For example, **DDT** concentrations in **human milk** samples have dropped by over **70%** globally since 2004 despite remaining the most prevalent POP in some regions.

- Despite the decline of some POPs, others post concern. **Dieldrin** and **polychlorinated biphenyls (PCBs)**, long-regulated chemicals, were detected at high levels in Africa, the Caribbean, and Latin America.
- Alarmingly, **chemical replacements** for banned POPs, found to have similar properties, have been detected at high levels. The report highlights **per- and polyfluoroalkyl substances (PFAS)**, including PFOS, PFOA, and PFHxS, exceeding EU and US standards in human milk and drinking water on remote islands.

### Blue Planet Prize

**Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)** is one of the two recipients of the **2024 Blue Planet Prize**. Prof. Robert Costanza is the other winner.

- An annual award by **Japan's Asahi Glass Foundation** includes an award of \$500,000.
- It is awarded to individuals and organisations working for **environmental conservation**.
- In **1992**, the year of the **Earth Summit**, the Asahi Glass Foundation **established** the Blue Planet Prize.

### IPBES

- IPBES is an **intergovernmental body** established in **Panama City** in 2012 by 94 Governments.

- It is **not** a **United Nations** body. **IPBES Secretariat: Bonn, Germany.**
- Aims to strengthen the science-policy interface for biodiversity and ecosystem conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.
- IPBES currently has more than **145 Member States**. Various NGOs and civil society groupings also participate in the formal IPBES process as observers.
- In the IPBES **Global Assessment Report** on Biodiversity and Ecosystem Services, invasive alien species were identified as one of the main direct drivers of biodiversity loss worldwide.

### **New Species of Snake Eel Discovered in Odisha**

The Zoological Survey of India (ZSI) have identified a new species of **snake eel** in Odisha.

- The new species has been named '**Ophichthus Suryai**' to honour **Surya Kumar Mohanty**, former joint director of the state fishery department.
- The new species can be distinguished from its closely related congeners by having the **dorsal fin origin** (DFO) just above or slightly anterior to the gill opening.
- It also has a unique **vertebral count** and **teeth patterns** on both jaws (maxilla and mandible).

#### **Snake Eels**

- Snake eels belong to the fish family **Ophichthidae**.



- They have an elongated, **snake-like body** with no pectoral and pelvic fins.
- Their **dorsal fin** runs along the back, beginning just behind the head and continuing to the tail.
- Snake eels are found in **tropical** and **subtropical marine environments**.
- Many species live in shallow coastal waters, coral reefs, and estuaries.
- There are over **200 species** of snake eels. E.g. Shortfin snake eel (*Ophichthus brevis*), Longfin snake eel (*Ophichthus cruentifer*), **Indian Ocean snake eel** (*Ophichthus rugosus*), etc.
- Snake eels are **nocturnal predators** that feed on **crustaceans** and **small fish**.

### **Zoological Survey of India**

- The Zoological Survey of India (ZSI) is a premier Indian organisation in **zoological research** and **studies**.
- It is under the **Ministry of Environment, Forest and Climate Change**.
- Established in 1916; **Headquarter:** Kolkata.
- The objectives of the ZSI are to promote **survey, exploration** and **research** leading to the advancement of our knowledge on various aspects of animal life.
- ZSI's main focus areas are **faunal exploration**, taxonomic studies, status surveys of **endangered species**, environmental impact assessment, conservation, and training.

- It has **16 regional centres** located across different geographic regions of the country.

### **Limbless Amphibian Found in Kaziranga**

A recent herpetofauna survey conducted in **Kaziranga National Park and Tiger Reserve** has led to the discovery of a new species of limbless amphibian, the striped **caecilian (Ichthyophis spp)**.

- **Caecilians** are limbless amphibians that spend most of their lives burrowed underground. They are ancient species and their presence provides valuable insights into evolution and intercontinental speciation.
- Reptiles and amphibians, collectively known as **herpetofauna**, are crucial for maintaining **ecological balance** and are considered indicator species for environmental health.

### **Kaziranga National Park**

- It is a National Park **located in Assam**.
- It is situated on the **banks of the Brahmaputra River** and lies between the **Brahmaputra River and the Karbi (Mikir) Hills**.
- Kaziranga is home to around **2/3rd of the world's Great Indian One-Horned Rhinos**. It is one of the last remaining homes of the endangered and endemic Western Hoolock Gibbon, the only species of apes found in India. It is one of the last homes of the **critically endangered Bengal Florican**.
- It is a part of the **Eastern Himalayan Biodiversity Hotspots**.
- The **Diphlu River** runs through it. National Highway 37 passes through it.

- It was designated as a National Park in 1974 and was declared a **Tiger Reserve** in 2006. It was designated a **UNESCO World Heritage site** in 1985. It has also been declared as an **Important Bird Area** by the **Birdlife International**.

### Environment Concerns in Great Nicobar Project

The Congress party has described the proposed Rs 72,000-crore infrastructure upgrade at the Great Nicobar project to the island's indigenous inhabitants and fragile ecosystem.

#### The Great Nicobar Project

- The Project involves developing an **International Container Transshipment Terminal (ICTT)**, an international airport, township development, and a **450 MVA gas and solar-based power plant** on the island.
- The ICTT is expected to allow Great Nicobar to **participate in the regional and global maritime economy** by becoming a major player in cargo transshipment.
- A proposed "**greenfield city**" will tap into both the maritime and tourism potential of the island.
- The site for the proposed ICTT and power plant is **Galathea Bay** on the southeastern corner of Great Nicobar Island, where there is no human habitation.
- **Strategic Importance of the Island**

- **The Malacca Strait**, the main waterway that connects the Indian Ocean to the Pacific, is very close to the islands of Andaman and Nicobar. Hence this can help India counter **China's 'String of Pearls'**
- **Sabang in Indonesia** is 90 nautical miles southeast of Indira Point (on Great Nicobar island), and **Coco Island in Myanmar** is 18 nautical miles from the northernmost tip of the Andamans.
- The islands share four of India's international maritime zone delimitations with **Myanmar, Thailand, Indonesia, and Bangladesh.**
- They also give India substantial ocean space under the **United Nations Conference on the Laws of the Sea (UNCLOS)** in terms of exclusive economic zone and continental shelf.
- **Andaman and Nicobar Islands**

– **Location:** The islands are located 1,300 km southeast of the Indian mainland in the Bay of Bengal.

a. It extends from 6° 45' N to 13° 41' N and from 92° 12' E to 93° 57' E.

– This archipelago is composed of more than 500 big and small islands, which are divided into two distinct groups of islands – **The Andaman Islands and the Nicobar Islands.**

a. **'Ten Degree Channel'** separates the Andaman Islands in the north from the Nicobar Islands in the south.

### **The Andaman Islands**

– These islands are divided into three major sub-groups – **North Andaman, Middle Andaman, and South Andaman.**

– The capital city of the Andaman & Nicobar Islands **Port Blair** is located in **South Andaman**.

### **The Nicobar Islands**

– These islands are divided into three major sub-groups – **Northern Group, Central Group, and Southern Group**.

- a. The Great Nicobar is the largest and the southernmost island in the group located in the Southern Group.
- b. India's southernmost point '**Indira Point**' is located at the southern tip of the Great Nicobar.

### **Other Features**

– Most of these islands have a volcanic base and are made of tertiary sandstone, limestone, and shale.

a. **The Barren and Narcondam islands**, north of Port Blair, are volcanic islands.

b. Some of the islands are fringed with coral reefs.

– **Saddle Peak (737 m)** in North Andaman is the highest peak in the Andaman and Nicobar Islands.

– The names of the following three islands were changed in 2018:

- a. Ross Island – renamed as Netaji Subhash Chandra Bose Dweep
- b. Neil Island – renamed as Shaheed Dweep
- c. Havelock Island – renamed as Swaraj Dweep

- **Environmental concerns of the Project**
- **Ecological Threats:**The destruction of forests and habitats poses a serious threat to the island's biodiversity, including various endemic and endangered species.
- **Rights Violation:**The project allegedly violates the rights of the **Shompen**, a Particularly Vulnerable Tribal Group (PVTG) of hunter-gatherers. The disruption of their traditional lands and lifestyle raises human rights concerns.
- **Inadequate Consultation:**Critics argue that the local administration has not sufficiently consulted the Tribal Council of Great and Little Nicobar Islands, as required by law.
- **Threat to Marine Species:** The construction and associated activities will destroy coral reefs, and would also have a cascading effect on the local marine ecosystem.
- **Volatile Zone:** The proposed port is situated in a seismically active zone that experienced a significant geological event during the 2004 tsunami, leading to concerns about the safety and long-term stability of the infrastructure in such a location.

#### **Way Ahead**

- In April 2023, the Kolkata Bench of the **National Green Tribunal (NGT)** declined to interfere with the environmental and forest clearance granted to the project.
- The Tribunal, however, ordered that a **high-power committee should be constituted** to look into the clearances.

### State of Global Air Report 2024

As per the **State of Global Air Report 2024**, Air pollution has caused 8.1 million deaths around the world in 2021.

#### Key Highlights of the Report

- **More than 90 percent** of these global air pollution deaths – 7.8 million people – are attributed to PM2.5 air pollution, including from ambient PM2.5 and household air pollution.
- **China and India** account for more than half of the global burden at 2.3 and 2.1 million deaths respectively.
- Air pollution was the **second leading risk factor for death** among children under 5 in 2021, after malnutrition.
- The report states that 489,000 deaths globally were attributable to **ozone exposure in 2021**.
- **99% of the world's population** lives in places with unhealthy levels of PM2.5 pollution.
- Air pollution is considered to be **one of the biggest killers globally**, second only to high blood pressure.
- **Scenario in India**
- India and China account for **55%** of the global burden deaths due to air pollution.
- Indians are also exposed to high levels of ozone. Short-term exposure to ozone has been linked to exacerbation of asthma and other respiratory symptoms while long term exposure is linked to Chronic Obstructive

Pulmonary Disease — a condition where the lungs remain inflamed obstructing the airflow.

- **Air Pollution**
- When harmful substances (pollutants) – particles, gases, or matter – are released into the air and reduce its quality, the air is polluted.
- **Common air pollutants include:** Particulate Matter (PM), Nitrogen Dioxide (NO<sub>2</sub>), Sulfur Dioxide (SO<sub>2</sub>), Ozone (O<sub>3</sub>), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Lead etc.
- **Source:** These pollutants can originate from natural sources such as volcanic eruptions and wildfires, but human activities such as industrial production, transportation, agriculture, and residential heating are significant contributors to air pollution.
- **Concerns:**
  - **Health Related:** Respiratory issues, cardiovascular problems, reduced lung function.
  - **Environmental:** Ecosystem damage, Biodiversity loss, Water pollution, climate change, crop damage.
  - **Healthcare Costs:** The health impacts of air pollution result in increased healthcare costs, including expenses related to the treatment of respiratory and cardiovascular diseases.
- **Steps Taken by Government of India to combat Air Pollution**
- **National Clean Air Programme (NCAP):** Launched in 2019, NCAP is a comprehensive initiative with the goal of reducing air pollution in identified cities and regions across India.



- The program focuses on improving air quality monitoring, implementing stricter emission standards, and promoting public awareness.
- **Bharat Stage VI (BS-VI) Emission Standards:** The government implemented BS-VI emission standards for vehicles nationwide in 2020.
  - These standards aim to reduce vehicular emissions by mandating the use of cleaner fuel and more advanced emission control technologies.
- **Pradhan Mantri Ujjwala Yojana (PMUY):** The PMUY scheme aims to provide clean cooking fuel to households by promoting the use of liquefied petroleum gas (LPG) as an alternative to traditional biomass-based cooking methods.
- **FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) Scheme:** The FAME scheme promotes the adoption of electric and hybrid vehicles to reduce air pollution caused by vehicular emissions.
  - Incentives are provided to both manufacturers and consumers to encourage the use of electric vehicles.
- **Green Initiatives for Sustainable Habitat (GRIHA):** GRIHA is an initiative to promote sustainable and environmentally friendly practices in the construction and operation of buildings.
  - It encourages the use of energy-efficient technologies and materials to reduce pollution.

- **Waste Management Programs:** Proper waste management is crucial to prevent the burning of waste, which contributes to air pollution.
  - Various waste management initiatives, including the Swachh Bharat Abhiyan, aim to address solid waste issues and promote cleaner disposal methods.
- **Commission for Air Quality Management:** The Commission has been set up for Air Quality Management in the National Capital Region and Adjoining Areas for better coordination, research, identification, and resolution of problems surrounding the air quality index.

### World Bank's Global Gas Flaring Tracker Report

As per the World Bank's Global Gas Flaring Tracker Report, in 2023, the amount of gas flared worldwide rose by nine billion cubic meters (bcm) to 148 bcm, its highest level since 2019.

#### Gas flaring:

- It is the burning of the **natural gas** associated with **oil extraction**.
- The practice has persisted from the beginning of oil production over 160 years ago.
- It takes place due to a range of issues, from market and economic constraints, to a lack of appropriate regulation and political will.

- Flaring and venting are a **waste of a valuable natural resource** that should either be used for productive purposes, such as generating power, or conserved.
- *Why is gas flared?*
- Flaring persists to this day because it is a relatively safe, though wasteful and polluting, method of disposing of the associated gas that comes from oil production.
- **Impacts on environment**
- The flare's combustion converts hydrocarbons to carbon dioxide and water, which lessens the climate impact and reduces the safety concerns of the natural gas on site but also produces **nitrogen oxides, or NOx**.

**In recent times biomass briquettes are being used as a fuel alternative for the power and electricity generation sector.**

**Biomass briquettes:**

- These are made up of **compact blocks of organic materials**, such as agricultural residues, forestry wastes, or industrial by-products.
- Applications: These are used for heating, cooking fuel, and electricity generation usually in developing countries that do not have access to more traditional fuel sources.
- **Advantages:**
- Environment Friendly: Bio-briquettes can be created from easily available biomass waste often found in rural settings.

- Affordable: These can be made by hand from any freely available organic matter, including invasive species and agro-waste.
- Biomass briquettes are **carbon-neutral**, meaning they release no additional carbon dioxide into the atmosphere when burned.
- By reducing reliance on fossil fuels, the adoption of biomass briquettes helps **mitigate greenhouse gas emissions**, thus contributing to climate change mitigation efforts.
- By diverting residues towards productive use, biomass briquettes play a crucial role in waste management and carbon sequestration, further enhancing their environmental credentials.

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

Himalayan serow:

- It resembles a cross between a goat, a donkey, a cow, and a pig.

Types:

- There are several species of serows, and all of them are found in Asia.
- The Himalayan serow, or **Capricornis sumatraensis thar**, is restricted to the Himalayan region. Taxonomically, it is a subspecies of the mainland serow (*Capricornis sumatraensis*).
- **Diet**: These are **herbivore species**.
- **Distribution**: These are typically found at altitudes between 2,000 metres and 4,000 metres (6,500 to 13,000 feet). They are known to be found in

eastern, central, and western Himalayas, but not in the Trans Himalayan region.

Conservation Status:

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

Key facts on Nameri Tiger Reserve:

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

**7 NATIONAL PARKS IN ASSAM**

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

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## GEOGRAPHY

### **PLEASE (Plastic Free Rivers and Seas of South Asia) program-A river cleanup campaign.**

A river cleanup campaign that removed 24,575 kg of waste from the Sunkoshi River banks and waste hotspots was recently completed under the PLEASE (Plastic Free Rivers and Seas of South Asia) program.

#### PLEASE program:

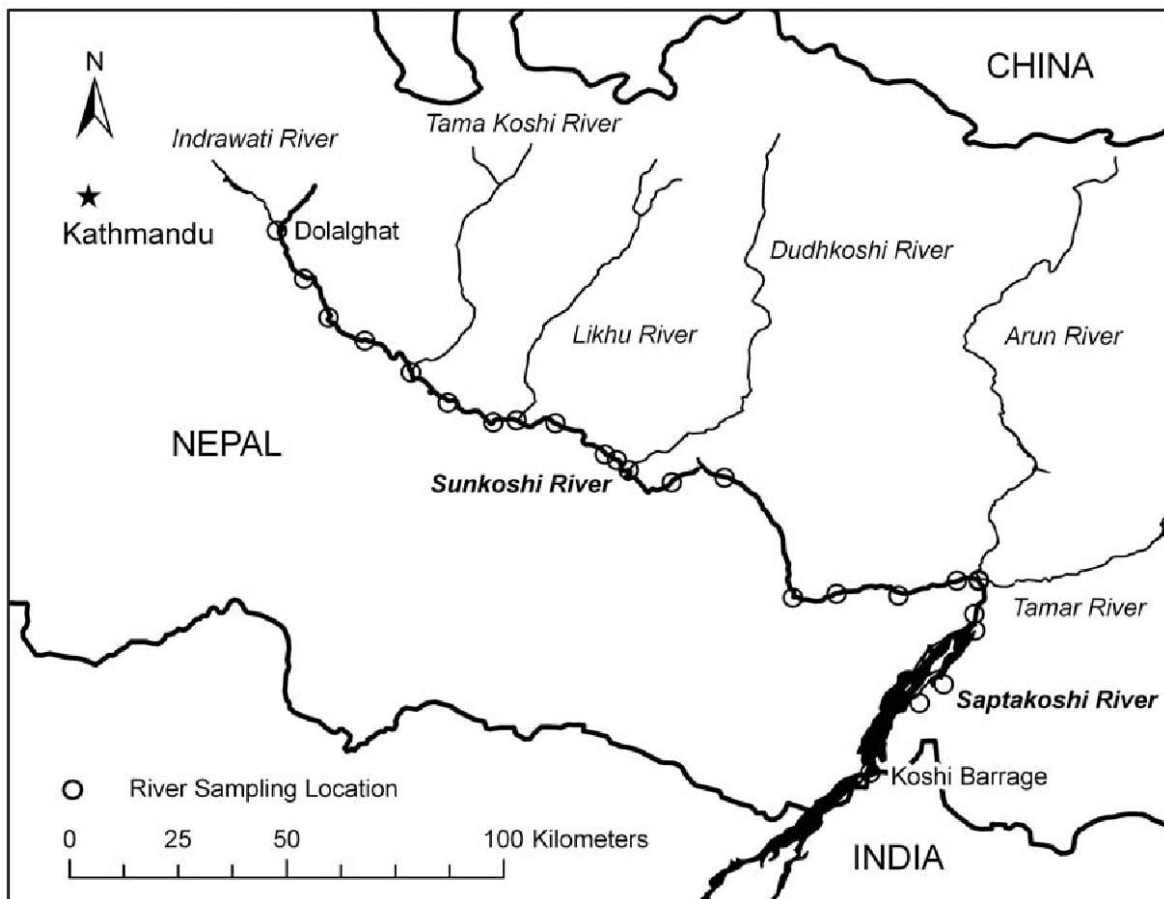
- This project is implemented by the **South Asia Cooperative Environment Programme (SACEP)**, with the support of the **United Nations Office for Project Services (UNOPS)**, and the **World Bank**. The project development objective of the Plastic Free Rivers and Seas for South Asia (PLEASE) Project is to catalyze actions that reduce the flow of plastic pollution into South Asian Seas.

#### Sunkoshi River:

- Sunkoshi, also known as **the 'river of gold'**, is a river in Nepal that is part of the **Koshi or Saptkoshi River** system formed by the seven (sapta) rivers joining in east-central Nepal.
- **Course:** River Sunkoshi's water source is located in the **Zhangzangbo Glacier in Tibet**, which merges with River Saptkoshi, ultimately joining the Ganga in **the Katihar district of Bihar** in India, before finally draining into the ocean at the Bay of Bengal in Bangladesh.



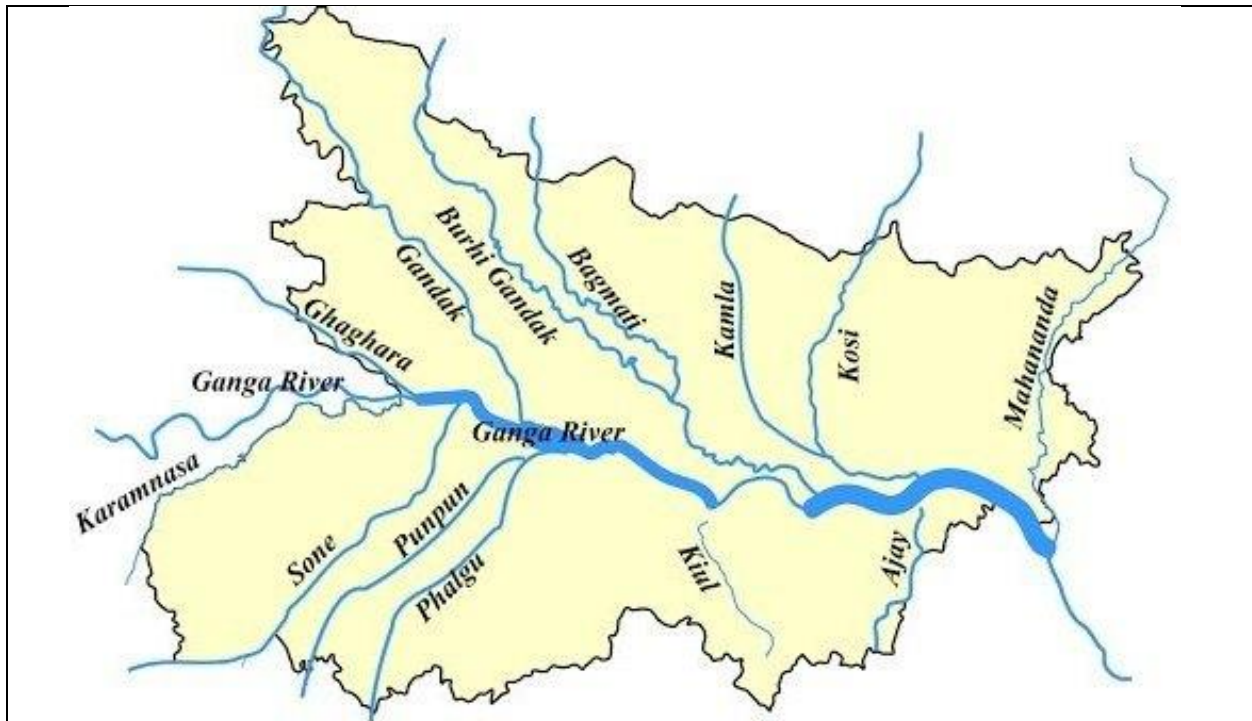
- It is one of the longest and most popular rivers for rafting in Nepal, and is known for its challenging rapids.
- It forms the watershed for most of eastern Nepal.



Koshi River:

- It is a **transboundary river** which flows through China, Nepal, and India.
- It is a **prominent tributary of the Ganges**.

- **Course:** Originating from the **Tibetan Plateau**, it crosses the Himalayas and flows through the **Mahabharat range and Siwalik hills**, reaching the plains of eastern Nepal and finally meeting the Ganges in Bihar, India.
- The Kosi drains an area of 74,500 sq.km, of which only 11,070 sq.km lie within Indian Territory. The Koshi River system drains about 45% of Nepal.
- The Kosi River valley is bounded by steep margins that disconnect it from the **Yarlung Zangbo River to the north, the Mahananda River to the east, the Gandaki to the west**, and the Ganga to the south.
- It is well known for its tendency to change course, generally in a westward direction. During the last 200 years, the river has shifted westwards for a distance of about 112 km and has laid waste large tracks of agricultural land
- Kosi is known as the "**sorrow of Bihar**", as it has caused widespread human suffering in the past due to flooding and very frequent changes in course, when it flows from Nepal to Bihar.
- **Tributaries:** It has seven major tributaries: Sun Koshi, Tama Koshi or Tamba Koshi, Dudh Koshi, Indravati, Likhu, Arun, and Tamore or Tamar.



