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Current Affairs
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High-Level Committee Report on Simultaneous Elections

Why in News?