**Scientists recently unearthed living stromatolites—ancient geological structures made from algae—on Sheybarah Island, nestled on the northeastern shelf of the Red Sea in Saudi Arabia.**

Stromatolites:

- Stromatolites, or **stromatoliths**, are layered accretionary structures formed in shallow water by the trapping, binding, and cementation of sedimentary grains by **biofilms of microorganisms**, especially cyanobacteria (commonly known as **blue-green algae**).

- As sediment layered in shallow water, bacteria grew over it, binding the sedimentary particles and building layer upon millimetre layer until the layers became mounds.
- These structures are usually characterized by thin, alternating light and dark layers that may be flat, hummocky, or dome-shaped.
- Stromatolites were common in **Precambrian time** (i.e., more than 542 million years ago).
- Most stromatolites are marine, but some forms from **Proterozoic strata** more than 2 ½ billion years old are interpreted as inhabiting intertidal areas and freshwater ponds and lakes.
- **Living stromatolites** are found in only a few salty lagoons or bays on Earth.
- Western Australia is internationally significant for its variety of stromatolite sites, both living and fossilised.
- **Shark Bay in Western Australia** is one of only two places in the world where living marine stromatolites exist.

Importance:

- Stromatolites provide some of the most ancient records of life on Earth by fossil remains which date back more than **3.5 billion years ago**.
- Further, these biotic structures were instrumental in the **Great Oxygenation Event** over two billion years ago, introducing oxygen into the atmosphere and transforming the planet's habitability.

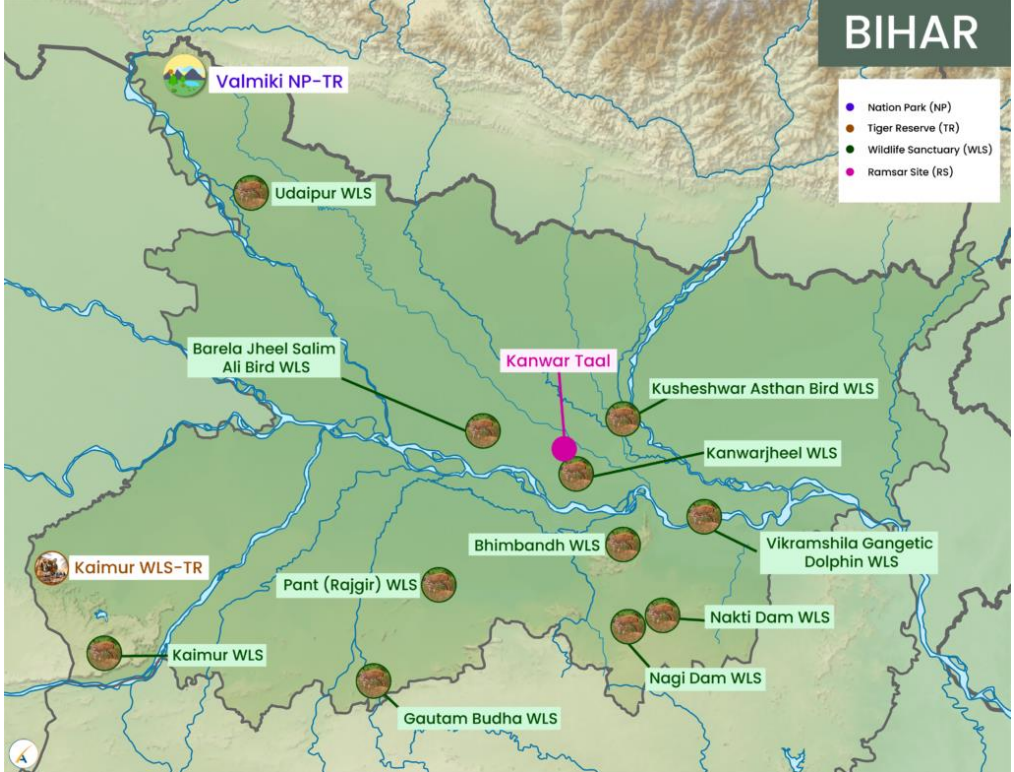
- Being photosynthetic, cyanobacteria produce oxygen as a by-product. Photosynthesis is the only major source of free oxygen gas in the atmosphere.
- As stromatolites became more common 2.5 billion years ago, they gradually changed the Earth's atmosphere from a carbon dioxide-rich mixture to the present-day oxygen-rich atmosphere.
- This major change paved the way for the next evolutionary step, the appearance of life based on the *eukaryotic cell* (cell with a nucleus).

**Recently, 2 Human-made wetlands from Bihar, The Nagi and Nakti Bird Sanctuaries, have been recognised as wetlands of international importance under the Ramsar Convention.**

- Two bird sanctuaries of Bihar added to **Ramsar list**.
- The sites were declared on the **World Environment Day (5 June 2024)**.
- India now hosts **82 Ramsar wetland** sites with this inclusion.
- Currently, the highest number of such sites is in the **UK (175)**, followed by **Mexico (144)**.
- **Kanwar Lake** in Begusarai district was designated **Bihar's first Ramsar Site in 2020**.
- Tentative sites for Inclusion from Bihar: Kusheshwar Asthan in Darbhanga, Tal Baraila in Vaishali, Gogabeel in Katihar, Nagi and Nakati dams in Jamui.

*Nagi and Nakti Bird Sanctuaries:*

- The wetland was designated as a **Bird Sanctuary in 1984**.
- **Location:** The wetlands are deemed protected areas in the **Jhajha forest range of Bihar's Jamui district**.
- **Size:** They are spread across 791 and 333 hectares, respectively.
- **Human-made:** The Nagi and Nakti bird sanctuaries are **human-made wetlands** that were developed primarily for irrigation purposes through the construction of the **Nakti Dam**.
- **Wildlife support:** The sanctuary supports globally threatened species, including the endangered Indian elephant (*Elephas maximus indicus*) and a vulnerable **native catfish (Wallago attu)**.
- **The catchment area:** It is a largely dry deciduous forest surrounded by hills.
- **Wintering Habitat for Migratory Birds:** Over 20,000 birds congregate during the winter months, including one of the largest congregations of **red-crested pochards** (*Netta rufina*) on the Indo-Gangetic plain.
- As per **Asiatic Waterbird Census(AWC) 2023:** The Nakti bird sanctuary is the wetland with the highest number of birds reported with a count of 7,844 birds, followed by Nagi bird sanctuary with 6,938 birds.



The map displays the state of Bihar with various protected areas marked. A legend in the top right corner identifies the symbols: a purple dot for Nation Park (NP), an orange dot for Tiger Reserve (TR), a green dot for Wildlife Sanctuary (WLS), and a pink dot for Ramsar Site (RS). The Ramsar site, Kanwar Taal, is highlighted with a pink dot and a pink line. Other protected areas shown include Valmiki NP-TR, Udaipur WLS, Barela Jheel Salim Ali Bird WLS, Kaimur WLS-TR, Kaimur WLS, Pant (Rajgir) WLS, Gautam Budha WLS, Bhimbandh WLS, Kanwarjheel WLS, Kusheshwar Asthan Bird WLS, Vikramshila Gangetic Dolphin WLS, Nakti Dam WLS, and Nagi Dam WLS.

Ramsar Convention:

- **Establishment:** A Ramsar site is a **wetland of international importance** under the Ramsar Convention (also known as the **'Convention on Wetlands'**), an intergovernmental environmental treaty established by **UNESCO in 1971** and named after the city of **Ramsar in Iran**, where the convention was signed that year.
- **Identification:** Ramsar recognition is the identification of wetlands that are of international importance, especially if they provide habitat to waterfowl (about 180 species of birds).

- First Ramsar Site in India: **Chilika Lake** in Orissa and **Keoladeo National Park** in Rajasthan
- **Largest Ramsar Site in India: Sundarbans in West Bengal**  
Wetlands:
- **A Saturated Ecosystem:** A wetland is where the land is covered by water (salt, fresh, or somewhere in between) seasonally or permanently. It functions as its own **distinct ecosystem**.
- **Consists Of:** They include mangroves, marshes, rivers, lakes, deltas, floodplains and flooded forests, **rice fields, coral reefs**, marine areas no deeper than **6 meters at low tide**, as well as **human-made wetlands** such as waste-water treatment ponds and reservoirs.
- **Contribution:** They cover only around 6% of the Earth's land surface, but about 40% of all plant and animal species live or breed in wetlands.

### **Pantanal Wetland**

- The Pantanal wetlands in Brazil are experiencing an alarming increase in wildfires due to exceptionally dry weather patterns.
- The Pantanal, situated in the heart of South America, is the world's largest tropical wetland.
- It primarily lies within Brazil but extends into Bolivia and Paraguay. It is a unique and complex ecosystem, characterized by its seasonal flooding cycles.
- It is a UNESCO World Natural Heritage Site and Biosphere Reserve, indicating its global importance for biodiversity and conservation. It also encompasses two Ramsar sites, recognizing its significance as a wetland habitat.



### ICIMOD, Report 2024 on Hindu-Kush Himalayan

According to the Snow Update Report 2024 from the International Centre for Integrated Mountain Development (ICIMOD), snow persistence in the Hindu Kush Himalaya (HKH) region was notably below normal levels this year.

#### ICIMOD

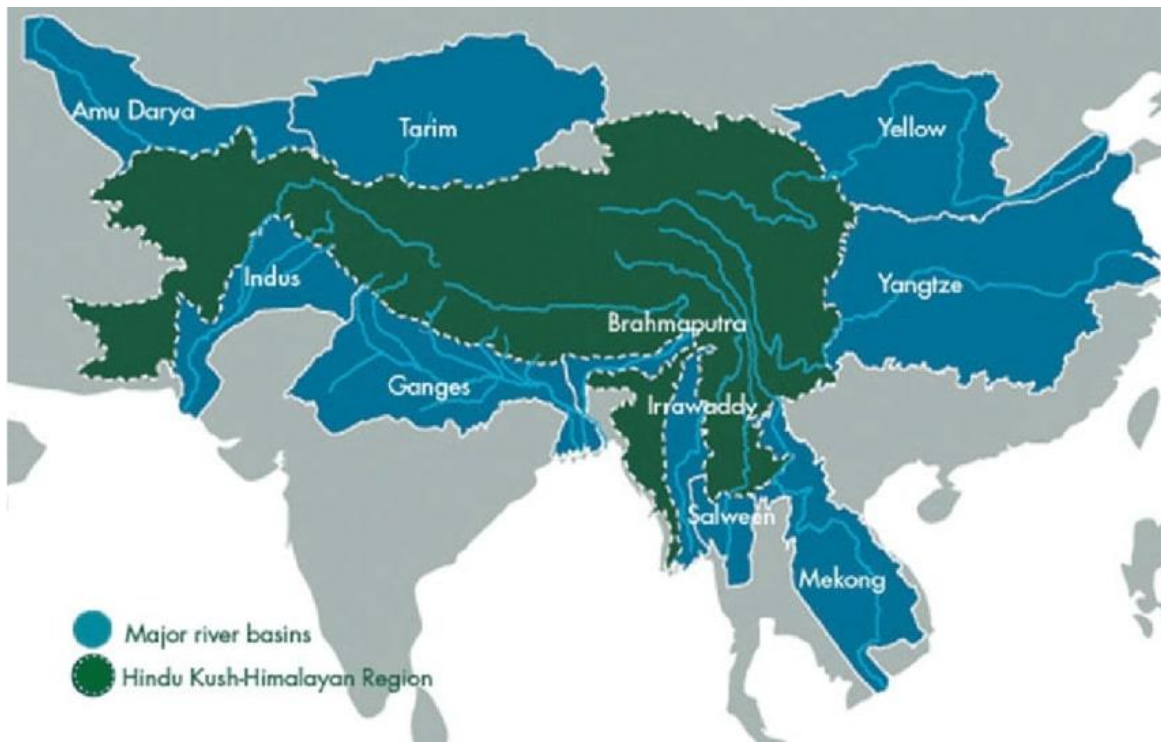
- **The ICIMOD** is an intergovernmental organization dedicated to advancing knowledge and promoting sustainable development in the Hindu Kush Himalaya (HKH) region.
- **Mission:** ICIMOD serves the interests of the HKH people by fostering regional cooperation and facilitating the exchange of knowledge and resources.
- **Location:** It is headquartered in Kathmandu, Nepal, strategically situated in the heart of the HKH region.
- **Regional Member Countries:** Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan are the member countries collaborating under ICIMOD's initiatives and program.
- **Key Findings of the ICIMOD Report:**
  - *Comparison with Historical Records:* The report analysed snow persistence in the Hindu Kush Himalaya (HKH) region from 2003 to 2024 and compared snow persistence in November 2023-April 2024 with historical averages.
  - *Below-average Snow Cover:* The Indus, Ganga, and Brahmaputra river basins experienced reduced snow cover, with decreases of 23%, 17%, and 15% respectively compared to the average from 2003-2023.

- *Dramatic Fall in Specific Basins:* The Helmand River basin, originating from the HKH region and flowing into Afghanistan and Iran, saw a significant 31.8% decrease in snow persistence. The Amu Darya river basin, one of Central Asia's longest rivers, experienced its lowest snow persistence with a notable 28.2% decrease below normal levels.
- *Consistent Trend:* Over the past 22 years, 13 have recorded below-average seasonal snow persistence in the HKH region, indicating a consistent trend of decreasing snow amounts and duration in 2024.
- *Regional Trends:* There is a gradient of decreasing below-average snow persistence from east to west across the HKH region, with the most pronounced declines observed in the western regions, where snow's contribution to water supply is significant.
- *Implications for Water Security:* Below-average snow accumulation poses a substantial risk to early summer water availability this year, affecting water security in the region.

**Way forward:**

- *Proactive Stakeholder Engagement:* Stakeholders must take proactive steps to address challenges, mitigate potential water shortages, update plans to manage water stress effectively, and communicate risks to communities.
- *Prompt Implementation of Drought Management Strategies:* Governments need to swiftly implement drought management strategies to safeguard water resources and support communities during periods of reduced precipitation.
- *Enhanced Water Management:* Promoting rainwater collection for irrigation and other activities can significantly enhance water management practices, improving resilience to water scarcity.

- *Collaborative Water Governance:* Countries sharing transboundary rivers should collaborate to revise and strengthen water management laws, ensuring long-term resilience to climate change impacts on water resources.



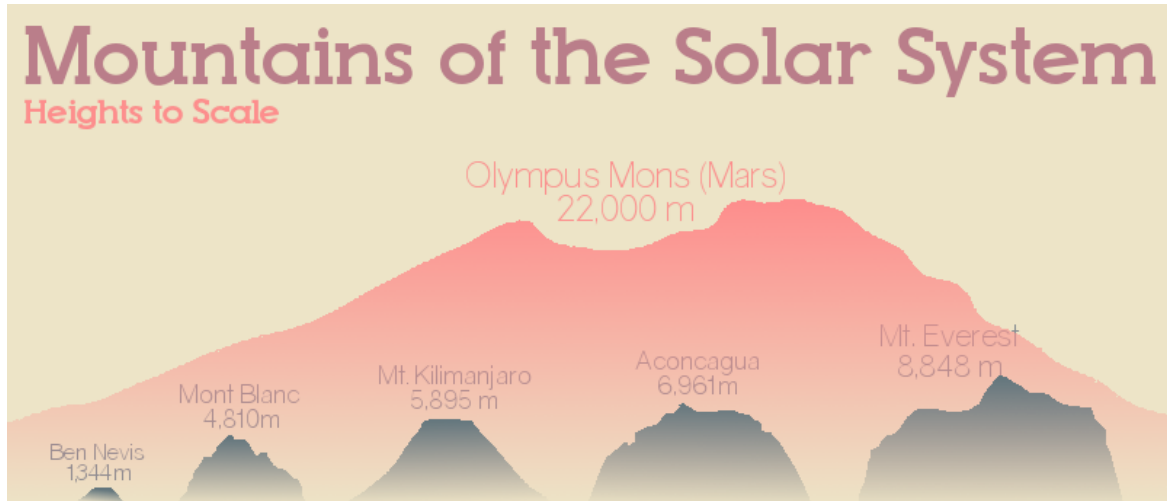
### **Hindu Kush Himalaya Region**

**Extent of the Region:** The Hindu Kush Himalaya (HKH) region spans 3,500 km, covering parts of eight countries: Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.

- **Source of Major Rivers:** It serves as the source for ten major river systems in Asia: the Amu Darya, Indus, Ganges, Brahmaputra (Yarlungtsanpo), Irrawaddy, Salween (Nu), Mekong (Lancang), Yangtse (Jinsha), Yellow River (Huanghe), and Tarim (Dayan).
- **Dependency on the Cryosphere:** The HKH region heavily relies on the cryosphere, which includes snow, permafrost, and ice from glaciers, lakes, and rivers.
- **Critical Freshwater Source:** This frozen water is crucial for providing freshwater to approximately 240 million people living in the HKH region and offers significant benefits downstream.
- **Contribution to Water Flow:** Snowmelt contributes about 23% of the total water flow in 12 major river basins originating from the HKH, ensuring water availability for agriculture, industry, and domestic use downstream.

### Olympus Mons

Recently, water frost has been observed on the towering Tharsis volcanoes, including the massive Olympus Mons near Mars's equator, marking the first detection of such frost in this region.



### **Olympus Mons**

- Olympus Mons is a shield volcano located in Mars' western hemisphere.
- It stands as the highest point on Mars and holds the title of the largest known volcano in the solar system.
- Rising to a height of 16 miles (24 kilometres), it towers approximately three times higher than Mt. Everest.
- With a diameter of 340 miles (550 kilometres), Olympus Mons covers an area larger than the entire Hawaiian Islands chain.
- By comparison, Earth's largest volcano, Mauna Loa in Hawaii, spans 120 kilometres across and reaches 9 kilometres in height.
- Olympus Mons is estimated to be around 3.5 billion years old, forming early in Mars' history.

- The volcano features a very gentle slope, ranging only between 2 to 5 degrees, giving it a remarkably flat appearance.
- At its summit lies a caldera, a large depression resulting from volcanic activity, which spans approximately 50 miles (80 kilometres) wide.
- This caldera is composed of several overlapping pits formed during different eruptive phases.
- In contrast, many Earth-based volcanoes typically exhibit a simpler, single caldera structure.

#### **Why are the mountains so tall?**

- **Limited Plate Movement:** Mars experiences minimal tectonic activity, with both the hot spot and crust remaining relatively stationary. This lack of movement allows lava to accumulate in one location, forming large volcanoes like Olympus Mons instead of volcanic island chains typical on Earth.
- **Extended Lifespan:** Martian volcanoes maintain continuous activity over millions of years, resulting in a steady accumulation of magma in specific areas on Mars' surface.
- **Shield Volcano Type:** Olympus Mons is a shield volcano, characterised by its gentle eruption style where lava flows slowly down its sides rather than erupting violently. This type of volcano contributes to Olympus Mons' broad, squat appearance with an average slope of only 5 percent.
- **Structural Features:**

- **Calderas:** At the summit of Olympus Mons, six collapsed craters, known as calderas, are stacked on top of each other, creating a depression measuring 53 miles across.
- **Outer Escarpment:** Surrounding the volcano's perimeter is a cliff or escarpment that rises as high as 6 miles (10 km) above the surrounding terrain. This cliff alone matches the height of Earth's Mauna Loa volcano.
- **Base Depression:** The base of Olympus Mons is marked by a wide depression formed as the immense weight of the volcano presses into Mars' crust
- **Ephemeral Frost Discovered on Mars' Olympus Mons:**
- Ephemeral frost has been discovered on Mars' Olympus Mons, with approximately 150,000 tonnes of water cycling daily, according to findings from the European Space Agency's ExoMars Trace Gas Orbiter (TGO) NOMAD instrument.
- The frost was initially detected atop the Olympus Mons volcano by the ExoMars Trace Gas Orbiter's NOMAD instrument.
- The Mars Express orbiter further confirmed the unexpected presence of frost across multiple volcanoes in the Tharsis region.
- The frost patches are remarkably thin, about the width of a human hair, and cover extensive areas within the summit calderas of these volcanoes.
- This amount of frost translates to 150,000 tonnes of water exchanging between the surface and atmosphere each day during Mars' cold seasons, equivalent to 60 Olympic-sized swimming pools.

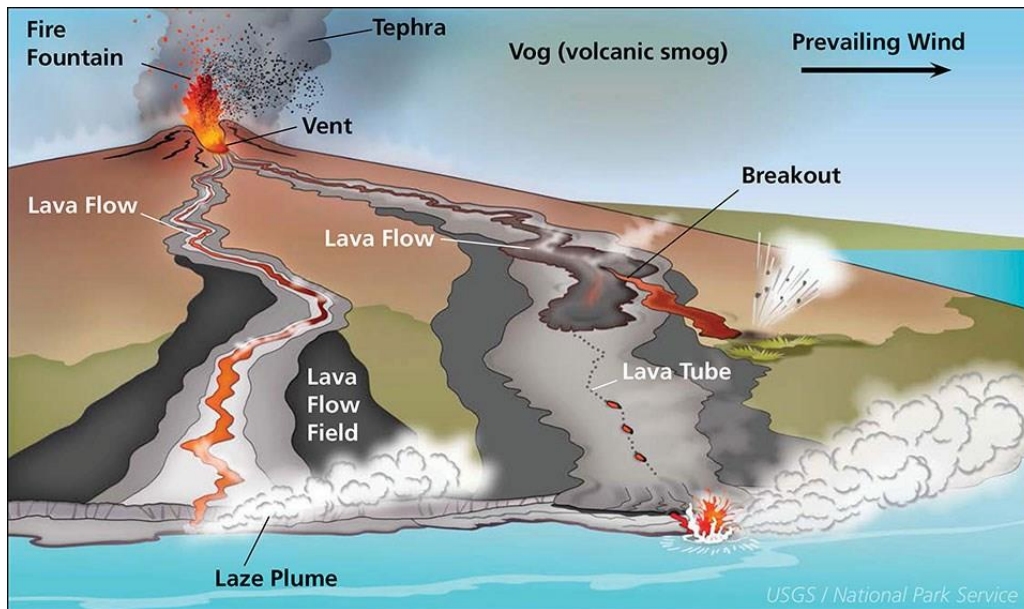
- The frost is transient, present for only a few hours around sunrise before evaporating in the daylight, highlighting unique microclimates within the deep volcanic calderas.
- Understanding the formation of this ephemeral frost provides insights into Mars' atmospheric dynamics and potential locations of liquid water, crucial for future robotic and human exploration missions.

### Shield Volcano

- **Size and Shape:** Shield volcanoes rank as Earth's largest volcanoes, characterized by their expansive size and broad, gently sloping sides. Unlike composite volcanoes, they lack steep, conical peaks.
- **Composition:** These volcanoes are predominantly composed of basalt, a type of lava known for its high fluidity when erupted.
- **Lava Characteristics:** Due to basalt's low viscosity, it flows easily on the surface. During eruptions, this fluid lava travels significant distances away from the volcano's vent.
- **Formation:** Shield volcanoes develop over extended periods through repeated eruptions that occur intermittently, gradually building up layers of lava.
- **Eruption Behaviour:** Eruptions at shield volcanoes are typically non-explosive unless water enters the vent, which can lead to steam-driven explosions. Normally, eruptions feature low-explosivity fountaining that constructs cinder cones and spatter cones around the vent.
- **Famous Examples:** The Hawaiian Islands boast some of the most well-known shield volcanoes globally, such as Mauna Loa and



Mauna Kea, which have significantly shaped the islands' landscapes over millions of years.



### Bayesian Convolutional Neural Network (BCNN)

Recently, **Indian National Centre for Ocean Information Services (INCOIS)** has developed the **Bayesian Convolutional Neural Network (BCNN)** to predict the emergence of El Nino and La Nina conditions up to 15 months in advance.

- **BCNN** is cutting-edge technology that harnesses the power of **Artificial Intelligence (AI)**, **deep learning**, and **machine learning (ML)** to enhance **predictions** related to the **El Niño-Southern Oscillation (ENSO) phases**.

- The **BCNN model** is particularly adept at **predicting El Nino or La Nina events** due to its **ability to account for the slow oceanic variations** and their atmospheric coupling.
- It calculates the **4 Index Value**, a critical metric **used in ENSO phase prediction**, with improved precision which is obtained by averaging the sea surface temperature (SST) anomaly in the central equatorial Pacific, extending from 5°N to 5°S, and 170°W to 120°W.
- It offers a promising **future** for more **reliable and timely weather predictions**, which are vital for agriculture, fisheries, and disaster management.
- It is a combination of the **dynamic model with AI that** helps it forecast the emergence of El Niño and La Niña conditions with a **15-month lead time** — unlike **other models** which can give a **prediction up to six to nine months in advance**.

### **INCOIS**

- It was established as **an autonomous body** in 1999 under the **Ministry of Earth Sciences (MoES)** and is a unit of the **Earth System Science Organisation (ESSO)**.
  - It is mandated to provide the best possible ocean information and advisory services to society, industry, government agencies and the scientific community through sustained ocean observations and constant improvements through systematic and focussed research.

### **Weather Models**

- There are largely **two kinds of weather models** used for forecasting,

ie:

- **Statistical Model:** It generates forecasts based on various information sets received from different countries and regions
- **Dynamic Model:** It involves a 3D mathematical simulation of the atmosphere done using **High Performance Computers (HPC)**.
  - a. It is much **more accurate** than the statistical model.

### **El Nino-Southern Oscillation (ENSO)**

- It is a climate phenomenon which involves changes in the temperature of waters in the central and eastern tropical Pacific Ocean, coupled with fluctuations in the overlying atmosphere.
  - a. It can alter the global atmospheric circulation, which, in turn, influences weather across the world.
  - It occurs in irregular cycles of 2-7 years and has **three different phases — warm (El Nino), cold (La Nina), and neutral.**
    - b. **Neutral Phase:** The eastern side of the Pacific Ocean (near the northwestern coast of South America) is cooler than the western side (near the Philippines and Indonesia). This is due to the prevailing wind systems that move from east to west, sweeping the warmer surface waters towards the Indonesian coast. The relatively cooler waters from below come up to replace the displaced water.
    - c. **El Nino (Warm Phase):** Wind systems weaken, leading to lesser displacement of warmer waters. As a result, the eastern side of the Pacific becomes warmer than usual, and trade winds — east-west winds that blow near the Equator — weaken. Normally, easterly trade winds blow from the Americas towards Asia.

Due to El Niño, they falter and change direction to turn into westerlies, bringing warm water from the western Pacific towards the Americas.

d. **La Nina (Cold Phase):** La Nina is the opposite of El Nino. It is cooler than average sea surface temperature (SST) in the equatorial Pacific region. Trade winds are stronger than usual, pushing warmer water towards Asia.

– **In India**, while **El Nino conditions** usually **lead to a weak monsoon and intense heat waves**, **La Nina conditions result in a strong monsoon.**

### **Alaknanda River**

Fourteen people were killed after a traveler plunged into Alaknanda River in Uttarakhand's Rudraprayag district.

It rises at the confluence and foot of the Satopanth and Bhagirath Kharak glaciers in Uttarakhand.

- It is one of the two headstreams of the river Ganga.
- **At Vishnuprayag** it meets **Dhauliganga**, a left bank tributary, and travels west to the town of Joshimath.
- **At Nandprayag** it meets Nandakini River, a left bank tributary, meets with the Alaknanda River.
- **At Karanprayag**, the Pindar River, a left bank tributary, meets with the Alaknanda River.
- **At Rudraprayag**, it meets with the Mandakini River, a right bank tributary.
- **At Devprayag** the Alaknanda River converges with the **Bhagirathi River** and travels onward as the Ganges River.

### Earth's Inner Core Rotation Slowing Down

- A new study has provided compelling evidence that the Earth's solid inner core, composed of iron and nickel, began to slow down its rotation compared to the planet's surface in 2010.
- Since the Earth's core and most part of the Earth's interior is physically inaccessible, researchers typically study it by analysing seismic waves generated by earthquakes recorded on seismograms.

#### Impacts

- The process could potentially change the length of a day on Earth by fractions of a second.
- The inner core's spin is influenced by the magnetic field generated in the liquid outer core and gravitational effects within the Earth's mantle.
- The inner core's rotation generates Earth's magnetic field and influences geological processes. Changes in its rotational speed could affect Earth's magnetic properties and geomagnetic events.
- The recent study says that the inner core is reversing and backtracking relative to the surface, rotating slower than the mantle for the first time in about 40 years.

#### Connection to Climate Change and Earth's Rotation

- A separate study (Nature Journal) found that climate change-driven melting of ice in Greenland and Antarctica was affecting global timekeeping by slowing down Earth's rotation.

- The liquid core was slowing down, causing the solid Earth to rotate faster to counterbalance the effect, resulting in fewer 'leap seconds' being needed to be added to the Coordinated Universal Time (UTC).
- Since 1972, a 'leap second' has been periodically added to the UTC to account for irregularities in Earth's rotation speed.

### **Coordinated Universal Time (UTC)**

- UTC is the primary time standard by which the world regulates clocks and time. It is based on precise atomic clocks and is maintained by the International Bureau of Weights and Measures (BIPM).
- UTC is designed to approximate the mean solar time at 0° longitude (the prime meridian), which is the basis for civil time and time zones.

### **Leap Seconds**

- The Earth's rotation is gradually slowing due to tidal forces from the Moon and Sun, as well as changes in Earth's structure and climate. Consequently, the length of a day based on Earth's rotation increasingly diverges from the day defined by atomic clocks.
- To account for this divergence and keep UTC in sync with the Earth's rotation, leap seconds are added.
- A leap second is a one-second adjustment that is inserted as a "stop" second into UTC to keep it aligned with the Earth's rotation. It is added on either June 30th or December 31st, as required.

## Sun Halo

A rare celestial event, “**double sun halo**“, was recently observed in the skies over **Ladakh**.

**Sun halos** are common in parts of India, but a double halo is rare, especially in regions like Ladakh.

*A sun halo, also called a '22-degree halo,' is an **optical phenomenon** caused by sunlight refracting through millions of **hexagonal ice crystals** suspended in the atmosphere.*

### Double Sun Halo

- A **double sun halo** is a variation of the more common **22-degree halo**, where two concentric rings of light appear around the **sun**.
- In a double sun halo, **two halos** are visible – an **inner halo** with a radius of approximately 22 degrees and an **outer halo** with a radius of around **46 degrees** from the sun's centre.
- It is a rare optical phenomenon caused by the **refraction** of sunlight through **ice crystals** in **cirrus clouds**.
- These **hexagonal** ice crystals act as **natural prisms**, refracting and reflecting the sunlight at **specific angles**. The precise alignment of the ice crystals, with their **flat faces** parallel to the ground, is rare, making the double sun halo an uncommon sight.

### Significance

- Astronomers and atmospheric scientists study halos to understand:

- Atmospheric conditions (temperature, humidity, and ice crystal distribution)
- **Properties of ice crystals** causing the refraction
- Improve **weather forecasting** models
- Enhance understanding of **atmospheric optics** (light scattering and refraction phenomena)
- Rare celestial events like this can attract **tourists** and nature enthusiasts, especially in places like Ladakh.

### **Ancient Greek sanctuary slowly sinks into the Aegean Sea.**

Recently, Scientists warned that due to climate change-induced rising sea levels, Delos, a small island in the Aegean Sea near bustling Mykonos, could disappear within the next 50 years.

#### Impact of Rising Sea Level on Delos Island

- Studies suggest that higher temperatures and humidity can change the chemical makeup of materials found in cultural heritage monuments.
- This risk is amplified by evident structural deterioration caused by seawater erosion, notably impacting structures such as trade and storage buildings dating back to the first and second centuries BCE.

Delos Island:



- Delos, situated in the **Aegean Sea** as part of the **Cyclades archipelago**, is a rocky island. It was initially inhabited in the 3rd millennium B.C. and gained prominence in the 1st millennium B.C.
- Today, Delos remains mostly uninhabited, featuring rugged granite terrain that spans approximately 1.3 square miles.
- **History:** Delos was revered as a holy sanctuary for a thousand years before being recognised as the birthplace of **Apollo and Artemis in Olympian Greek mythology**. The island's **Sacred Harbour** includes three conical mounds linked to a goddess, **Athena**.
- UNESCO designated **Delos as a World Heritage Site** for its outstanding archaeological remains, significant influence on Greek architecture, and its sacred importance in Ancient Greece.
- **Archaeological Importance:** Extensive excavations have unearthed artefacts now exhibited at the Archaeological Museum of Delos and the National Archaeological Museum of Athens.
- The island has been inhabited since the third millennium BCE and functioned as a significant cult center for deities such as Dionysus and Leto.
- Delos underwent purification rituals to ensure the proper veneration of gods, which included relocating graves that were visible from the temple.



Aegean Sea:

- Delos is situated in the Eastern Mediterranean Basin, bordered by the **Greek peninsula to the west** and **Anatolia (the Asian side of Turkey) to the east**.
- Straits: The **Bosphorus** and **Dardanelles Straits** connect the Aegean Sea to the Black Sea and the Marmara Sea.
- Ownership of Aegean Islands: Most of the Aegean Islands are part of Greece. Turkey's notable possessions in the Aegean Sea include **Imbros**

**(Gökçeada)** and **Tenedos (Bozcaada)**, located in the northeastern part of the sea.

- Climate: It features a **Mediterranean climate** similar to that of **Western Turkey** and **Greece**. The climate is classified as **Hot-summer Mediterranean, with dry and hot summers and wetter, milder winters**. Summers in the region are cooler compared to arid and semi-arid climates.
- The northern part of the Aegean Sea experiences a cold, semi-arid climate characterized by cooler summers.
- The weather in the Aegean basin is predominantly influenced by the Etesian wind.

**New research found that Australia's enigmatic pink sand- Garnet was born in Antarctic mountains.**

Garnet:

- It is rare in beach sand which is destroyed by prolonged exposure to the waves and currents of the ocean.
- It is a fairly common mineral, deep red in color. It crystallizes at high temperatures, usually where **large mountain belts grind upwards** out of colliding tectonic plates.
- These are opaque, transparent to translucent minerals that can be found as individual crystals, pebbles, or clumps of inter-grown crystals.
- There are six main types of garnet, all with slightly different chemical compositions. All kinds of garnet can form in the same place and

sometimes garnets can be a combination of types e.g. **pyrope-almadine** or **pyrope-spessartine**.

Formation:

- These are formed in **metamorphic** (schist, amphibolite, and eclogite) and **igneous** (some granites and peridotite) rocks.
- This mineral grows deep in Earth's crust, in the same kind of conditions in which diamonds are formed.
- When sand contains an abundance of garnets, it usually contains **epidote and magnetite** as well.
- **Australia** produces almost **half of the world's garnets**, with the rest mainly coming from India, USA, and China.
- **Uses:** It is used for manufacturing blasting media, abrasives, grinding wheels, mosaic cutting stones, decorative wall plasters, ceramics, polishing of picture tubes, glass polishing and antiskid surface for roads, air strips etc.

### **Barda Wildlife Sanctuary (BWS)**

The Forest Department in Gujarat has initiated the translocation of spotted deer and sambars from Gir Forest to Barda Wildlife Sanctuary (BWS), approximately 100 kilometers away.

- As lions make Barda sanctuary their second home
- **Objective:** This effort aims to enhance the prey population for **Asiatic lions** in BWS.

- This month, forest officials captured 23 spotted deer from Gir using the **Boma technique** and transported them to Barda Wildlife Sanctuary (BWS) in Porbandar.

**Boma Technique:** This method involves herding animals into an enclosure using funnel-like fencing.

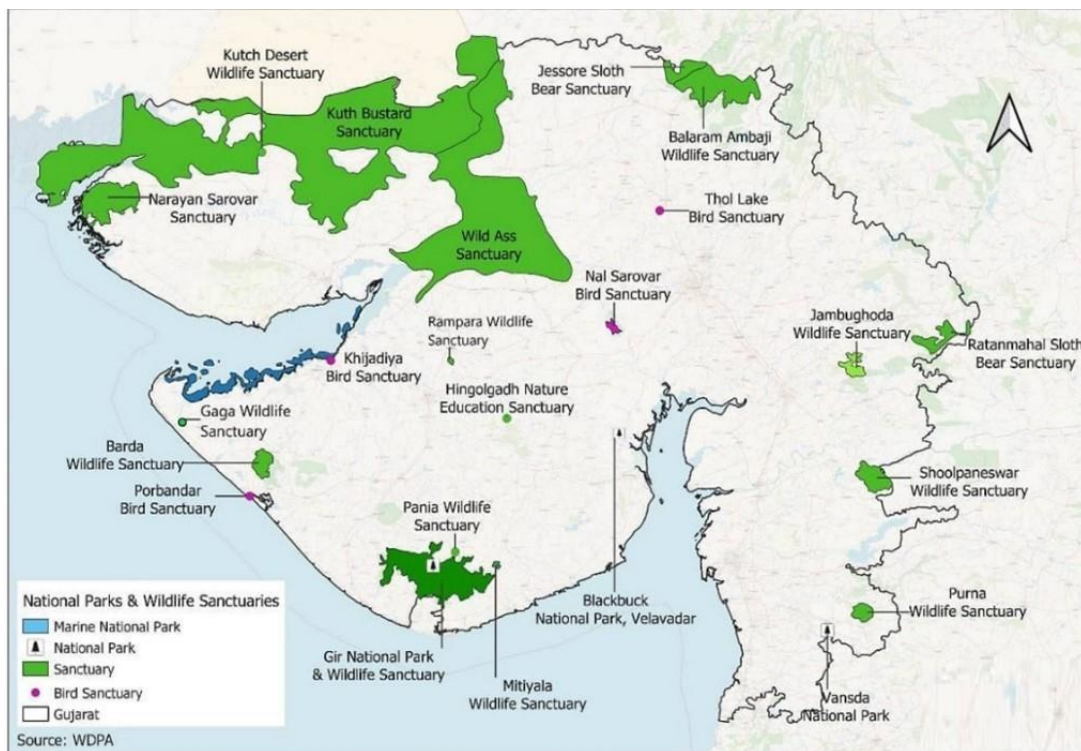
Reasons for Translocation-

- **Supporting Lion Reintroduction:** Lions return to Barda after a long absence, but the area lacks enough prey to sustain them.
- Translocating deer and sambars will provide a food source for these lions.
- **Restoring the Ecosystem:** Barda historically had lions, and reintroducing prey species helps restore the natural balance.
- **Managing Gir Forest Population:** Gir has a large spotted deer population (over 90,000).
- Translocating a small number helps manage Gir's population while boosting Barda's.

Barda Wildlife Sanctuary (BWS)

- **Location:** Gujarat, India.
- **Proximity:** About 15 kilometres from Porbandar and 100 kilometers west of Gir Forest National Park.
- **Landscape:** Hilly terrain covering 192.31 square kilometers.
- **Rivers:** Includes the **Bileshvary River** and the **Joghri River**.
- **Dams:** Two dams, **Khambala and Fodara, are contained.**

- **Ethnic Communities:** Inhabited by ethnic groups such as **Maldharis, Bharvads, Rabaris, and Gadhvis.**
- **Development Project:** The '**Gir-Barda Project**' was initiated by the State Government in 1979 to establish Barda as a secondary habitat for the Asiatic lion.



Flora & Fauna

- **Notable Plants:** This sanctuary includes plants such as Rayan, Babul, Ber, Jamun, Amli, Gorad, Bamboo, Dhav, Dhudhlo, and others.
- **Mammals:** Leopard, **hyena**, wild boar, wolf, jackal, blue bull.
- **Birds:** Rare and endangered species like the spotted eagle and crested hawk eagle.

- Scientific Name: **Panthera leo persica**
- These are smaller than African lions.
- **Breeding Season of Lions:** Lions do not adhere to a particular breeding season, typically producing cubs approximately every two years.
- Gestation lasts an average of three to four months, with litter sizes typically ranging from one to four cubs.
- **Reproductive Features:** Lions are sexually mature by 2 years old, but males may not have the opportunity to mate until they are closer to 5 years old. They are polygamous, with the dominant male of the pride breeding with multiple females in the group.

#### Conservation Efforts

- **Asiatic Lion Conservation Project:** Initiated by the Union Ministry of Environment, Forests, and Climate Change (MoEFCC).
- **Duration:** Approved for three financial years from 2018 to 2021.
- **Objectives:** Focuses on scientific management, community involvement, and coordination with multiple agencies for disease control and veterinary care to ensure the overall conservation of Asiatic lions.
- **Habitat:** West Bengal in the east to Rewa in Madhya Pradesh, central India.
- **Current Habitat:** Now restricted to Gir National Park and Wildlife Sanctuary.
- **Distinct Feature:** Notable for a longitudinal fold of skin along its belly.

### **Protection Status**

- IUCN Red List: Classified as 'Endangered'.
- CITES: Listed in 'Appendix I'.
- Wildlife (Protection) Act 1972: Included in 'Schedule I'.

### **Threats**

- Vulnerability: Susceptible to unpredictable events like plagues or natural disasters.
- Human Conflict: Poaching and retaliatory killings by locals near Gir National Park due to livestock attacks.

### **Ganga Water Sharing Treaty**

The Indian Prime Minister announced that India and Bangladesh will begin technical-level talks for the **renewal of the 1996 Ganga water treaty**.

An Indian technical team will visit Bangladesh soon for the conservation and management of the Teesta river.

*There are criticisms that:*

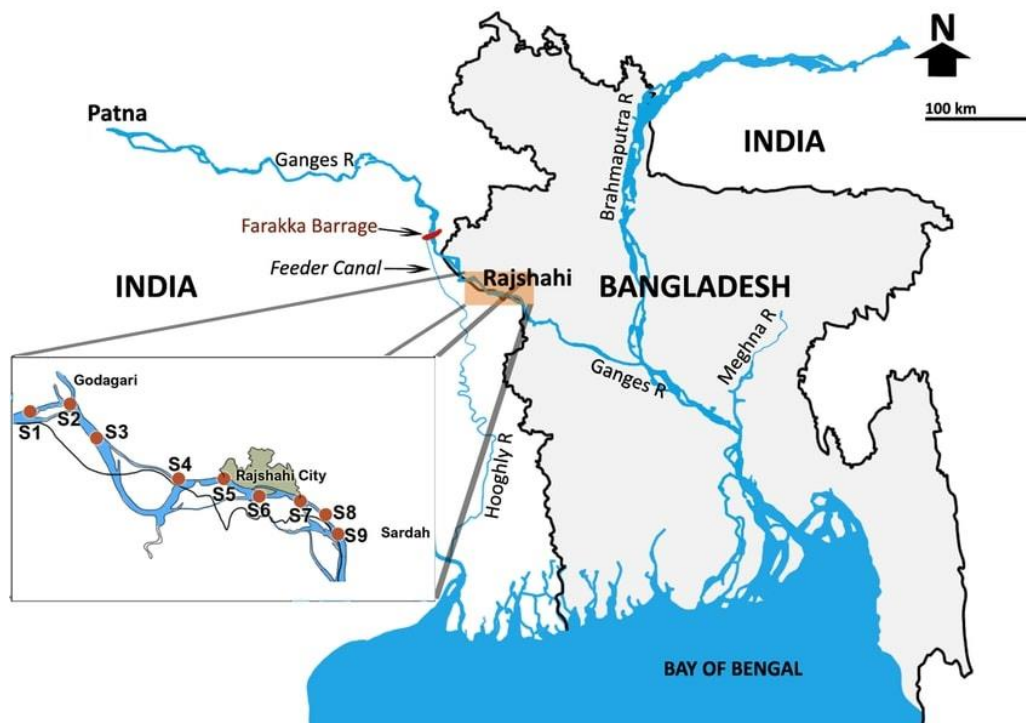
- **West Bengal not consulted:** However, there are criticisms that West Bengal, a party to the treaty, was not consulted and dues from the previous treaty remain unpaid.



- **Dredging of Ganga has been stopped:** Additionally, the stoppage of Ganga dredging is claimed to be causing floods and erosion, alleged to be part of a plan to sell off Bengal.
- **Ganga Water Sharing Treaty**

*Background of the treaty:*

- India and Bangladesh share **54 trans-boundary rivers** that drain through Bangladesh of which the Ganges is highly seasonal.
- In 1975 India constructed a Barrage across the **Ganges at Farakka:**
- For diverting the flow of water to the Hooghly River and
- To ensure the flushing of the Calcutta Port thus, affecting Bangladesh's share of the Ganges waters.



About the treaty:

• **Ganga Water Sharing Formula:**

- If availability at Farakka is less than 70,000 cusecs: 50:50 split (35,000 cusecs each).
- If availability is between 70,000 and 75,000 cusecs: Bangladesh receives 35,000 cusecs, India gets the rest.
- If availability is 75,000 cusecs or more: India receives 75,000 cusecs, Bangladesh gets the rest.

- **Critical Month (April):** Bangladesh is **guaranteed a flow of 35,000 cusecs** in the first and last ten days of April.
- **Emergency Adjustments:** If flow falls below 50,000 cusecs in any ten-day period, the two governments will consult for emergency adjustments.
- **Monitoring:** A Joint Committee monitors daily flows at the feeder canal in Farakka and the navigation lock at **Hardinge Bridge** (the point within Bangladesh where flows are monitored), submitting annual reports to both governments

**Concerns**

- Consultation Concerns: There have been criticisms, particularly from West Bengal, about the lack of consultation in treaty renewals and unmet obligations from previous agreements.
- Floods, Erosion and Siltation: West Bengal and Bihar have raised several concerns about the treaty including erosion, siltation and floods due to the Farakka barrage across river Ganga as it does not allow river sediments to flow with minimal obstruction.

- Increasing Salinity and Desertification: Alarming increases in deforestation and erosion in the upper Ganges have caused significant silt deposition downstream. Combined with increased salinity, this has led to desertification in the region.
- Impact on Sundarbans: The Sundarbans, the **world's largest mangrove forest** and a **UNESCO World Heritage site**, faces devastating impacts from the Farakka Barrage. Formed by Himalayan sediment from the Ganges, the forest now suffers as water withdrawal at Farakka during the dry season reduces sediment-laden freshwater discharge, threatening its ecosystem.
- Distribution of Water: Bangladesh remains concerned about the effectiveness and equitable distribution of water from the Farakka Barrage. Example-The average flow at Farakka between 1949 and 1988 was used to formulate the key traits of the 1996 treaty, where the inevitable issue of climate change was overlooked.



- **River Ganga**

- *Transboundary River:* Ganga river is a **trans-boundary river of Asia** which flows through India and Bangladesh.
- *Originates in:* It rises in the **Gangotri glacier near Gaumukh**, situated at an elevation of 3,900 metres in the **Uttarkashi district** of Uttarakhand.
- *Geographical Extent of the Ganga river system:* The river has a **length of 2,525 km**. It is shared by Uttarakhand (110 km) and Uttar Pradesh (1,450 km), Bihar (445 km) and West Bengal (520 km).
- *Renamed as Padma:* The Ganges enters Bangladesh, where it is renamed the **Padma**.
- It is joined by the **Jamuna** (the lower stream of the Brahmaputra) and eventually by the **Meghna**.
- This forms the major estuary of the Ganges Delta, emptying into the Bay of Bengal.

**Conclusion**

- There is a need to include all vested parties in ongoing dialogue and technical reviews. This will ensure the treaty's objectives are met and the benefits of this vital resource are preserved for future generations.

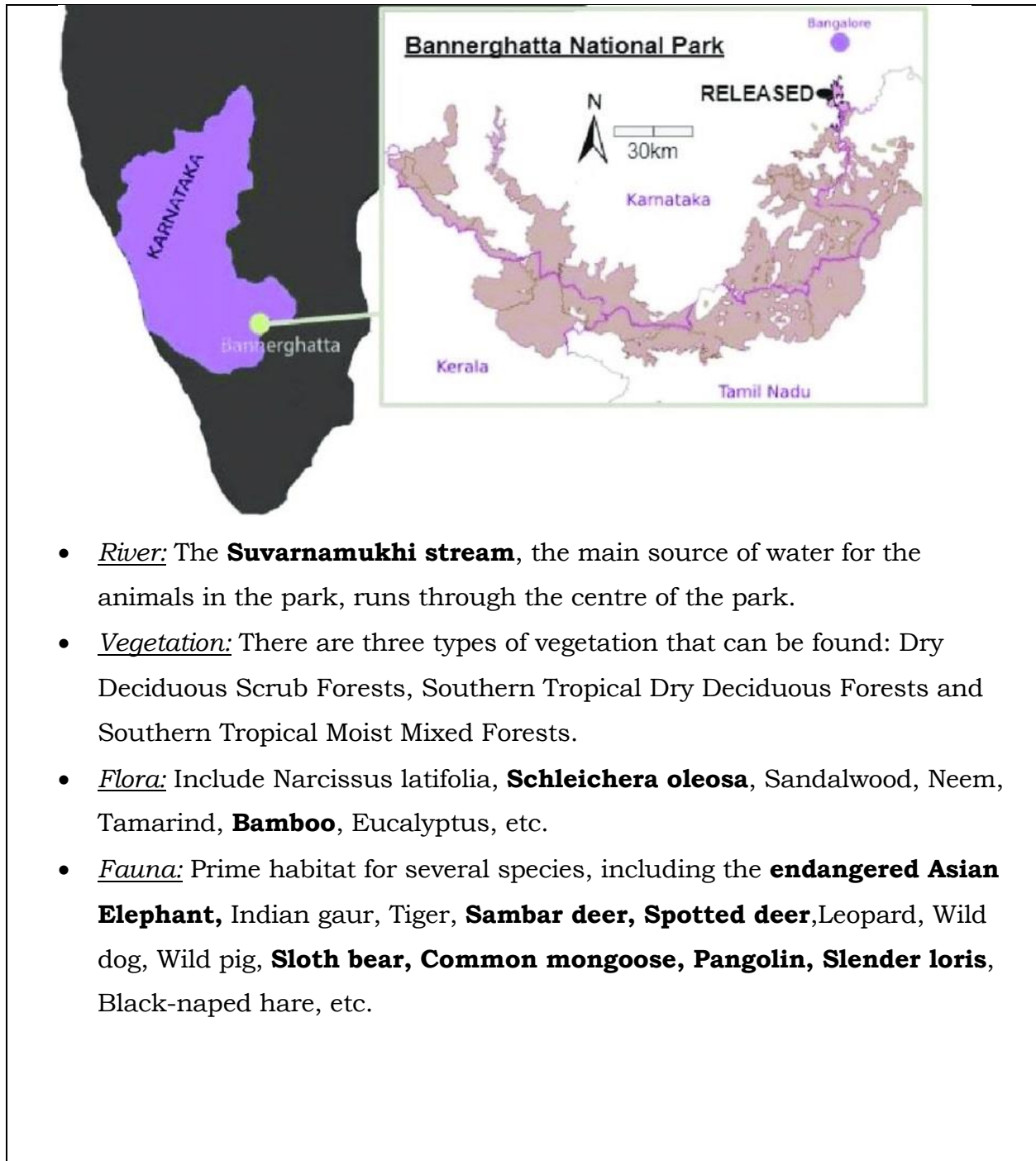
**South India's first and the country's largest leopard safari was recently inaugurated at the Bannerghatta Biological Park (BBP).**

**Bannerghatta Biological Park (BBP):**

- It has been an integral part of **Bannerghatta National Park** and emerged out as an **independent establishment in 2002**.
- It is in order to meet the growing demand for eco-recreation, eco-tourism, and conservation, an area of 545.00ha of forest from the National Park was set aside to constitute a biological park originally and later extended to 731.88ha.
- It is located about 22kms south of Bengaluru city, Karnataka.
- It has different units such as Zoo, Safari, Butterfly Park, and Rescue Centre (Conservation of Captive animals).
- It is *the first biological park in India to have a fenced, forested elephant sanctuary*.

Facts about Bannerghatta National Park

- Location: It is located near Bangalore, Karnataka, in the hills of the **Anekal range**.
- It was declared a **National Park in 1974**.
- In 2006, **India's first butterfly enclosure** was inaugurated at the park.



## SCIENCE AND TECHNOLOGY

**The government of Jammu and Kashmir recently declared human rabies a notifiable disease under the Epidemic Diseases Act of 1897.**

### Rabies:

- Rabies is a **vaccine-preventable, zoonotic, viral disease** caused by the **RABV virus**.
- It primarily affects the central nervous system, leading to severe brain disease and death if medical care is not received before symptoms start.

### Transmission:

- In up to 99% of cases, domestic dogs are responsible for rabies virus transmission to humans. Yet, rabies can affect both domestic and wild animals.
- It spreads to people and animals **via saliva**, usually through bites, scratches, or direct contact with the mucosa (e.g., eyes, mouth, or open wounds).
- Rabies is present on all continents except Antarctica, with over **95% of human deaths occurring in Asia and Africa**.
- It is one of the **neglected tropical diseases (NTD)** that predominantly affects already marginalized, poor, and vulnerable populations.

### Symptoms:

- The symptoms may be nonspecific at first but include lethargy, fever, vomiting, and anorexia.

- Within days, signs can progress to cerebral dysfunction, ataxia, weakness and paralysis, breathing and swallowing difficulties, excessive salivation, abnormal behaviour, aggressivity, and self-mutilation.
- Once clinical symptoms appear, rabies is **virtually 100% fatal**.

Prevention:

- It is a vaccine-preventable disease.
- Vaccinating dogs, including puppies, is the most cost-effective strategy for preventing rabies in people because it stops the transmission at its source.
- Treatment:
- Medical care following a rabies exposure is called **post-exposure prophylaxis**, or PEP.
- PEP includes wound care, a dose of **human rabies immune globulin (HRIG)**, and a series of **four or five rabies vaccines**, which must be administered as soon as possible after exposure.
- This care is vital to prevent the disease from developing. It is nearly 100% effective if administered promptly.

**Scientists at the Institute of Advanced Virology (IAV), Thiruvananthapuram, recently developed a novel way of generating non-infectious Nipah virus-like particles (VLPs) in the laboratory.**

Virus-like Particles (VLPs):

- VLPs are molecules that **resemble viruses** but lack infectivity because of the absence of viral genetic material.



- They are a very effective way of creating vaccines against diseases such as human papillomavirus (HPV), hepatitis B, malaria, and more.
- As they are very similar to real viral molecules, introducing a VLP into the body will **trigger an immune response**, but a person will not experience any symptoms of the virus they are being vaccinated against.
- Once the body has had an immune response to the VLP, it will recognize the virus and prevent infection in the future, giving people immunity to that particular virus.

Structure:

- VLPs are very small, with a particle radius of approximately **20 to 200 nm**. This means that they can easily enter the **lymph nodes**, where the immune system is activated in the case of an infection.
- A VLP consists of one or more structural proteins that can be arranged in multiple layers.
- They can also contain an **outer lipid envelope**, which is the outermost layer that covers a large number of different viruses. This outer layer protects the genetic material inside the virus particle.
- Creating a VLP vaccine can use bacterial, yeast, insect, or mammalian cells.
- When used as a vaccine, VLPs cause a robust immunogenic response due to their **high-density display of epitopes** and the capacity to present multiple proteins to the immune system.

- Most recently, VLPs have been employed as **nanomachines** to deliver pharmaceutically active products to specific sites and into specific cells in the body.

Nipah Virus:

- Nipah virus (NiV) is a **zoonotic virus** (it is transmitted from animals to humans) and can also be transmitted through contaminated food or directly between people.
- In infected people, it causes a range of illnesses, from asymptomatic (subclinical) infection to acute respiratory illness and fatal encephalitis.
- The virus can also cause severe disease in animals, such as pigs, resulting in significant economic losses for farmers.
- It first broke out in Malaysia and Singapore in 1998 and 1999.

Treatment:

- There are currently no drugs or vaccines specific for Nipah virus infection.
- Intensive supportive care is recommended to treat severe respiratory and neurologic complications.

**Recently, ICAR has commercialised herbicide-tolerant (Ht) basmati rice varieties that can control weeds.**

Direct Seeded Rice (DSR):

- It is a modern rice cultivation technique where **rice seeds are directly sown** into the field, replacing the traditional method of **transplanting seedlings** from a nursery.

- It is an efficient, and sustainable method of rice cultivation that offers significant benefits for farmers, the environment, and the economy.

Herbicide-Tolerant Basmati Rice:

- ICAR commercialised **non-genetically modified (non-GM) Ht basmati rice**. These varieties allow direct application of the herbicide **Imazethapyr** due to a mutated **ALS gene**.
- **Scientific debate:** Research indicates that hand weeding at specific intervals (20 and 40 days after sowing) in DSR is more effective and yield-enhancing than the use of Imazethapyr.
- ICAR's research **favours eco-friendly hand weeding** over repeated herbicide applications for weed control and higher seed yield.
- Weed diversity and risks: Imazethapyr targets specific **broadleaf weeds (BLW)**, not all weed types.
- Herbicide-resistant weeds may evolve, threatening rice production and food security.
- Similar challenges were seen with Bt-Cotton and **pink bollworm resistance**.
- **Historical context:** In the North Western Plains (e.g., Punjab, Haryana), DSR has been long used for growing Basmati rice.
- Green Revolution promoted water-intensive transplanted rice, causing ecological issues.
- Innovations in DSR: From 2014 to 2017, innovations in DSR at IARI Karnal led to the adoption of **TAR-VATTAR technology**, which uses climatic

factors and effective herbicides like **Pendimethalin** to reduce costs and save water.

- **Recent adoption and impact:** During COVID-19, the labour shortage saw a spike in DSR adoption in Punjab, proving its viability.
- The Haryana government conserved water (e.g., 31,500 crore litres saved in 2022) by adopting DSR on a large scale.

**Recent research has discovered a novel protein, referred to as "Neo," which plays a critical role in bacterial defence mechanisms against viral infections, particularly bacteriophages.**

Neo:

- **Discovery of "Neo":** It was reported by researchers led by Stephen Tang and Samuel Sternberg in a 2023 preprint paper on bioRxiv while working on **Klebsiella pneumoniae**.
- **Mechanism:** Bacteria defend themselves from viral infection (against bacteriophages) using diverse immune systems, many of which sense and target foreign nucleic acids. **Defense-associated reverse transcriptase (DRT) systems** are one of them.
- In the **DRT-2** system, the bacteria undergo **de novo gene synthesis** via rolling-circle reverse transcription (RT) of a **non-coding RNA (ncRNA)**.
- In uninfected bacterial cells, the ncRNA and RT enzyme lead to the synthesis of a **repetitive single-stranded cDNA**.
- The presence of **phage triggers** the second-strand cDNA synthesis, leading to the production of long double-stranded DNA.

- This **double-strand cDNA generates messenger RNAs** that encode a stop codon-less, **never-ending open-reading frame (neo)** whose **translation (neo protein)** causes potent growth arrest (cell dormancy) of bacteria. It protects the larger bacterial population from the spread of phage.

Significance in Biotechnology and Medicine:

- It represents a potential biotechnological tool for controlling viral infections.
- **Retroelements** in the human genome and bacterial reverse transcriptases have a common evolutionary history as well as share functional mechanisms.
- Bacterial reverse transcriptases, believed to be the precursors of their eukaryotic counterparts, exhibit analogous mechanisms.

Reverse transcriptase:

- The ability of cells to create **DNA copies from RNA** is called **reverse transcription**. It is performed by the enzyme called reverse **transcriptase**.
- Reverse transcriptase, discovered by Howard Temin and David Baltimore in 1970, has revolutionised research methods in molecular biology and is crucial in studying and managing RNA viruses like HIV.
- Reverse transcriptase is used in molecular biology to clone genes, perform **PCR**, and analyse genomes.
- It is also used in diagnostics to detect and quantify viral loads, such as in the case of SARS-2. It also has helped track the virus's spread, paving the way for surveillance, better public healthcare, and vaccine development.

**Research on the Cassini spacecraft did not find a galactic anomaly of the kind predicted in the MOND theory.**

MOND theory:

- **Propounded by:** Israeli Physicist **Mordehai Milgrom** initiated a new research program in cosmology, called MOND (for **MODified Newtonian Dynamics**) or **Milgromian dynamics**, in 1983.
- **Basic Idea:** Milgrom proposed a set of postulates in three papers describing how Newton's laws of gravity and motion should be changed in regimes of very low acceleration.
- Milgrom's postulates were designed to explain **the asymptotic flatness of galaxy rotation curves** without the necessity of postulating the existence of "dark matter"
- **Aims:** MOND seeks to replace **Newtonian dynamics** and general relativity to account for the ubiquitous mass discrepancies in the Universe without invoking the dark matter, an inherent part of the Newtonian Theory of Standard Dynamics.

Limitations of the MOND theory:

- **The Cassini Mission:** Due to a quirk of MOND, the gravity from the rest of our galaxy should have caused Saturn's orbit to deviate from the Newtonian expectation subtly, But Cassini did not find any anomaly of the kind expected in MOND.
- The timing of radio pulses between Earth and Cassini was tested, which allowed for the precise tracking of Saturn's orbit.

- **Finding:** The study found out that no matter how the calculations are tweaked, given how MOND would have to work to fit with models for galaxy rotation, it cannot fit the Cassini radio tracking results.
- **A test provided by wide binary stars:** MOND predicted that Two stars that orbit a shared centre several thousand AU apart should orbit around each other **20% faster than expected with Newton's laws.**
- But a detailed study rules out this prediction, with the chance of the MOND theory prevailing being the same as a fair coin landing heads up 190 times in a row.
- Failure to explain small bodies in the distant outer Solar System: Comets coming in from there have a much narrower energy distribution than Mond predicts.
- These bodies also have orbits that are usually only slightly inclined to the plane that all the planets orbit close to. Mond would cause the inclinations to be much larger.
- MOND theory also fails on scales larger than galaxies and is unable to explain the motions within galaxy clusters.
- **Gravity Anomaly:** MOND cannot provide enough gravity either, at least in the central regions of galaxy clusters. However, on their outskirts, MOND provides too much gravity.

Significance:

- **Dynamics of individual galaxies:** MOND predicts quite accurately the observed dynamics of individual galaxies of all types (from dwarf to giant

spirals, ellipticals, dwarf spheroidals, etc.), and of galaxy groups, based only on the distribution of visible matter (and no dark matter).

- **General Laws of galactic dynamics:** MOND's basic tenets predicted the general laws of galactic dynamics (with some additional, plausible, non-MOND-specific requirements) are well obeyed by the data, with  $a_0$  appearing in these laws in different, independent roles.
- MOND has unearthed a number of unsuspected laws of galactic dynamics, predicting them a priori, and leading to their subsequent tests and verification with data of ever increasing quality.
- One of these phenomenological laws is the **baryonic Tully-Fisher relation**, which is underlain by the MOND **mass-asymptotic-speed relation (MASR)**
- **New Tools:** MOND, as a set of new laws, affords new tools for astronomical measurements, such as of masses and distances of far away objects in ways not afforded by standard dynamics.

Cassini Spacecraft:

- **Project Agency:** The Cassini probe is a joint endeavour of NASA, the European Space Agency, or **ESA**, and the **Italian Space Agency**.
- **Launch year:** Cassini was launched in **1997** along with ESA's **Huygens probe**.
- **Type:** Orbiter, Flyby Spacecraft
- **Path:** The spacecraft studied Jupiter for six months in 2000 before reaching its destination, Saturn, in 2004 and starting a string of flybys of Saturn's moons.



- **Huygens probe:** The Huygens probe on **Saturn's moon Titan** in 2004 to study the moon's atmosphere and surface composition.
- **Aim:** It was a keystone for the exploration of the Saturnian system and the properties of gaseous planets in our solar system.
- **Cassini Solstice Mission:** It is the second extended mission. Cassini made the first observations of a complete seasonal period for Saturn and its moons, flew between the rings and descended into the planet's atmosphere in 2017.

### **The use of Meropenem drug can cause adverse reactions as per The Indian Pharmacopoeia Commission (IPC).**

IPC Warns of Severe Reactions to Meropenem Drug, Calls for Regulation of Antibiotics

- The **Indian Pharmacopoeia Commission (IPC)** has found that using **Meropenem** can lead to adverse reactions in patients in the form of **Acute Generalized Exanthematous Pustulosis (AGEP)**, a severe drug related reaction, and can be life threatening. It is advised that doctors and patients exercise caution while using the drug.
- The IPC's drug safety alert analyzed adverse drug reactions from **Pharmacovigilance Programme of India (PvPI)** database revealing that Meropenem drug causes adverse drug reaction.
- **Regulation of Antibiotics: Drugs Controller General of India** has directed states/UT governments to keep a close watch on the sale of inappropriate antibiotic combinations which should be banned immediately.

- **Prevention:** It has further instructed the officials to prevent the spread of these cocktail drugs into the market.
- The regulator has sought a detailed report of licensed antibiotics available for sale from the drug controllers in the state.

Meropenem Drug:

- Meropenem Drug is a **carbapenem antibiotic** manufactured by Pfizer and is available under various brand names in India. Pfizer's meropenem drug formulation already contains a safety alert for **acute generalized exanthematous pustulosis (AGEP)** on its pack.
- **Mechanism of Action:** Meropenem penetrates bacterial cells and interferes with the synthesis of vital cell wall components, which leads to cell death.
- **Schedule H:** The medicine falls under the schedule H and H1 of the drugs and cosmetic rules, 1945 and required to be sold by retail only under the prescription by a doctor.
- **Prescribed for Infections:** The medication is largely prescribed for the treatment of pneumonia, UTI, intra-abdominal infection, skin infection, meningitis, septicaemia and gynecological infections etc.

Indian Pharmacopoeia Commission (IPC):

- **Nodal Ministry:** It is an Autonomous institution fully financed by the Central Government under the administrative control of the Ministry of Health and Family Welfare.
- **Established:** The Commission has become fully operational from 1st January, 2009

- **Chairman:** The Secretary of the Ministry of Health and Family Welfare.
- **Mandate:** It is to perform functions such as revision and publication of the Indian Pharmacopoeia and National formulary of India on a regular basis besides providing IP Reference Substances and training to the stakeholders on Pharmacopoeial issues.

Functions:

- Timely publication of the **Indian Pharmacopoeia**, the official book of standards for drug included therein, in terms of the Second Schedule to the Drugs and Cosmetics Act, 1940
- To specify the standards of identity, purity and strength of the drugs imported, manufactured for sale, stocked or exhibited for sale or distributed in India.
- **Pharmacovigilance Programme of India:** It is Government of India's drug safety monitoring programme, which collects, collates and analyses drug-related adverse events and send recommendations to **Central Drugs Standard Control Organization (CDSCO)** for taking appropriate regulatory actions.

Acute Generalized Exanthematous Pustulosis:

- **AGEP** is an uncommon **pustular** drug eruption characterized by superficial pustules and is usually classified as a **severe cutaneous adverse reaction (SCAR)** to a prescribed drug. It is also called toxic **pustuloderma**.
- **Incidence Rate:** It is estimated to be about 3–5 cases per million population per year.

- **Causes:** Close to 90% of cases of AGEP are a result of adverse reactions to a medication, most often **beta-lactam antibiotics** (e.g., penicillins, cephalosporins).
- **Other drugs:** tetracyclines, sulfonamides, quinolones, oral antifungals, particularly terbinafine, calcium channel blockers such as diltiazem, **hydroxychloroquine**, carbamazepine, and paracetamol.
- AGEP is associated with **IL36RN gene mutations**.

#### Schedule-H drugs

- These medicines contain a very high **alcoholic influence** and are used to treat some serious diseases like heart diseases, anxiety disorders and other diseases.
- **Legal Provision:** Schedule-H drug is a class of prescription drugs in India mentioned in Schedule-H to the **Drugs and Cosmetics Rules, 1945** as framed under the **Drugs and Cosmetics Act, 1940**.
- **Prescription sale:** Schedule H warrants retail sale of the medicine only against a valid prescription by a **Registered Medical Practitioner** only.
- Schedule H list at present contains **510 drugs**.
- **Schedule H1:** It was introduced in **2013** in the Drugs and Cosmetics Act 1940 as a new class of prescription drugs containing certain **3rd and 4th generation antibiotics, certain habit forming drugs and anti-TB drugs**.

**A team of scientists in the UK recently developed non-invasive measurement techniques and novel analysis methods to decode Huntington's disease.**

A team of scientists in the UK recently developed non-invasive measurement techniques and novel analysis methods to decode disease progression and evaluate the effect of potential treatments or lifestyle changes in people with **Huntington's disease**.

Huntington's Disease:

- HD is an **inherited disorder** that causes **nerve cells (neurons)** in parts of the brain to gradually break down and die.
- It has a wide impact on a person's functional abilities and usually results in movement, thinking (cognitive), and psychiatric disorders.
- There are two types of HD:
- Adult-onset is the most common. Persons with this form usually develop symptoms in their mid-30s or 40s.
- Early-onset affects a small number of people and begins in childhood or in the teens.
- **Cause:** A genetic change (mutation) in the **HTT gene** causes HD.
- The HTT gene makes a protein called **huntingtin**. This protein helps your nerve cells (neurons) function.
- The *normal HTT gene contains a stretch of DNA* that specifies the number of times the **amino acid glutamine** is repeated in the Htt protein. This number varies from 11 to 31.

- In the mutant versions of the HTT gene, this stretch is expanded to encode 35 or more repeats.
- As the number of repetitions increases, the severity of Huntington's disease increases and its debilitation begins at an earlier age.
- HD is rare. The disease is passed down through families.

**Symptoms:**

- HD usually causes movement, cognitive, and psychiatric disorders with a wide spectrum of signs and symptoms.
- The patient suffers mood swings, has **difficulty in reasoning**, shows abnormal and uncontrollable jerky movements, and experiences difficulty in speaking, swallowing, and walking.

**Treatment:**

- There is no cure for HD. There is no known way to stop the disease from getting worse.
- The goal of treatment is to slow the symptoms and help the person function for as long as possible.

**Enterobacter bugandensis in ISS**

A recent study by IIT Madras and NASA discovered a dangerous bacteria called **Enterobacter bugandensis** on the **International Space Station (ISS)**.

- This bacteria is known for causing **hard-to-treat infections in hospitals**. In the unique conditions of space, like zero gravity and increased radiation, the bacteria changed and became even more difficult to treat with antibiotics.  
*International Space Station (ISS):*
- The International Space Station (ISS), launched on November 20, **1998**, stands as the **largest man-made structure in space**. It functions as a living space for astronauts, a role it has continuously fulfilled since 2011.
- **Objectives:** The ISS aims to advance our understanding of space and microgravity while fostering new scientific investigations.
- Additionally, it serves as a symbol of international collaboration.
- *IIT Madras & NASA Researchers study Multidrug-Resistant Pathogens on the International Space Station*
- **Participating Organizations:** The Indian Institute of Technology Madras (IIT Madras) and NASA's Jet Propulsion Laboratory (JPL) are participating in the project.
- The Jet Propulsion Laboratory (JPL) represents a distinctive partnership between NASA and Caltech.
- **Objective of the Research:** To investigate the behavior, adaptation, and evolution of multi-drug resistant pathogens approximately 400 kilometers above the Earth's surface aboard the **International Space Station (ISS)**.  
*Key features:*
- **Studying Drug-Resistant Pathogens:** Examining genomic adaptations of drug-resistant pathogens can enhance precision in treatment approaches.

- Understanding pathogen persistence in environments such as spacecraft and hospitals can aid in contamination control.
- **Microbial Dynamics:** Combining genomics, metagenomics, and metabolic modeling enables the study of microbial dynamics across diverse extreme environments.
- **Comprehensive study:** Investigating genomic, functional, and metabolic enhancements seen in multidrug-resistant pathogens, with a specific emphasis on **Enterobacter bugandensis**, a common **nosocomial pathogen** discovered on surfaces within the ISS, to gain understanding.

Enterobacter Bugandensis:

- Enterobacter bugandensis is a newly discovered species in the **Enterobacter genus**, identified in 2013 from bloodstream infection cases in Uganda.
- **Morphology:** Enterobacter Bugandensis exhibits a **Gram-negative, rod-shaped** structure.
- **Habitation:** Similar to other species within the Enterobacter genus, E. bugandensis is typically found in various environments, including soil, water, and the gastrointestinal tracts of animals and humans.
- **Pathogenicity:** Enterobacter Bugandensis is capable of causing various infections, particularly in individuals with weakened immune systems.
- These infections may include bloodstream infections, respiratory infections, urinary tract infections, and wound infections.



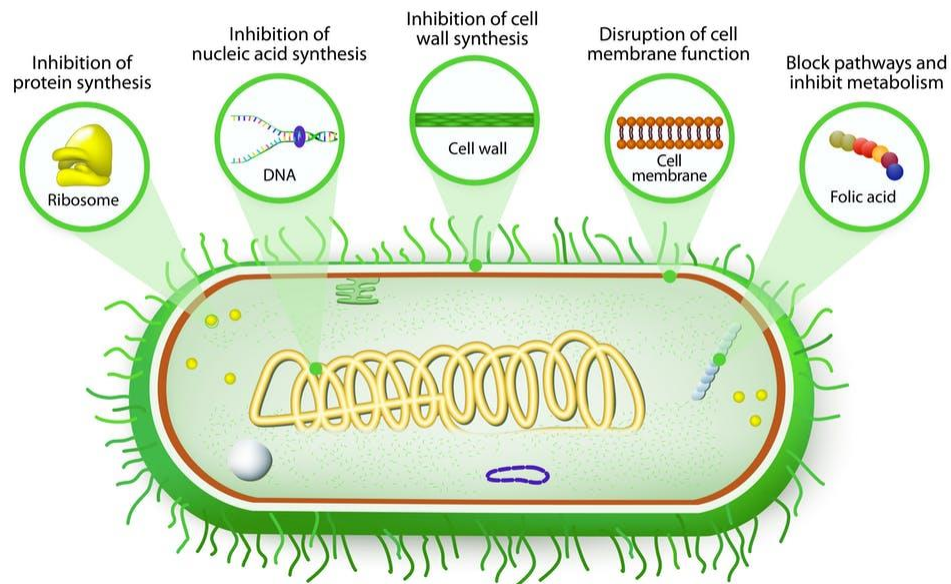
- **Resistance:** Enterobacter Bugandensis has demonstrated resistance to numerous antibiotics, posing challenges in treatment.
- Mechanisms of resistance may involve the production of beta-lactamase, efflux pumps, and mutations that diminish drug uptake.



### **Multidrug-resistant organisms**

- Multidrug-resistant organisms (MDROs) are bacteria that have developed resistance to multiple antibiotics, making them difficult to treat. These bacteria are often called “superbugs” because they can cause infections that are easy to spread and hard to cure.

## MECHANISMS OF ANTIBIOTIC ACTION



- Multidrug-resistant pathogen
- It describes a microorganism that has acquired resistance to multiple antimicrobial agents, usually spanning three or more antimicrobial categories.
- This resistance can manifest in different types of microorganisms, such as bacteria, viruses, and parasites.
- The most significant threat to public health among MDR forms is represented by bacteria that withstand multiple antibiotics.

**Researchers at the Indian Institute of Science (IISc) have developed a new three-step process to remove heavy metal contaminants, such as arsenic, from groundwater.**

IISc researchers collaborate with NGOs, including the **INREM Foundation and Earthwatch**, to test and deploy these systems in rural areas like Bhagalpur in Bihar and Chickballapur in Karnataka.

*IISc new method:*

- The IISc new method is designed to remove heavy contaminants from groundwater.
- It not only removes arsenic but also guarantees safe and sustainable disposal of the contaminants.
- Further, It prevents them from re-entering the groundwater system.
- This comprehensive approach addresses a major gap in existing arsenic removal technologies.

*Three processes are:*

1. **Adsorption:** Separating arsenic from water using a biodegradable absorbent.
2. **Bioremediation:** Reducing pollutant concentration.

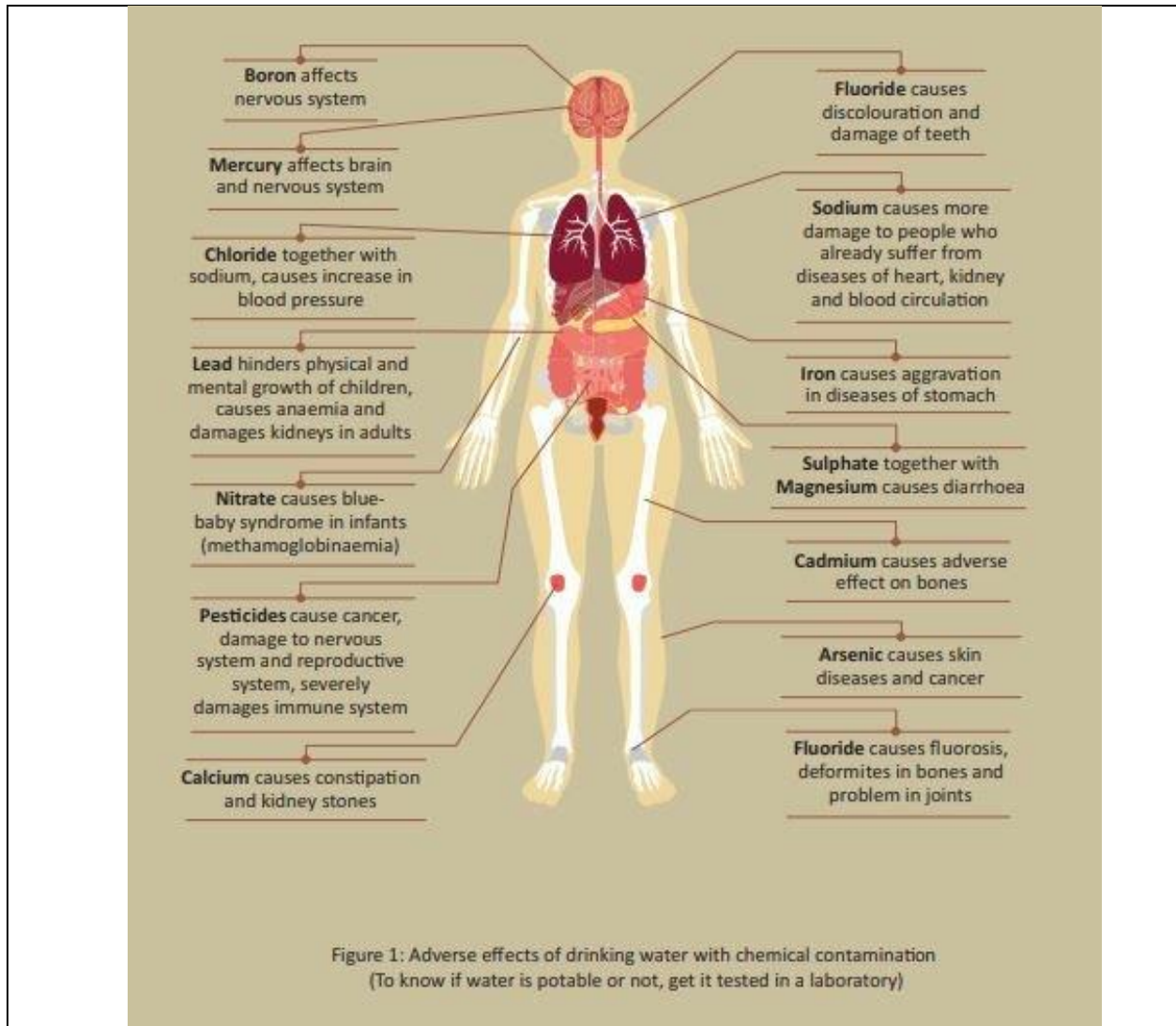
3. **Environmentally Friendly Disposal:** Ensuring safe disposal of removed heavy metals.

Heavy Metals:

- It is defined as the metallic elements with high density compared to water.
- It comprises metalloids like **arsenic**.
- The toxicity due to heavy metal is very challenging as it is soluble in water and easily absorbed by living organisms
- Examples: Iron, copper, tin, and precious metals such as silver, gold, and platinum

Allowable Limits for Arsenic and Fluoride in Water (WHO):

- **Arsenic in Drinking Water-** The safe limit for arsenic in drinking water is **10 parts per billion (ppb)**.
- This guideline helps ensure safe consumption and reduces health risks from long-term exposure.
- **Fluoride in Drinking Water-**The World Health Organization (WHO) recommends a provisional limit of **1.0 milligram per kilogram (mg/kg)** for fluoride in drinking water.
- **Arsenic in Agricultural Water-**For water used in agriculture, the allowable limit for arsenic is **0.10 milligrams per liter (mg/l)**.



Contamination Status in India:

- **Arsenic levels:** Reports indicate 113 districts in 21 Indian states have arsenic levels above 0.01 mg per liter.

- Fluoride levels: Additionally, 223 districts in 23 states have fluoride levels exceeding 1.5 mg per liter.
- These levels are above the permissible limits set by the Bureau of Indian Standards and the World Health Organization (WHO), posing health risks.

**The FDA unanimously gave backing to Eli Lilly's Alzheimer's drug, Donanemab.**

The FDA confirmed that the drug has potential benefits for early-stage patients that outweigh the risks

Alzheimer's Disease (AD):

- It is a **neurodegenerative disease** that usually starts slowly and progressively worsens. It is a major cause of **Dementia** in patients.
- **Symptoms:** Memory loss, problems with language, disorientation etc.
- **Duration:** Long term.
- **Prevalence:** An estimated 5.3 million people are currently living with dementia in India.
- Alzheimer's is one of the most common forms of dementia. This prevalence is likely to increase to 14 million by 2050.
- **Risk factors:** Genetics, head injuries, clinical depression, hypertension, psychological stress, lack of physical and mental exercise, Abnormal accumulation of amyloid-beta protein and tau protein inside neurons is also linked to the pathology of Alzheimer's disease.

- **Treatment:** At present, there is **no cure for Alzheimer's disease**. However, it can be managed by medicine and supportive therapies. These can temporarily reduce the symptoms.
- **Amyloid beta protein therapy:** There are three main ways to target amyloid  $\beta$ -protein for treating Alzheimer disease: inhibiting its production, preventing its aggregation (or promoting its disaggregation), and promoting its clearance.

Donanemab Drug:

- **Donanemab** is a **monoclonal antibody** designed to remove toxic **beta-amyloid** plaques from the brains of people with early Alzheimer's disease.
- This drug is not the cure for Alzheimer's; however, it is effective in lessening cognitive decline.
- It is the third drug after **Leqembi** and **Biogen** to show that removing amyloid early in the disease can slow neurological degeneration.

Benefits of Donanemab Drug:

- **Slows Cognitive Decline:** The cognitive decline in early Alzheimer's patients is slowed down by 35.1 per cent in 76 weeks.
- **Improves patient's Independence:** It can extend patients' ability to function independently by months and, possibly, years.
- **Continued Benefits Post-Treatment:** The drug's benefits continued even after patients stopped taking the monthly infusions.
- **Monthly Infusion Schedule:** An infusion is required only once a month compared to other drugs.

Side Effects of Donanemab:

- **Safety Profile slightly risky:** This may result in slightly higher adverse events than its predecessor, **Lecanemab**.
- **Risk of ARIA:** Risk of amyloid-related imaging abnormalities (ARIA) such as swelling or bleeding in the brain.
- **Possibility of Treatment-related Deaths:** Three treatment-related deaths were reported in the study.

**Recently, International Fatty Liver Day 2024 was celebrated as in the month of June.**

*International Fatty Liver Day 2024:*

- Theme for International Fatty Liver Day 2024 – **‘Act Now, Screen Today’**.
- This special day highlights a fatty liver disease that impacts about 1 in 4 people worldwide.

*Fatty Liver Disease:*

- Fatty liver disease occurs when fat accumulates in the liver.
- The liver is **the largest organ** inside the body.
- It is closely connected to metabolic health, cardiac health, and cancer risk.
- **Impact of fat:** Excessive fat in the liver can lead to inflammation, causing damage and scarring.
- In severe situations, this scarring can result in liver failure.

*Incidence of Fatty Liver Disease in India:*

- According to an AIIMS study, In India, Around **38% of Indians** have fatty liver or non-alcoholic fatty liver disease.



- In another AIIMS study, there were reports of 67 per cent deaths among patients with antituberculosis drug-related acute liver failure.
- This disease is affecting nearly 35 per cent of the children too.
- **Reclassification:** The condition is now known as '**Metabolic dysfunction-associated steatotic liver disease**' (MASLD).
- **Global Prevalence:** This disease affects 25-30% of the global population.
- MASLD is closely linked to obesity, diabetes, high blood pressure, and abnormal cholesterol levels.
- **India's Statistics:** In 2022, a study showed that 38.6% of Indian adults and 36% of obese children had fatty liver.
- There are **two types** of this disease.
- **Nonalcoholic Fatty Liver Disease (NAFLD):** It affects individuals who consume little to no alcohol.
- **Alcoholic Fatty Liver Disease (Alcoholic Steatohepatitis):** This disease arises when Fat builds up due to excessive alcohol consumption.
- *Risk Factors for Fatty Liver Disease*
- **Obesity:** Being overweight, especially around the abdomen, raises the risk of fatty liver disease.
- **Type 2 Diabetes and Insulin Resistance:** People with diabetes or pre-diabetes are more prone to developing non-alcoholic fatty liver disease (NAFLD).
- **Insulin Production: Excess glucose leads to high insulin levels, causing insulin resistance.**

- **Fat Storage:** Insulin resistance promotes the storage of fatty acids in the liver, leading to fatty liver disease.
- *High Blood Cholesterol and Triglycerides*
- **Blood Lipids:** Elevated cholesterol and triglyceride levels can lead to fatty liver.
- **Genetic Factors:** Some individuals may have a genetic tendency to develop fatty liver.
- **Disease Progression:** Over time, fatty liver can develop into steatohepatitis and cirrhosis, which may require a liver transplant.

### Longitude Prize on Antimicrobial Resistance (AMR)

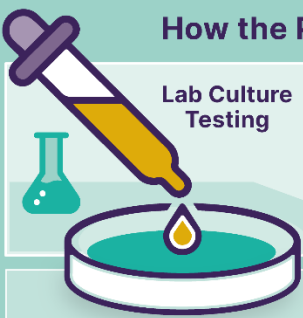
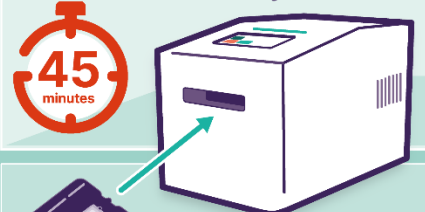

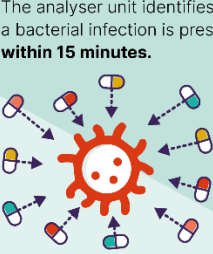
Recently, **PA-100 AST System**(a high-tech, transformative, rapid, point-of-care test for **Urinary Tract Infections**) has won the **Longitude Prize on Antimicrobial Resistance (AMR)**.

#### **PA-100 Antimicrobial Susceptibility Testing (AST) System**

- It is an **automated analyser** that combines phase contrast **microscopy and nanofluidics** to make available antibiograms, for the **first time, at the point of care**.
- It relies on **nanofluidics to perform rapid AST**, and uses the most advanced phenotypic diagnostic performance possible.
- Cell growth is monitored in real time using **contrast phase microscopy**.
  - Resistant bacteria keep a higher growth rate during incubation, while susceptible ones grow slowly or lyse.
- It provides **targeted antibiotic treatment in less than one hour**, reducing the risk of AMR.

- It has been evaluated with the **most common uropathogenic bacterial species** in uncomplicated UTI:
  - **Gram negative:** Escherichia coli, Klebsiella pneumonia, Proteus mirabilis;
  - **Gram positive:** Staphylococcus saprophyticus, Enterococcus faecalis;

### How the PA-100 AST System compares

Lab Culture Testing	PA-100 AST System
 <p><b>2 to 5 days</b></p>	 <p><b>45 minutes</b></p>
<p>A urine sample is taken by a health worker or medic and sent to a lab - perhaps in a hospital - to be analysed.</p> <p>This process can take <b>two or three days</b>, but sometimes as many as five. <b>This is too long</b> for most health workers, medics and patients to wait for treatment.</p> <p>This testing method can result in <b>unnecessary antibiotic prescriptions</b> based on symptoms rather than on a test result.</p>	<p>A sample of urine is taken by a health worker or medic and added to a special cartridge. The cartridge is inserted into an analyser unit small enough for a doctor's office.</p> <p>The analyser unit identifies whether a bacterial infection is present <b>within 15 minutes</b>.</p> <p>It exposes the bacteria to tiny quantities of antibiotics to see which are <b>effective at killing the infection</b>.</p> <p>Within 30-45 minutes it tells the health worker or medic <b>the right antibiotic to prescribe</b>.</p>
	

### Urinary Tract Infections (UTI)

- These are one of the most common **bacterial infections** and also one of the driving **causes of antibiotic prescription worldwide**.
- Bacteria in the urine are trapped in **over 10,000 microfluidic traps in**

**parallel arrays** and exposed to five different antibiotics at five different concentrations.

– **Five commonly prescribed antibiotics** for the treatment of uncomplicated UTI are tested: ***amoxicillin/clavulanic acid, ciprofloxacin, fosfomycin, nitrofurantoin and trimethoprim.***

– Due to the limited availability of point-of-care diagnostics, empiric treatment is standard in many settings.

a. Due to the high incidence of the disease, empiric UTI treatment fuels antimicrobial resistance (AMR).

#### **Do You Know?**

– **Antibiotic-resistant** infections killed nearly **1.3 million people globally in 2019** and are on course to cause **10 million deaths a year by 2050, outstripping deaths caused by cancer.**

– The **global economy** may **lose up to 4 trillions by 2030** and up to **100 trillions by 2050** due to the AMR crisis.

#### **Truenat Platform**

Recently, the **Truenat platform** has been hailed for its role in **combating TB** at the 77th **World Health Assembly in Geneva**, a **decision-making body of WHO.**

- It was developed by **Goa-based Molbio Diagnostics**, is a ground-breaking innovation in the **field of molecular diagnostics.**

- Truenat is a **real-time quantitative micro-PCR system**.
- It is a **portable, battery-operated machine** that can be deployed at labs, health centres, and even in the field that can **test for over 40 diseases**, including Covid-19, HCV, HBV, HIV, HPV, dengue, malaria, influenza, herpes, typhoid, and TB.

### **Game-Changer in TB Diagnostics**

- The platform provides a rapid molecular test for the **diagnosis of pulmonary, extrapulmonary, and rifampicin-resistant tuberculosis**. The **Global Fund**, which collaborates with the WHO to build stronger health systems across the globe, appreciated India's commitment to eliminating TB by creating mass awareness, and intensive monitoring programmes using digital technologies.

### **Tuberculosis in India**

– According to the **India TB report 2024**, the incidence rate in India had **fallen** from 237 per lakh population in 2015 to 199 per lakh population in 2022, while the mortality rate had declined from 28 per lakh population in 2015 to 23 per lakh population in 2022.

a. India's efforts to ensure early tuberculosis detection and treatment initiation, along with a host of community engagement efforts has resulted in **a decline of 16% in TB incidence** (new cases emerging each year) and **a 18% reduction in mortality due to TB**, since 2015.

### Initiatives

- National Strategic Plan (2017-2025);
- National TB Elimination Program (NTEP);
- National Institute of Tuberculosis and Respiratory Diseases (NITRD);
- Drug Sensitive-TB Treatment as per National Tuberculosis Elimination Program (NTEP);
- Ni-kshay Portal;

### Streptococcal Toxic Shock Syndrome (STSS)

Japan is facing a significant health crisis due to the spread of Streptococcal Toxic Shock Syndrome (STSS).

- STSS is a severe infection caused by Group A Streptococcus (GAS) bacteria. STSS is capable of killing within just 48 hours of infection.
- STSS is a severe illness caused by group **A Streptococcus bacteria**, triggers an intense inflammatory response that can damage multiple organs.
- Early symptoms like fever, muscle pain, and nausea can quickly escalate to organ failure if not promptly treated.
- Timely medical intervention with antibiotics, fluids, and sometimes surgery is crucial to save lives and prevent serious complications.
- Cases of a rare but lethal human flesh-eating bacterial infection have gripped Japan.

- Data from the National Institute of Infectious Diseases reveals that Japan has already recorded nearly 1,000 cases this year alone, surpassing last year's numbers.
- **Group A streptococci (GAS)** are **ubiquitous bacteria** that can potentially cause various human infections. They are classified as **gram-positive cocci** that cause a range of diseases.
- After the easing of COVID-19 restrictions, there has been a general rise in GAS infections. It is particularly affecting people over 50, who are more vulnerable to severe outcomes.
- Group A Streptococcus bacteria produce toxins that trigger a hyper-inflammatory response in the body.
- These toxins lead to widespread tissue damage and severe inflammation, resulting in rapid tissue necrosis (flesh-eating), extreme pain, and shock.
- The bacteria can swiftly enter the bloodstream and organs, causing multi-organ failure in a short period.

### Application of AlphaFold 3 in life sciences

The 3D structure of a **protein-RNA** ion was predicted by AlphaFold 3.

- **Protein-folding problem:** The **folding process** followed by a **protein** to go from its straight form to its final form remains **unanswered**.

- Knowing the evolution of protein shape is important for understanding the workings of cells & organisms.
- AlphaFold uses **machine learning** and **artificial intelligence (AI)** to predict protein structures from an amino acid sequence accurately.
- AlphaFold 3 uses a **diffusion model**, which is also used by image-generating software. The model works by first **training on protein structures**, adding noise to the data, and then trying to de-noise it.
- This way, the model becomes able to work its way back from a noisy structure to a real protein structure.
- AlphaFold 3 can predict **protein-protein interactions**, the structures of other molecules like DNA and RNA, and proteins' interactions with all these other compounds.
- It can potentially be used to find **drug candidates** that can bind to proteins and help **cure diseases**.

### **Nuclear study provides major update on plutonium isotope fission**

A recent US study on **Prompt Fission Neutron Spectrum (PFNS)** is significant for updating the design of India's second stage of its nuclear power program.

#### **Prompt Fission Neutron Spectrum (PFNS)**

- Prompt Fission Neutron Spectrum (PFNS) refers to **neutrons emitted immediately** after a **Pu-240 nucleus captures a neutron** but before it stabilises.



- Past Studies: Until now, only one study has examined **PFNS for Pu-240**-induced fission at 0.85 mega-electron-volt (MeV). Recently, U.S. researchers conducted a second study using neutrons with energy levels higher than 0.85 MeV.
- Latest Findings: The study revealed significant discrepancies between predicted and measured PFNS, providing valuable insights for reactor designers and nuclear medicine practitioners.

### Isotopes

- Isotopes are atoms of the same element that have the same number of protons (i.e., atomic number, "Z") but a different number of neutrons, meaning that their mass number, "A", varies.
- Take hydrogen, for example. It has three naturally occurring isotopes—1H, 2H, and 3H.

### Experimental Findings

- Research: Scientists at **Los Alamos Neutron Science Center (LANSCE)** conducted experiments by exposing a pure Pu-240 sample to neutrons ranging in energy from 0.01 to 800 MeV.
- Detection: The setup employed liquid scintillators to detect emitted particles, utilizing a small Pu-240 sample to minimize alpha particle emissions.
- Focus of Measurement: The researchers focused on measuring the energies of neutrons and other fission products, particularly emphasizing neutron-induced fission data.

### Plutonium-240 and its Fission

- Capturing of Neutrons: When a Pu-239 nucleus captures a neutron, it can **either undergo fission or transform into Pu-240**. Pu-240 is commonly found in nuclear reactors and **nuclear weapon test fallout**.
- Behaviour of Pu-240: When Pu-240 captures a neutron, it usually becomes **Pu-241**. **If Pu-240 undergoes fission, the energy of its fission products is uncertain**.
- Current models rely on complex calculations to estimate this energy output.
- Plutonium Production: Plutonium is produced from **Uranium-238** in nuclear reactors. **Plutonium-239 is a weapon-grade fissile material** used in nuclear weapons. Both Pu-239 and Pu-240 are by-products of nuclear reactor operations and nuclear bomb detonations.
- **Relevance of PFNS Study to India's Prototype Fast Breeder Reactor**
- PFBR Use: The PFBR utilises plutonium from **CANDU reactor spent fuel**, which contains Pu-240. Reprocessed spent fuel from the PFBR will also contain Pu-240.
- Importance: Understanding Pu-240 behaviour is crucial for enhancing reactor efficiency and safety.
- **Characteristics of Pu-240**
- Formation of Pu-239: Pu-239 is formed when **U-238 absorbs neutrons in a reactor**. As Pu-239 captures more neutrons, it transforms into Pu-240, accumulating gradually over time.
- Instant Fission: Pu-240 spontaneously undergoes fission, emitting alpha particles. It is classified as a contaminant in weapons-grade plutonium, where its concentration is typically kept below 7%.

- Reactor-Grade: Plutonium containing more than **19% Pu-240** is categorized as reactor-grade.

### Three Stage Nuclear Programme of India

#### Stage I: Pressurized Heavy Water Reactors (PHWRs)

- Pressurized heavy water reactors (PHWRs) are used in the first phase of India's three-stage nuclear power development.
- These reactors create **plutonium-239** as a byproduct in addition to power.

#### Stage II: Fast Breeder Reactor (FBR)

- Fast breeder reactors (FBRs) are used in the second phase of India's three-stage nuclear power development.
- *Composition and Type of Fuel:*
- **Type of Fuel:** FBRs use a **mixed oxide (MOX) fuel** composed of plutonium-239 recovered from spent fuel from the first stage and **natural uranium**.
- **Fission Process:** In order to produce energy in FBRs, **plutonium-239 undergoes fission**.
- **Breeding Fuel:** FBRs are able to **"breed" more fuel than they consume** because *uranium-238 in the mixed oxide fuel transmutates to more plutonium-239*.

#### Stage III: Thorium Based Reactors

- In the third stage of India's three-phase nuclear power programme, **self-sustaining reactors** powered by **uranium-233 and thorium-232** will be deployed.
- Features of Reactors
- **Refueling:** Reactors classified as **thermal breeder reactors** are able to be refuelled with naturally occurring thorium following the initial fuel charge.

**Fuel Composition:** The main fuel used in the reactor is **thorium-232**, which is converted to uranium-233 to provide energy.

#### **Fission and Fusion:**

- **Nuclear Fission:** Nuclear fission occurs when a neutron collides with a large atom, causing it to become excited and split into two smaller atoms, known as fission products. This process triggers a chain reaction as additional neutrons are released.
- Moreover, the splitting of an atom releases a substantial amount of energy.
- Uranium and Plutonium are preferred as fission fuels in nuclear reactors **due to their ease of initiation and control**. In these reactors, the energy released from fission heats water into steam.
- The steam then drives a turbine, generating carbon-free electricity.
- **Fusion:** Nuclear fusion occurs when **two atoms collide to create a heavier atom**, such as when two hydrogen atoms fuse to form helium. This process mirrors the sun's energy production, generating vast amounts of energy—significantly **more than fission**.

**The Indian Army has recently launched a skin bank facility.**

**Indian Army's Skin Bank:**

- It was launched to **help treat severe skin burn injuries** and other skin-related conditions for service personnel and their families.
- The first-of-its-kind facility established in the **Armed Forces Medical Services** is staffed with trained medical professionals, including plastic surgeons, tissue engineers, and specialised technicians.
- It will serve as a centralised hub for the collection, processing, storage, and distribution of skin grafts, providing a "critical resource" for military medical centres across the country.

*What is a Skin Bank?*

- A skin bank is a facility where skin is taken from an eligible donor, and processed, and stored under appropriate temperature for up to five years.
- Skin from a deceased person can be donated **within six hours after death**.
- Anyone can donate skin, irrespective of sex and blood group. The donor's minimum age should be 18 years.
- The skin of persons suffering from AIDS, Hepatitis B & C, Sexually Transmitted Diseases, Skin Cancer, Active skin Disease and Septicemia are considered unfit for donation.
- This donated skin is then collected and processed over five to six weeks and frozen until it's needed.

- The skin is generally preserved in **85% glycerol solution**. It is stored between 4-5 degrees Celsius for up to 5 years.
- When a burn victim requires skin for their injuries, a surgical procedure called **skin grafting** is conducted.

*What is Skin Grafting?*

- It is a simple process when a piece of healthy skin is transplanted to a different area of the body where the skin is damaged or missing.
- There are two main types of skin grafts: **autograft** (skin is taken from another part of the patient's own body) and **allograft (skin is taken from a donor, often sourced from a skin bank)**.
- Any skin can be used on anybody, and within two to three weeks post-grafting, the doctors can determine whether the patient is accepting it or not.

**Multi-Omics is an emerging technology in the field of clinical science in India.**

### **Multi-Omics**

- Multi-omics (multiple omics) is a new approach in biological sciences where the data sets of different omic groups are combined to power discovery across multiple levels of biology.
- By combining data researchers can achieve a more comprehensive understanding of molecular changes contributing to normal development, cellular response, and disease.

**Omic Groups:**

- Genomics: It focuses on the structure, function, evolution, mapping, and editing of information coded within an **organism's DNA**.
- Transcriptomics: Study the complete set of RNA transcripts produced by the genome.
- Proteomics: Evaluate protein expression for a better understanding of cellular function and prediction of therapeutic responses.
- Epigenomics: Examine **heritable changes in gene expression** activity caused by **factors other than DNA changes**.
- Metabolomics: Metabolome comprises all the metabolites present in a cell, tissue, or organism, including small molecules, carbohydrates, peptides, lipids, nucleosides, and catabolic products.
- Microbiomics: It consists of all the microorganisms of a community. Microbes have been found in human skin, mucosal surfaces, and gut.
- The microbiome is analyzed by sequencing the 16S rRNA genes or metagenomics quantification.
- Omics datasets: They are libraries characterizing a specific biological feature, such as the genes, lipids, proteins, metabolites, or microbes of an organelle, cell, tissue, or organism.
- Individual analysis of an omics dataset can identify links between the characterized feature and a specific biological phenomena.
- Multi Omics Strategy: **Multiomics** is the integrated analysis of multiple omics datasets through which one can identify mechanisms of action,

biomarkers, networks, pathways, and other relationships present in physiological and pathological processes.

- The field encompasses all the omics fields and aims to understand the native and altered state of an organism by the analysis of the data from different omics experiments.
- Purpose: Multi Omics approach is critical to find strategies to characterize, monitor, predict and find treatment to many diseases

- **India's approach to Multi Omics**

- India is creating **disease-specific datasets** with many disease specific consortia emerging around the country creating datasets to address individual health problems, ranging from tuberculosis to cancers, rare genetic disorders in children, and even antimicrobial resistance.

**The Indian Gene Map:**

- The Genome India project: The project is a national initiative which aims to develop a reference genome for Indian people, which will help design genome-wide and **disease-specific 'genetic chips'** for low-cost diagnostics and research.
- The Department of Biotechnology had completed sequencing 10,000 genomes from 99 ethnic groups.
- Mission IndiGen: The Council for Scientific and Industrial Research (CSIR) had sequenced the entire genomes of 1,008 individuals in India representing diverse ethnic groups.
- The Mission aims to create a pilot dataset with which researchers could analyse the epidemiology of genetic diseases and help develop affordable



screening approaches, optimise treatment, and minimise adverse events for them.

- *Role of AI:* More value is being attracted by combining these individual datasets using artificial intelligence and machine learning with other extensive datasets on **proteins (proteomics)**, gene expression in cells (transcriptomics), and epigenomics to develop a 'multi-omics' approach to tackle diseases.
- *Usage:* AI and ML based approaches are used in **in-house bioinformatic** pipelines as well as part of commercial tools for analysis of the sequencing data to identify disease-causing variants
- *Ease of Analyses:* AI and Machine Learning can help predict an individual's risk of developing cancer, develop diagnostic tools to detect some cancers early, classify them, and develop treatment strategies

## SOCIETY

**A recent analysis by The Lancet Public Health reveals that globally, men face a greater disease burden and tend to die prematurely compared to women.**

*Key Highlights of the Lancet Study:*

- **Gender Disparities in Disease Burden:** In 2021, men bore the brunt of 13 out of the top 20 causes of disease burden compared to women, including COVID-19, road injuries, and various cardiovascular, respiratory, and liver diseases.

- These conditions disproportionately led to premature deaths among men.
- **Global Trends in Women's Health:** Conversely, globally, women predominantly encountered non-life-threatening conditions such as **musculoskeletal issues, mental health disorders, and headache disorders.**
- **COVID-19 Impact:** In 2021, COVID-19 emerged as the primary cause of health loss globally, with males experiencing a 45% higher health loss from the virus compared to females.
- **Gender Disparity in Ischaemic Heart Disease:** Ischaemic heart disease ranked second in terms of the absolute difference in health loss between males and females.
- Males suffered a 45% higher health loss from heart disease compared to females.
- **Cause of Premature Male Death:** The research links premature male deaths to cancer, heart disease, and road injuries.
- While common among men, lifestyle-related comorbidities remain significant contributors.
- **Women's Health Challenges:** Women's health issues primarily include low back pain, depression, headaches, anxiety disorders, musculoskeletal conditions, dementia, Alzheimer's disease and HIV/AIDS. These **may not lead to premature death** but keep them sick throughout their lifetime.
- **Example:** In 2021, females had over a third higher DALY rates than males (1,265 vs 787 DALYs per 100,000). In South Asia, this gap widened to over 50% (1,292 vs 598 DALYs per 100,000).

- **Rise of Mental Health cases among Women:** Women worldwide are disproportionately affected by mental health conditions.
- For instance, in 2021, the health loss attributed to depressive disorders was more than a third higher among females than males globally, with rates of 1,019 vs 671 DALYs per 100,000.

Causes of Disease Differences:

- **Gender Differences in Adolescence:** In adolescence, disparities between genders become apparent. This period not only marks the onset of biological distinctions but also sees the influence of gender norms shaping individuals' lives.
- **Bias in Health Care Systems:** There is a bias in health care systems where they will more easily diagnose women with mental disorders.
- At the same time, men are less likely to get help for mental health conditions due to perceptions of masculine norms that work against their seeking or getting help.
- **Inadequate Treatment:** Research indicates that women experiencing pain are frequently disregarded by healthcare providers and receive inadequate treatment when they seek assistance.
- Additionally, a recent study revealed that healthcare professionals, regardless of gender, were less inclined to provide assistance for lower back pain when the patient was female.
- **Triple Burden on Women:** Women starting rehabilitation programs for lower back pain often begin in worse condition than men, possibly due to a

triple burden of work, household maintenance, and caregiving duties, hindering access to appropriate services.

- **Narrow Focus on Women's Health:** There has been a tendency within global health systems to focus on women's reproductive capacity, equating women's health solely with their uterus.

**Recently, CSIR concluded the first phase of its longitudinal health monitoring project, Phenome India, and organised a special event, Phenome India Unboxing 1.0.**

*"Phenome India" Project:*

- Phenome India-CSIR Health Cohort Knowledgebase (**PI-CheCK**) is an initiative by the Council of Scientific and Industrial Research (CSIR), launched on 7th December 2023.
- **Objective:** The project aims to develop India-specific risk prediction models for cardio-metabolic diseases including diabetes, liver diseases, and cardiac diseases.
- This is the first-ever pan-India longitudinal health monitoring study focused on cardio-metabolic diseases.
- **Participants:** Nearly 10,000 participants including CSIR employees, pensioners, and their spouses from across 17 states and 24 cities have contributed to the study.
- The collected data includes clinical questionnaires, lifestyle and dietary habits, anthropometric measurements, imaging/scanning data, and extensive biochemical and molecular data.

- **Importance:** The study is crucial for understanding the risk and incidence of cardio-metabolic disorders in the Indian population which may differ from those in Western populations due to ethnic diversity and varied lifestyle patterns.
- **Precision medicine initiative:** Through this project, CSIR is promoting Predictive, Personalised, **Participatory, and Preventive (P4) healthcare**, tailored specifically to the Indian phenotypic and genetic profiles.

*Council of Scientific and Industrial Research (CSIR):*

- **Established: In September 1942.**
- Headquarters: Located in **New Delhi.**
- Funding: CSIR is funded by the Ministry of Science and Technology.
- **Autonomous body:** It operates as an autonomous body under **the Societies Registration Act, of 1860.**

*Objectives:*

- CSIR is primarily focused on scientific research and development in various fields such as aerospace, biology, chemistry, earth sciences, engineering, and medical sciences.

*Organisational structure:*

- **President:** The Prime Minister of India (Ex-officio)
- **Vice President:** The Union Minister of Science and Technology (Ex-officio)
- *Governing body:*
- **Head:** The Director-General leads the governing body.
- **Other Ex-officio member:** The finance secretary (expenditures).
- **Term duration:** Other members serve terms of three years.

CSIR Advisory Board:

- A **15-member body** comprising prominent experts from various scientific and technological fields.
- The board's role is to provide science and technology insights to the governing body.
- Member terms also span three years.

**Tele MANAS - A (MoU) was signed between the Ministry of Health and Family Welfare (MoHFW) and the Ministry of Defence (MoD).**

A Memorandum of Understanding (MoU) was signed between the Ministry of **Health and Family Welfare (MoHFW)** and the **Ministry of Defence (MoD)** to facilitate collaboration between the two ministries in operating a special cell of **Tele MANAS**.

Tele-MANAS:

- The **Tele Mental Health Assistance and Networking Across States (Tele-MANAS)** initiative was launched by the **Ministry of Health and Family Welfare** in October 2022.
- It aims to provide free tele-mental health services all over the country round the clock, particularly to people in remote or underserved areas.
- Tele-MANAS will be organised in a two-tier system:
- **Tier 1** comprises state Tele-MANAS cells, which include trained counsellors and mental health specialists.

- **Tier 2** will comprise specialists at the **District Mental Health Programme (DMHP)**/Medical College resources for physical consultation and/or **e-Sanjeevani** for audio-visual consultation.
- Currently, there are 51 operational Tele-MANAS cells functioning across all 36 States and UTs, offering services in 20 different languages.
- A toll-free, 24/7 helpline number (14416) is available as part of the initiative, allowing callers to select the language of choice for availing services. The service is also accessible at 1-800-891-4416.
- This call will be an **Interactive Voice Response system (IVRS)** based audio call only, with a timely auto-call back approach.
- Through the automated callback service, the caller will first be attended to by a trained counsellor.
- Based on the level of care required, the counsellor will either provide the care needed within their capabilities or refer the caller for specialist care.
- If the caller requires specialized care, the call will be handled by a mental health specialist (clinical psychologist, psychiatric social worker, psychiatric nurse, or psychiatrist). This level of service will contain both audio- and video-based options.
- In case the caller requires urgent in-person intervention/complex evaluations and management, they will be referred to the nearest in-person service for a physical consultation, and/or an audio-visual consultation with a specialist will be arranged through eSanjeevani.

- These centers will range from Health and Wellness Centre (HWCs) to tertiary care centers as part of the DMHP.

**Recently, UNICEF released “Child Nutrition Report 2024”– titled as “Child Food Poverty: Nutrition deprivation in early childhood”.**

Child Nutrition Report 2024:

- The report examines the status, trends, inequities and drivers of child food poverty in early childhood.
- The report also outlines an agenda for tackling the problem, including actions to transform food systems, leverage health systems, and activate social protection systems in ways that put children’s right to food and nutrition in early childhood at the centre.

Key Findings:

- **High Food Poverty:** Globally, one in four children are living in severe child food poverty in early childhood, amounting to 181 million children under 5 years of age.
- Over two-thirds of the 181 million young children living in severe food poverty live in **South Asia and sub-Saharan Africa**, with 20 countries accounting for 65% of the children living in severe food poverty.
- These countries are Afghanistan, Bangladesh, China, Côte d’Ivoire, the Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, India, Indonesia, Myanmar, Niger, Nigeria, Pakistan, the Philippines, Somalia, South Africa, Uganda, the United Republic of Tanzania, and Yemen.



- **Non-Uniform Progress:** Progress towards ending severe child food poverty is slow, but some regions and countries are proving that progress is possible and is happening.

Major Drivers of Severe Child Food Poverty:

1. Poor food environments for children
  2. Poor feeding practices in early childhood
  3. Household income poverty affecting children and their families
  4. The food, health and social protection systems are failing children's right to good food and nutrition.
- **Conflicts & Shocks:** The global food and nutrition crisis and localized conflicts and climatic shocks are intensifying severe child food poverty, especially in fragile countries.

Child Food Poverty:

- UNICEF has introduced the concept of child food poverty to bring **dietary deprivation** and **poor quality diets** in early childhood to the forefront of global efforts to achieve the nutrition targets of the Sustainable Development Goals.
- UNICEF defines child food poverty as **children's inability to access and consume a nutritious and diverse diet in early childhood (i.e., the first five years of life).**

Child Nutrition Report 2024:

- Recommendations by UNICEF to End Severe Child Poverty

- UNICEF calls on national governments, development and humanitarian partners, donors, civil society and media, academic and research organizations to:

**1. Elevate Child Food Poverty Reduction:**

- To achieve global and national nutrition and development goals and a metric of success in meeting children's right to food and nutrition.
- To commit resources to end child food poverty.

**2. Strengthen Data Systems:**

- To assess the prevalence and severity of child food poverty.
- To detect increases in child food poverty early, including in fragile and humanitarian contexts.
- To track national and global progress in reducing severe child food poverty.
- **Transform Food Systems:** To ensure food environments make nutritious, diverse and healthy foods the most accessible, affordable and desirable option for feeding young children, and the food and beverage industry complies with policies to protect against unhealthy items.
- **Leverage Health Systems:** To deliver essential nutrition services, including counselling and support on child feeding, to prevent and treat child malnutrition, prioritizing the most vulnerable children.
- **Activate Social Protection Systems:** To address income poverty in ways that are responsive to the food and nutrition needs of the most vulnerable children and their families, including social transfers to protect children at highest risk of child food poverty.

*Various Initiatives taken by India:*

1. **Direct Targeted Interventions:** Government implements several schemes and programs like **Anganwadi Services, Scheme for Adolescent Girls** and **Pradhan Mantri Matru Vandana Yojana** under the Umbrella **Integrated Child Development Services Scheme (ICDS)** as direct targeted interventions.
2. **National Nutrition Mission (POSHAN ABHIYAAN):** To prevent and reduce prevalence of stunting, underweight and anemia among children (0-6 years) and reduction in prevalence of low birth weight in the country by involving panchayati raj institutions/village organizations.
3. **Anaemia Mukht Bharat (AMB) Strategy:** It was launched in 2018 with the objective of reducing anaemia prevalence among children, adolescents and women in the reproductive age group.
4. **Poshan Vatikas:** To support development of Poshan Vatikas at Anganwadi centres to meet dietary diversity gap leveraging traditional knowledge in nutritional practices has also been taken up.
5. **Food Fortification:** Encouraging the fortification of staple foods with essential nutrients.
  - Example: In Karnataka, the government mandated the fortification of edible oils, wheat flour, and salt to improve the nutritional status of the population.
6. **Public-Private Partnerships (PPPs):** For example, the Akshaya Patra Foundation partners with the government in various states to provide nutritious mid-day meals to schoolchildren, addressing both hunger and malnutrition.

### **CSIR- ASPIRE Scheme**

300 women Scientists to get research grants for 3 years under CSIR- ASPIRE scheme.

As per the **CSIR-ASPIRE (A Special Call for Research Grants for Women Scientists)** programme women scientists can apply to carry out R&D in life sciences, chemical sciences, physical sciences, engineering sciences, and interdisciplinary sciences.

### **Council of Scientific and Industrial Research(CSIR)**

- **CSIR is a R&D organization** known for its cutting edge R&D knowledge base in diverse S&T areas.
- **It was established** as an autonomous body in **1942** and Headquartered in **New Delhi**.
- CSIR has a dynamic network of **37 national laboratories, 39 outreach centers, 1 Innovation Complexes**, and three units with a pan-India presence.
- **The CSIR laboratories** specialize in topics ranging from the genome to geology, food to fuel, minerals to materials, and so on.

### **GREAT Scheme**

The **Ministry of Textiles** approved grants for seven startups in the technical textiles sector under the **National Technical Textiles Mission (NTTM)**.

- The grants have been approved **under the NTTM's Grant for Research and Entrepreneurship across Aspiring Innovators in Technical Textiles (GREAT) scheme.**
- **Objectives of GREAT Scheme**
- Support young innovators/entrepreneurs in Technical Textiles to **translate prototypes to technologies/products.**
- Support **commercialisation of technologies** developed by innovators/startups in Technical Textiles.
- Bring forward a culture of rapid **translation of ideas/prototypes to products** through collaboration and association of different partners in the country.
- Establishment of **start-ups ecosystem in Technical Textiles.**
- **Funding**
- Under the scheme, the government provides a **maximum** fund support of **INR 50 lakhs per startup** for a period of **18 months.**
- The **Ministry of Textiles additionally provides 10%** of the total grant-in-aid to incubators.
- The **startup** is required to invest **at least 10% of the total sanctioned amount** in two equal instalments.

### Digital Health Incentive Scheme

The Union Government has given a **year-long extension to the Digital Health Incentive Scheme (DHIS).**

### Digital Health Incentive Scheme

- The scheme was launched by the **National Health Authority (NHA)** in **2023** and will now remain in effect till June 30, 2025.
- It was meant for **digitising patients' health records** and linking them with the **Ayushman Bharat Digital Health Account (ABHA ID)**.
- **Aim:** to promote digital health transactions and to provide **boost to the healthcare providers for adopting digital health**.
- Under the scheme, government and private hospitals, clinics, nursing homes, diagnostic labs, and pharmacies are paid Rs 20 for each additional record they digitise, over and above the threshold of 100 transactions a month.
- The scheme is **applicable to both public and private hospitals** and **digital solution companies (DSCs)** creating digital health records.
  - Under it, each facility or digital solution company **can earn incentives up to Rs 4 crores**.

#### **Significance**

- The scheme helps **reimburse hospitals** their expenditure on digitising their facility.
  - This expenditure was often reported as a **significant bottleneck for hospitals to move to digital health**.
- A behaviour change component is also involved in moving from **physical mode of working to digital**.
- DHIS enables better healthcare services and more convenience for patients.

### **ABHA ID**

- It is a unique identity for people that allows **one to store and share their medical records digitally.**
- Once the ID is created – whenever a patient avails a healthcare service at centres linked to the digital framework – all their records are linked to it.
- This ID can then be used to securely store, access, and share the healthcare records, such as doctor's prescriptions, diagnostic test results.

### **Kerala Migration Survey (KMS) 2023 report**

The Kerala Migration Survey (KMS) 2023 report was unveiled at the Lok Kerala Sabha.

- Lok Kerala Sabha is a state government-constituted platform for Keralites abroad and in other states, i.e. non-resident Keralites.
- It is the sixth KMS conducted every five years since 1998. It was prepared by the International Institute of Migration and Development (IIMD) and the Gulati Institute of Finance and Taxation.
- The survey looked at 20,000 households from all 14 districts of Kerala, including rural and urban areas.
- KMS is among the biggest socio-economic surveys ever conducted in Kerala. National Family Health Survey (NFHS-5) sampled only 12,330 households statewide.

### **Key findings**

- Total emigrants increased: The KMS 2023 estimated the number of emigrants from Kerala to be 2.2 million, slightly more than the 2.1 million recorded in 2018.
- Total emigrants returning home increased: The number of emigrants returning home has also increased, from 1.2 million in 2018 to 1.8 million in 2023.
- The decline in emigration to Gulf countries: This is in line with the declining trend seen since 1998 when GCC destinations accounted for 93.8% of Kerala's emigrants.
- Rising emigration beyond the Gulf: Preference for destinations beyond the Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE) has grown from 10.8% in 2018 to 19.5% in 2023.
- Rising student emigration: Students constitute 11.3% of total emigrants from Kerala, with overall numbers almost doubling since 2018 — from 129,763 to 250,000.
- Rise in women emigrants: The number and proportion of women emigrants have increased, from 15.8% in 2018 to 19.1% in 2023, with 71.5% of women being graduates as against 34.7% of men.
  - 40.5% of women emigrants are in Western countries, compared to only 14.6% of male emigrants.
  - Around 51.6% of women emigrants work in the nursing sector.



- Women also make up 45.6% of Kerala's student migrant population.
- Muslim emigrants: Muslims, who make up 26% of Kerala's population (according to the 2011 census), make up 41.9% of the state's emigrants.
- Growing remittances: Rs 216,893 crores in 2023, an increase of 154.9% from Rs 85,092 crores in 2018.
  - It amounts to a per capita remittance of Rs 61,118 for the state's population of 3.55 crores.
  - Average remittance per emigrant household also increased to Rs 2.24 lakh in 2023, compared to Rs 96,185 in 2018.

### **Way forward**

- High student migration suggests an urgent need to enhance the state's educational infrastructure.
- Safe migration pathways for future student emigrants need to be ensured.
- "Brain drain" to "Brain gain": It is also important to develop new policies that will encourage those studying abroad to return home after acquiring valuable skills.
- Skilling: Given that 76.9% of Kerala's emigrants are labour emigrants, it is essential to improve and strengthen their skills to help them secure better employment opportunities and pay abroad..

### Tamil Nadu Seeks GI Tag for Seven Agricultural Products

- The Tamil Nadu State Agricultural Marketing Board has filed applications for Geographical Indication (GI) tags for seven agricultural products from the state.
- The application process was facilitated by the NABARD-Madurai Agribusiness Incubation Forum (MABIF).

#### Products seeking GI Tag

- **Senkanthal Seed:** The seed of the Senkanthal flower (**Gloriosa superba**), the state flower of Tamil Nadu, holds a special place in Tamil literature, art, and culture.
- **Kolli Hills Pepper:** Obtained from the perennial climbing **vine Piper nigrum**, this pepper is known for its quality and is one of the earliest known spices produced in India.
- **Ayyampalayam Nettai Thennai (Coconut):** Renowned for its towering stature, exceptional sweetness, high oil content, and resilience to drought and disease.
- **Tirunelveli Senna Leaf:** A shrubby plant known for its medicinal properties, particularly its use as a laxative and in treating skin diseases.
- **Sathyamangalam Red Banana:** This dwarf banana variety is renowned for its unique flavour, aroma, and colour, which are attributed to the soil and climate of the Sathyamangalam region.

- **Urigam Puli (Tamarind):** It is a large-sized tamarind variety with a distinct sweet-and-sour taste. It is cultivated primarily in the Urigam village of Krishnagiri district in Tamil Nadu.
- **Odaipatti Seedless Grapes:** It is seedless and suitability for both consumption and processing.

### **Pre-Incubation Entrepreneurship (PIE) development programme**

The Indian National Space Promotion and Authorisation Centre (IN-SPACE) has launched the Pre-Incubation Entrepreneurship (PIE) development programme.

- It is designed to boost innovation and entrepreneurship among individuals and early-stage startups.
- Objective: It aims to transform ideas into prototypes, develop entrepreneurial and business skills, catalyse innovation, advance scientific discoveries, and generate socio-economic benefits.
- Eligibility:
  - The applicants must be Indian citizens who are graduates or graduating in 2024 and should not have received any grants, funding, or monetary support from private or government schemes.
  - Start-ups registered with the Department for Promotion of Industry and Internal Trade (DPIIT) on or after July 1, 2022, are categorised as early-stage start-ups, and will be liable to receive the grant.

- Duration: It consists of three phases: Ideate, Innovate, and Demonstrate, spanning 21 months.

### **eMigrate Portal**

- MEA and SBI have signed an MoU to provide an additional digital payment service of the bank through its payment gateway SBIEPay to users of the eMigrate portal.
- The agreement would “further facilitate and enhance the ambit of safe and legal migration of Indian migrant workers.
- The eMigrate Portal was launched in 2014.
- It assists Indian workers (mainly blue-collar workers) going to Emigration Check Countries (ECR) for employment by making the emigration process online and transparent.
- It brings foreign employers, registered recruiting agents and insurance companies issuing the Pravasi Bhartiya Bima yojana on a common platform to facilitate seamless, safe and legal migration.
- It also allows voluntary registration of ECNR (Emigration Check Not Required) passport holders.

### **National Forensic Infrastructure Enhancement Scheme**

Union Cabinet approved the **National Forensic Infrastructure Enhancement Scheme**.

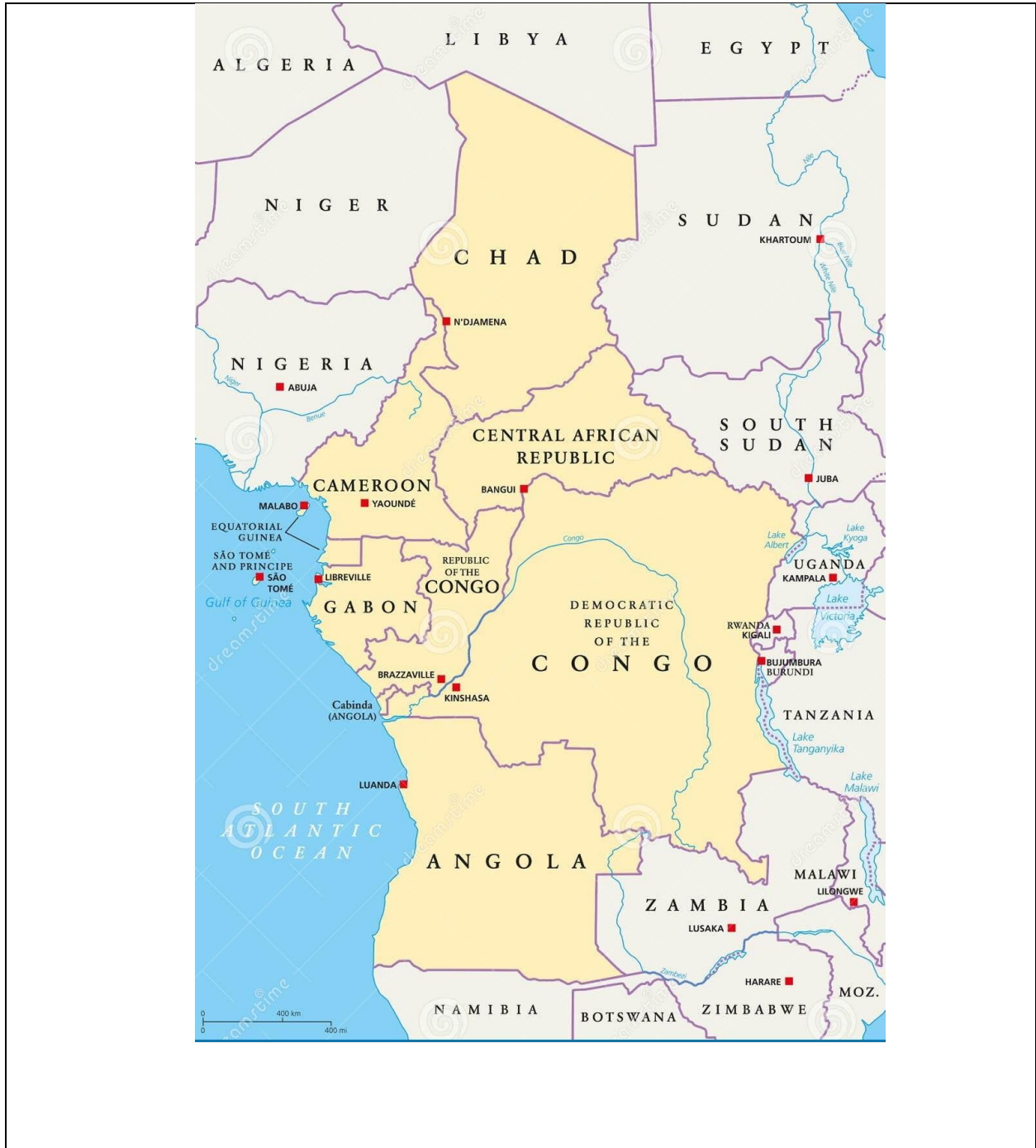
- The National Forensic Infrastructure Enhancement Scheme is a **Central Sector Scheme**.
- **Financial** outlay of the Scheme will be provisioned by the **Ministry of Home Affairs** from its **own budget**.
- **Objective:** To meet the heightened demand for Forensic Science Laboratories (FSL) in the country due to the coming force of the three criminal laws that mandate forensic investigation for offences involving punishment of 7 years or more.
- **Components under the Scheme:**
  1. Establishment of Campuses of the **National Forensic Sciences University (NFSU)** in the country.
  2. Establishment of **Central Forensic Science Laboratories (CFSLs)** in the country.
  3. **Enhancement of existing infrastructure of the Delhi Campus** of the NFSU.
- The scheme underscores the importance of **high-quality, trained forensic professionals** in the timely and scientific examination of evidence for an efficient criminal justice process, leveraging technological advancements and evolving manifestations and methods of crime.
- The establishment of additional off-campus of NFSUs and new CFSLs aligns with the Government of India's goal of securing a high **conviction rate of more than 90%**.

**The World Health Organization (WHO) announced that Chad has successfully eradicated the gambiense form of human African trypanosomiasis (HAT).**

- Chad eliminates **human African trypanosomiasis** as a public health problem
- Chad has become the first country of the year and the 51st worldwide to eliminate a **neglected tropical disease (NTD)**.

Chad

- It is a landlocked country in **north-central Africa**.
- It is largely a semi-desert country.
- **Capital: N'Djamena**
- Bordering Nations: Sudan, Niger, Libya and Central African Republic.
- **Rivers: Chari and Logone**
- Highest point: Mount Koussi
- WHO has validated the elimination of the gambiense form of HAT in seven countries:
  - Togo (2020), Benin (2021), Ivory Coast (2021), Uganda (2022), Equatorial Guinea (2022)
  - Ghana (2023), Chad (2024).
- Progress in the Fight Against NTDs: Chad has joined other countries that have eliminated sleeping sickness, contributing to the global target of eliminating 100 NTDs by 2030.



Human African Trypanosomiasis

- **Human African Trypanosomiasis (HAT)** is commonly known as **sleeping sickness**.
- Disease Causing Agent: Human African trypanosomiasis (HAT) is caused by **protozoan parasites**.
- **Transmission:** Infected **tsetse flies**.
- **Symptoms:** The disease is typically fatal if untreated, causing symptoms like fatigue, headaches, and, in severe cases, coma.

Forms of HAT

- There are two forms of HAT based on the subspecies of the parasite:
  1. **Trypanosoma brucei gambiense:** Accounts for 92% of reported cases.
  2. **Trypanosoma brucei rhodesiense:** Responsible for the remaining 8% of cases.

**Srinagar recognised as 'World Craft City'**

- Recently, Srinagar has earned the **World Craft City (WCC)** tag from the **World Crafts Council (WCC)**.
- **World Craft City:**
- It is a groundbreaking initiative launched in **2014 by the World Crafts Council AISBL (WCC-International)** in recognition of the pivotal role local authorities, craftspeople, and communities play in cultural, economic, and social development worldwide.



- It establishes a dynamic network of craft cities across the globe, aligning with the principles of the creative economy.
- Under the World Craft City Programme, **Jaipur (Rajasthan), Mammalapuram (Tamil Nadu) and Mysore (Karnataka)** have been added as craft cities from India.

*Some of the famous crafts from Srinagar*

1. **Papier-Mache:** It refers to the art of making an object from mashed and molded paper pulp. The object so made is traditionally painted and usually covered with a layer of lacquer or varnish.
2. **Pashmina:** *Shawls, Kani, Sozni:* The Pashmina fabric, hand spun and hand woven, emerged from the picturesque landscape of Kashmir.
3. **Sozni shawls:** Sozni embroidery is one of such arts that have its origin into the geography of Kashmir. The word Sozni is a Persian derived word which means needle and sozankari, the needle work. The person who performs this craft is called the **sozankar**.

#### **Key facts about World Crafts Council**

- It was founded by Ms.Aileen O.Webb, Ms.Margaret M.Patch, and Smt. Kamaladevi Chattopadhyay in 1964, as a **non-governmental and non-profit organization**.
- The main objective of the World Crafts Council is to strengthen the status of crafts in cultural and economic life.

- *Aim:* The Council aims to promote fellowship among crafts persons by offering them encouragement, help, and advice.
- It fosters and assists cultural exchange through conferences, international visits, research study, lectures, workshops, exhibitions, and other activities.

### ART AND CULTURE

Recently, the Prime Minister of India, as part of his meditation exercise, performed 'Surya Arghya' during sunrise at the Vivekananda Rock Memorial.

Vivekananda Rock Memorial:

- The Vivekananda Rock Memorial is situated on a rock in the sea.
- **Location:** Kanyakumari, Tamil Nadu, India
- Architectural style(s): **Indian rock-cut and Cathedral**
- This memorial was built in **1970** to honor Swami Vivekananda.
- The premises also feature a life-sized **bronze statue** of Swami Vivekananda.
- Structures and Features of Vivekananda Rock Memorial
- **Vivekananda Mandapam:** One of the primary structures of the memorial.
- **Shripada Mandapam:** The other main structure of the memorial.

Swami Vivekananda:

- He was Born as **Narendranath Datta** in **1863** into a Bengali family in Calcutta.
- He is considered the "**father of modern Indian nationalism**".

- Famous for: He is known for introducing **Vedanta and Yoga** to the Western world and promoting Hinduism as a major world religion.
  - **Founded:** The Vedanta Society of New York, The Vedanta Society of San Francisco, which laid the foundation for Vedanta Societies in the West.
  - He was the disciple of Ramakrishna, a mystic saint.
  - His birthday (12 January ) is celebrated as **National Youth Day** in India.
  - **Dhyana Mandapam:** A meditation hall attached to the memorial for visitors to meditate,
  - It incorporates architectural styles from various Indian temples.
  - **Surroundings:** The rocks are encircled by the **Laccadive Sea**, where **the Bay of Bengal, the Indian Ocean, and the Arabian Sea converge.**
- Historical and Cultural Significance:*
- Swami Vivekananda: According to legends, Swami Vivekananda swam across the seashore to the rock, where he meditated for three days and nights, attaining enlightenment.
  - This event is linked to his **“Kanyakumari resolve” of 1892.**
  - **Goddess Kanyakumari:** The rock is also associated with the legend of Goddess Kanyakumari (Parvati).
  - It is believed that the goddess Parvati performed tapas (meditation) in devotion to Lord Shiva on this rock.
  - A specific area on the rock is believed to bear the imprint of the goddess's feet.

**Bela block printing, a traditional craft from Bela village in Kutch, Gujarat, is in danger of disappearing.**

*Bela Printing:*

- Bela block printing involves carving intricate designs onto **wooden blocks**, which are then stamped onto fabric to create decorative patterns. Similar to **Bagru print**, Bela print uses a mordant printing method and hand block printing technique.
- **Printing Technique:** This traditional technique uses hand-carved wooden blocks to apply dyes directly onto fabric.
- Bela Print is famous for its bold, graphic designs, typically showcasing vibrant red and black colors, known for their exceptional color fastness.
- **Natural Colors:** The colors used in Bela printing come entirely from natural and vegetable sources.
- **Origins:** Originating in **Kutch Gujarat**, this art form boasts a rich history. For generations, Kachchh has been linked with the creation of Bela-style fabric, showcasing the region's lasting cultural heritage.
- **Practicing Community:** The **Khatri community** is renowned for its mastery of this craft.
- **Distinctive Characteristics:** In contrast to ajrakh, another celebrated block printing method from Kutch recognized for its delicate lines and geometric or floral designs, Bela printing employs broader lines and features motifs such as elephants and horses.
- **Endangered craft:** Bela recently received recognition as an endangered craft from the office of the Development Commissioner for Handicrafts.



Bagru Print:

- **Bagru**, located approximately 30km from Jaipur, is renowned for its handblock printing using natural dyes and traditional techniques.
- This method of hand block printing is said to have originated from **Sant Siromani Shri Namdevji Maharaj**, the revered figure of the **Chippa community**.

Mordant printing method

- Mordant printing, also known as resist printing or block printing, is a traditional textile printing technique that involves the use of mordants to create patterns or designs on fabric.
- It is a method commonly used with natural dyes to enhance color fastness and create intricate and vibrant designs.

Office of the Development Commissioner for Handicrafts:

- The **Development Commissioner for Handicrafts** is a national agency dedicated to the advancement, promotion, and export of Indian handicrafts.
- **Nodal Ministry:** This agency operates under the administrative jurisdiction of the Ministry of Textiles, Government of India.

### **Kheer Bhawani Mela**

- Thousands of Kashmiri Pandits converged at the Kheer Bhawani temple to attend the annual festival of Zeisht Ashtami.
- **Kheer Bhawani temple**
- **It is located** in Tulmulla area of Ganderbal district in **Jammu and Kashmir**, amid chinar trees.
- The temple is constructed above a **sacred spring**, which is said to change its colors.
- Goddess **Ragnya Devi** – an incarnation of Goddess Durga – is the **presiding deity** of this temple.
- **Maharaja Pratap Singh** built this temple in **1912**, which was later renovated by Maharaja Hari Singh.
- **Kheer Bhawani Mela**
- The annual Kheer Bhawani Mela, celebrated on Zeisht Ashtami, is being held at the shrines of **Tulmulla in Ganderbal, Tikker in Kupwara, Laktipora Aishmuqam in Anantnag, Mata Tripursundri Devsar and Mata Kheer Bhawani Manzgamin Kulgam.**

### **Raja Parb celebration**

The President of India attended the Raja Parb celebration at Rashtrapati Bhavan.

- This is the first occasion when the Raja Parb was celebrated at Rashtrapati Bhavan.
- **Raja Parb celebration**
- It is an agriculture-based festival of Odisha and It is one of the most celebrated festivals.
- The three-day-long agricultural festival is celebrated during the onset of monsoons. Women and children celebrate this festival with immense fervour.

#### **Other major festivals of Odisha**

- **Ratha Yatra:** It is an annual chariot festival of Lord Jagannath and his siblings, and is the biggest festival celebrated in the state, in terms of footfalls and following.
- **Baliyatra**– The word Baliyatra literally means voyage to Bali. Each year during Kartik Purnima, people observe the ritual of 'Boita Bandana' by floating paper/cork boats, in ponds, rivers and other water bodies.
- **Dola Purnima**– Popularly known as Holi, the festival is celebrated by every household in the locality, where people greet each other with a splash of colours and sweets.
- **Magha Saptami**–It is also one the biggest festivals of Odisha, after RathaYatra.
- **Chhau Festival** –The festival celebrates the vibrant tribal culture of the state and is a tribute to the contribution of the tribal's in the field of art and craft of Odisha

## Nalanda University

**Nalanda University** was inaugurated in **Rajgir** near the **ancient Nalanda monastery** ruins.

### 'Reviving' Nalanda

- Then President **APJ Abdul Kalam** was the **first** to officially **propose** 'reviving' Nalanda in 2006 as a **Bodhgaya Nalanda Indo-Asian Institute of Learning**.
- It was endorsed at the **2007 East Asia Summit** in Mandaue, the **Philippines**, and re-iterated at the 2009 East Asia Summit in Hua Hin, Thailand.
- The university was established through a **joint effort of 17 countries** other than India: Australia, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, **China**, Indonesia, Laos, Mauritius, Myanmar, **New Zealand**, Portugal, Singapore, South Korea, Sri Lanka, Thailand, and Vietnam.
- **Parliament's Nalanda University Act 2010** accorded it "**national importance**" status and laid down rules regarding its governance.
- It started functioning in **2014** from a makeshift location, and the construction work started in 2017.
- Nobel Prize-winning economist **Amartya Sen** became the University's **first Chancellor**, and then-President **Pranab Mukherjee** became the **first Visitor**.

### Nalanda Mahavira

- **Mahavira**, in **Sanskrit/Pali**, means '**great monastery**'. Nalanda Mahavira was active from the fifth to the thirteenth century CE.



- According to the early 7<sup>th</sup> century Chinese pilgrim **Hiuen Tsang or Xuanzang**, the local tradition explains that the name **Nalanda** came from a **nāga** (serpent deity) whose name was Nalanda.
- Experts also point to the **abundance of nālas (lotus stalks)** in the area and believe that Nalanda would then represent the giver of lotus stalks.
- A seal discovered at the site identifies a monarch named **Shakraditya** as its **founder**, which is the other name for **Kumaragupta I** of the **Gupta dynasty**.
- Post-Gupta period, **Harsha (Siladitya)** of the **Kannauj** and **Pala rulers** were notable patrons.
- **All Buddhist schools**, as well as **other faiths**, were taught in Nalanda.
- Under **Silabhadra**, Nalanda also taught the **Vedas, Hindu philosophy**, logic, grammar and medicine.
- Candidates of other faiths who succeeded in passing a **strict oral examination** were admitted.
- A **strict code of conduct**, including daily meditation and study sessions, was mandatory for students.
- It was **destroyed** in 1193 by Turkish ruler Qutbuddin Aibak's general **Bakhtiyar Khilji**.
- Scottish surveyor **Francis Buchanan-Hamilton rediscovered** it in 1812. In 1861, Sir **Alexander Cunningham** identified it as an ancient university.
- It was recognised as a **UNESCO World Heritage Site** in 2016.

### **Amaravathi: The rise and fall of one of the greatest Buddhist sites in India**

Chandrababu Naidu's return as Andhra Pradesh CM brings the spotlight back on Amaravati, one of the most important sites of Buddhism in South Asia.

#### **Amaravathi and the Making of Andhra Buddhism**

*Buddhism in the Andhra Region:* Buddhism emerged in the **fifth century BCE** in the ancient kingdom of **Magadh**, located in the eastern Ganges plain of Southern Bihar. It appears to have reached the Andhra region in the Krishna River Valley fairly early on, mainly through trade.

- The real impetus to Andhra Buddhism though, came in the **3rd century BCE** when the emperor **Ashoka** set up an inscription in the region.
- *Thrive:* Buddhism had thrived in the region for almost six centuries till about the 3rd century CE. Although, in isolated sites such as **Amaravathi, Nagarjunakonda, Jaggayapeta, Salihundam** and **Sankaram**, the religion seems to have lingered on till as late as the 14th century CE.

*Significance of Amaravathi:* It was the birthplace of **Mahayana Buddhism**.

- **Acharya Nagarjuna** who propounded the **Madhyamika philosophy** which is the basis of Mahayana Buddhism, lived in Amaravathi for a long time, and his teachings brought about a significant shift in the practice of Buddhism.
- From Amaravathi, Mahayana Buddhism spread across South Asia, China, Japan, Korea and Southeast Asia. Before the cultural revolution in China in 1969, Mahayana Buddhism was the largest faith in the world.

### Holy Buddhist Relic Sites in Andhra Pradesh

The buddhist sites which have yielded relic cascets during excavations in the state of Andhra Pradesh untill Decemèr 2012 C.E.

1. Salihundam
2. Ramathirtham
3. Pavurallakonda
4. Bavikonda
5. Shankaram
6. Kotturu
7. Timmapuram.P
8. Kodavali
9. Guntupalli
10. Gudivada
11. Ghantasala
12. Bhattiprolu
13. Vaddamanu
14. Gummadidurru
15. Amaravthi
16. Jaggayapet
17. Nagarjunakonda

**Distinctive Features of Buddhism developed in Andhra Region**

- Important Patrons: In North India, there are so many legends about Buddha talking to king **Bimbisara or Ajatashatru**, in contrast, Andhra don't have a lot of legends about royal patronage. **Merchants** were important patrons of the Amaravathi Stupa.

- At Amaravathi, patrons came from a broad cross-section of society, especially traders, craftsmen and wandering monks who were involved in accepting and spreading Buddhism.

Easy Absorption of Local Practices into the Buddhist Doctrines: The whole concept of the Buddhist stupa here seems to have been a natural transition from the existing practice of venerating the dead in megalithic burials.

- Amaravathi Megaliths were massive stones set up over pits in which the dead were buried, and are said to have been predecessors of the Buddhist stupas which were commemorative monuments housing the relics of Buddhist monks.
- Other local forms of religious expression popular in the Andhra region such as Goddess and Naga (snake) worship were also incorporated into the Buddhist corpus.

Aesthetic Sculptures: The largest quantity of highly aesthetic sculpture which encased the drum of the stupa and their sheer scale is quite unparalleled.

- They were sculpted on a special kind of limestone called **Palnad marble**, which allowed very fine and intricate carvings.

No External Influence: There is yet no evidence that there was any external influence on the art at Amaravathi, unlike Mathura and Gandhara where there was a lot of **Graeco-Roman influence**.

**Material Used: White marble**

- *Carving of Sculpture:* In a naturalistic manner.

- *Example:* Taming of an elephant by the Buddha.
- *Reflects:* Narratives theme based on life of Buddha and Jataka stories
- *Depiction:* Buddha is depicted both in human as well as in animal form
- Both religious and secular images were present.

*Elegant and Sophisticated:* The sculptured panels of Amaravati are characterised by delicacy of forms and linear grace. Numerous scenes of dance and music adorn these reliefs.

### **The Amaravathi School of Art and its Influence**

- It is regarded as one of the three most important styles of ancient Indian art along with Mathura and Gandhara.
- Amaravathi stupa is popularly known to be the **“jewel in the crown of early Indian art”**.
- *Made Influence on World:* It went on to influence Buddhist artistic productions in several other parts of India, such as the Ajanta caves, as well as other parts of South and Southeast Asia.
- **The Decline of Amaravathi, and Buddhism, in Andhra Region**
- *Rise of Shaivism:* Chinese travelers who came to Andhra in the seventh century CE found that the stupas were on a decline but the Shiva temples were thriving, and receiving patronage from aristocrats and royals.
- *Socio-economic Conditions:* The appeal of Buddhism among traders lay in its emphasis on a casteless society, which meant fewer barriers to conducting commerce. The religion underwent a decline six centuries later with the economic degradation of the region.

- *Colonial Interest in the Monument:* Following **Mackenzie's survey**, a considerable number of sculptures were removed from the site and sent to places like Masulipatam, Calcutta, London, and Madras.
- *No Priority for Conservation:* In the early 19th century when Amaravathi was first surveyed, the conservation of ancient monuments was hardly a priority among government circles.
- Indeed, the local people had regarded the old stupa as convenient sources of building materials, while British officials also used them for construction of canals and roads.
- The British made the first landscape drawings of the **Amaravathi Heritage Town**, but never excavated Amaravathi Stupa in a systematic way.
- *Lack of Consciousness:* Lack of consciousness among Indians, especially Andhra people about their own heritage is equally responsible for the decline of **the "largest Buddhist stupa in South Asia."**
- *Scattered Across the World:* Today the sculptures from the Amaravathi stupa and other sites in Andhra are scattered across the world.
- While the British Museum has one of the largest collections, they can also be found in Chicago, Paris, New York, Chennai and New Delhi among others.
- In recent years Australia remains to be the only country to have returned a stolen Amaravathi style sculpture from **Chandavaram**.
- Australia returned the sculpture because of their own policies on provenance research and repatriation.

### Important Facts

- The first surveyor general of India, **Colonel Colin Mackenzie** started an intensive survey and led to the rediscovery of the grandest Buddhist architectural feat in the Andhra region – the Amaravathi stupa.
- **James Fergusson** published a detailed account of the Amravathi Stupa in his book **Tree and Serpent Worship**. This book “proved to be tremendously influential in the understanding of early Buddhist art and ritual practice”.
- There is not a single university in India that teaches a designated programme on the Amaravathi School of Art, rather it is only the Art Institute of Chicago that does the honours.

### FACTS FOR PRELIMS

**The Jharkhand Governor and Chief Minister recently paid tribute to tribal icon Birsa Munda on his death anniversary.**

Birsa Munda:

- He was a folk hero and a tribal freedom fighter who played a pivotal role in the Indian independence movement, particularly in the tribal regions of British India.
- He belonged to the **Munda tribe** in the **Chhotanagpur Plateau** area.

- He spearheaded an Indian tribal mass movement that arose in the Bihar and Jharkhand belts in the early 19th century under British colonisation.
- Munda rallied the tribals to fight against the forceful **land grabbing** carried out by the **British government**, which would turn the tribals into bonded labourers and force them to abject poverty.
- He influenced his people to realise the importance of owning their land and asserting their rights over it.
- Birsa encouraged the tribe to stick to their traditions and get back to their tribal roots.
- One of Birsa's notable contributions was the formation of the **Munda Rebellion**, also known as the **Ulgulan, or the Tamar Revolt**, in the late 19th century.
- The rebellion was a response to the oppressive policies of the British administration, including the introduction of the **Forest Laws**, that restricted tribal access to their traditional lands, and the imposition of exorbitant taxes.
- Birsa united various tribal communities under the banner of the Munda Raj and led a series of guerrilla warfare campaigns against the British forces.
- Birsa Munda's leadership during the Munda Rebellion earned him the title of "Bhagwan" or "Birsa Bhagwan" among his followers.



- He often took inspiration from Munda traditions, Christianity, and Hinduism to guide his followers in rituals and prayers.
- His struggle against exploitation and discrimination against tribals led to a big hit against the British government in the form of the **Chotanagpur Tenancy Act being passed in 1908**.
- The act restricted the passing on of land from the tribal people to non-tribals.
- Birsa also played a crucial religious role among the Munda people.
- He founded the faith of **Birsait**, a blend of animism and indigenous beliefs, which emphasized the worship of a single god.
- He became their leader and was given the nickname, '**Dharti Aba**' or the father of the earth.
- He died on June 9, 1900, at age 25.
- In recognition of his impact on the national movement, the state of Jharkhand was created on his birth anniversary in 2000.
- November 15, the birth anniversary of Birsa Munda, was **declared 'Janjatiya Gaurav Divas** by the Central Government in 2021.

### **Traditional Medicine Research in India**

- Recently, the World Health Organization (WHO) has designated the National Institute of Indian Medical Heritage, Hyderabad as a **WHO Collaborating Centre** for '**Fundamental and Literary Research in Traditional Medicine**'.

### **Traditional Medicine in India**

- India has a rich heritage of traditional medicine that includes **Ayurveda, Yoga, Naturopathy, Unani, Siddha, Sowa Rigpa, and Homeopathy.**
- **Practices**
  - **Ayurveda and Yoga** are practised widely across the country.
  - **The Siddha system** is followed predominantly in **Tamil Nadu and Kerala.**
  - **The Sowa-Rigpa system** is practised mainly in **Leh-Ladakh and Himalayan regions** such as Sikkim, Arunachal Pradesh, Darjeeling, Lahaul & Spiti.
- These systems have been **integrated into the national healthcare system** with institutionalised education and research councils.
- **WHO describes traditional medicine** as the total sum of the “**knowledge, skills and practises indigenous** and different cultures have used over time to maintain health and prevent, diagnose and treat physical and mental illness.
- **Related Efforts by WHO**
- It has established the **WHO Global Centre for Traditional Medicine in India** to harness their potential through modern science and technology.
- **WHO Collaborating Centre:** In India, there are **approximately 58 WHO Collaborating Centres** spanning various disciplines of biomedicine and allied sciences.
  - The **National Institute of Indian Medical Heritage (NIIMH), Hyderabad** ranks as the **third WHO Collaborating Centre** in the domain of Traditional Medicine, following the **Institute for Teaching**

**& Research in Ayurveda, Jamnagar, and the Morarji Desai National Institute of Yoga (MDNIY), New Delhi.**

- **Efforts made by India**
- **India** has established a **separate Ministry of AYUSH(Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy)** to promote holistic health and well-being.
  - It oversees the growth and development of traditional Indian medicines and Homoeopathy with the objective of making accessible, safe, effective, and quality medicines available to the public.
- **Digital Initiatives and Portals**
  - **AMAR Portal:** Catalogues Ayush manuscripts, with digitised content available.
  - **SAHI Portal:** Displays medico-historical artefacts.
  - **e-Books of Ayush:** Digital versions of classical textbooks.
  - **NAMASTE Portal:** Morbidity statistics from hospitals.
  - **Ayush Research Portal:** Indexes published Ayush research articles.
- **Collections and Publications**
  - **Manuscripts and Library:** Over 500 physical manuscripts, rare books from the 15th century AD.
  - **Journal:** Publishes the Journal of Indian Medical Heritage.

**DRDO developed Woman-led start-up : Divya Drishti**

- Recently, a start-up named Ingenious Research Solutions Pvt Ltd. collaborated with the Centre for Artificial Intelligence & Robotics (CAIR), a

DRDO laboratory based in Bangalore, to develop an AI tool called 'Divya Drishti.'

- 'Divya Drishti' integrates facial recognition with immutable physiological parameters such as gait and skeleton, creating a robust biometric authentication system.
- **Biometric Authentication:** This tool utilises both facial recognition and gait analysis, offering a dual-layered approach that enhances accuracy in identifying individuals and reduces the risks of false positives and identity fraud.
- **Applications:** 'Divya Drishti' has applications across various sectors including Defence, Law Enforcement, Corporate environments, and Public Infrastructure.
- **Supported by:** The development of this AI tool was supported by the Technology Development Fund (TDF), showcasing DRDO's commitment to nurturing start-ups in the defence and aerospace sectors as part of the 'Aatmanirbhar Bharat' initiative.

### **Defence Research and Development Organization (DRDO)**

The Defence Research and Development Organization (DRDO) is India's premier research and development agency under the Ministry of Defence, Government of India. **Objective:** DRDO is mandated with conducting military research and development aimed at achieving self-sufficiency in the defence sector.

### **Centre for Artificial Intelligence and Robotics (CAIR):**

- **About:** CAIR, a prominent DRDO laboratory, specialises in research and development in Artificial Intelligence, Robotics, Command and Control, and Information and Communication Security.
- **Role:** CAIR plays a crucial role in influencing national technology policies, emphasising the importance of national security and fostering self-reliance in advanced technologies.

### Train Accidents in India

Several train accidents have occurred in India over the last decade for multiple reasons, ranging from mechanical failures to human negligence.

Indian Railways is one of the largest rail networks in the world, spanning over **67,000 kilometers and connecting every corner of the country.**

- It serves as the lifeline of transportation for millions.
- There has been an average of **44 consequential train accidents** every year in the five-year period ending 2022-23 (FY23).

#### Train Accidents

- It is an occurrence in the course of working of Railway which does or may affect the safety of the Railway, its engine, rolling stock, permanent way and works, fixed installations, passengers or servant or which affect the safety of others or which does or may cause delay to train or loss to the Railway
- Despite advancements in **technology and infrastructure**, these incidents continue to impact passengers, infrastructure, and the overall economy.

#### Types

- **Derailments** : where a train goes off the tracks, are the most common.

- These can be caused by a variety of factors including track defects, equipment failure, human error, or even sabotage.

- **Collisions:** It occurs when two or more trains collide on the same track, often due to signal failures or errors in communication between railway personnel.
- **Level crossing accidents :** It involves collisions between trains and vehicles or pedestrians at rail crossings, highlighting the need for better safety mechanisms at these points.

### **India's Worst Train Disasters**

– **2024: Kanchanjunga Express train accident** occurred near Rangapani station in the Katihar Railway Division, ahead of New Jalpaiguri Junction

– **2023:** Coromandel Express hit a goods train in Balasore after hitting **Bengaluru-Howrah Superfast Express**, resulting in a tragic triple train crash.

a. Over 300 people were killed, and well over 1,000 were injured.

– **2016:** At least 146 people died when an **Indore-Patna Express train** derailed in Uttar Pradesh on 20 November, causing carriages to crash into each other.

– **2010:** On 28 May, a train derailed and crashed into a freight train about 83 miles west of Kolkata in Bengal, killing 146 and injuring over 200.

– **2002: The luxury Rajdhani Express** from Calcutta to New Delhi plunged into the swollen Dhabi river, killing at least 120 people.

– **1999:** On 2 August, 285 people were killed and 312 injured in a collision between two trains in Gaisal, West Bengal.

– **1998:** At least 210 people were killed when the **Sealdah Express** collided with a derailed train in Punjab.

- **1995:** More than 300 died and 344 were injured on 20 August in a collision between two trains at Firozabad, near Agra.
- **1981:** More than **800 people were killed in India's deadliest rail accident** on 6 June when a train derailed in Bihar and plunged into the river below.
- **1954:** On 28 September, a train travelling between Madras and New Delhi derailed after the collapse of a bridge, leaving at least 137 people dead and 100 injured.

- **Impacts**

- **Casualties and hampers functioning :** The impact of train accidents extends beyond immediate casualties and injuries.
  - Each incident disrupts the smooth operation of the railway network, leading to delays, cancellations, and financial losses.
- **Trust related issues:** It erodes public trust in the safety of train travel, affecting passenger confidence and ridership.
- **Economic cost :** the cost of infrastructure damage, compensation payouts, and the investment required for safety upgrades are substantial.
  - These accidents also have broader implications for industries relying on efficient freight transport, impacting supply chains and logistics

**Challenges**

- The vast railway network faces significant challenges when it comes to safety, with train accidents being a recurring concern.

- The scale of the railway network makes it difficult to monitor and maintain every section of track effectively.
- Issues such as overcrowded trains, inadequate maintenance, and human error continue to pose significant threats to safety.

### **Safety Initiatives**

- The Indian Railways has been proactive in implementing safety measures to mitigate the risk of accidents.
  - This includes regular track inspections, the introduction of modern signaling systems, and the adoption of technology-driven solutions like train collision avoidance systems (TCAS).
- The Supreme Court directed the Indian government to outline preventive measures, including the **'Kavach' train protection system**, following a catastrophic three-train collision in Odisha's Balasore district that claimed nearly 300 lives.
  - It urged immediate action and sought a detailed plan to bolster railway safety, emphasizing the need for expert evaluation, system enhancements, and the 'Kavach' system's swift implementation to avert future accidents.

### **Suggestions and Way Forward**

- **Continued investment in upgrading tracks**, signaling systems, and rolling stock is crucial.
  - Modernizing aging infrastructure can significantly reduce the risk of accidents.



- **Strengthening safety protocols** through better training of railway staff, stricter adherence to operating procedures, and leveraging technology for real-time monitoring and response.
- **Increasing public awareness** about railway safety, including rules at level crossings and onboard safety measures, can prevent accidents involving pedestrians and vehicles.
- **Improved coordination between different stakeholders**—government agencies, railway authorities, and the public—ensures accountability and timely response to safety issues
- **Encouraging research into innovative safety** technologies and practices tailored to Indian conditions can lead to breakthroughs in accident prevention.
- As India continues to develop the demand for safe and reliable rail transport ,It is imperative that safety measures evolve to protect passengers and ensure the continued viability of the railway system.

**Do you know?**

– **KAVACH** is an indigenously developed ATP system by Research Design and Standards Organisation (RDSO) in collaboration with Indian industry and trials facilitated by **South Central Railway** to achieve the corporate objective of safety in train operations across Indian Railways.

a. It is a state of the art electronic system of Safety Integrity Level – 4 standards.

b. It is meant to provide protection by preventing trains from passing the signal at Danger (Red) and avoiding collisions.

c. It activates the train braking system automatically if the driver fails to

control the train as per the speed restrictions. In addition, it prevents collision between two Locomotives equipped with a functional KAVACH system.

### Juneteenth

Observed on **June 19** every year, it marks a pivotal moment in American history. **Juneteenth**, a portmanteau of “**June**” and “**nineteenth**,” is the oldest nationally celebrated commemoration of the **ending of slavery** in the United States.

#### History of Juneteenth

- In **1863**, **US President Abraham Lincoln** issued the **Emancipation Proclamation**, declaring the **freedom of all enslaved people** within the rebellious states.
- However, this proclamation **did not immediately free** all enslaved individuals.
- Many slave owners in Confederate territories — Texas, Arkansas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina and Virginia — refused to comply.
- **Major General Gordon Granger** arrived in Texas and issued **General Order No. 3**, announcing the end of slavery in Texas and **proclaiming that all enslaved people were free**.
- On **June 19, 1865**, the last enslaved African Americans in the Confederate states were **freed**.
- In 2021, the **Juneteenth National Independence Day Act** made Juneteenth a **federal holiday**.

- It became the **first new federal holiday** since **Martin Luther King Jr Day** was established in **1983**.

### **Kolar Gold Fields**

The Cabinet has approved the Central government's proposal to continue the mining activities at the defunct Bharat Gold Mines Limited's (BGML) mine **at kolar gold fields (KGF)**.

- It is located in **Kolar District, Karnataka** and is situated 100 km east of Bangalore.
- The history of Kolar Gold Fields dates back to the early 19th century when gold was first discovered in the area.
- KGF was one of the **deepest gold mines in the world**, reaching depths of over 3,000 meters.
- It was one of the **major gold mining centers in India** until the mines were closed in **2001** due to low gold prices and increasing operational costs.

### **International Yoga Day - 21 June 2024**

The International Day of Yoga, 2024 is being celebrated with the theme **'Yoga for Self and Society'**.

- The National celebration of **10th International Day of Yoga 2024** was organized at Srinagar in Jammu and Kashmir.
- On the occasion, the Ministry of AYUSH launched a **'Common Yoga Protocol Book in Braille'** Script to support the visually impaired to learn and Practice Yoga with convenience.

- Indian Space Research Organisation (ISRO) is organizing a unique initiative '**Yoga for Space**' to mark the International Day of Yoga 2024.
- **Timeline**
- On India's insistence, the UN General Assembly (UNGA) proclaimed 21st June as the International Day of Yoga (IDY) in a resolution adopted in December **2014 during the 69 th session.**
- The first International Yoga Day was celebrated in **New Delhi in 2015.**
- The date of 21 June was chosen as it is the **Summer Solstice in the Northern Hemisphere** and shares a special significance in many parts of the world.

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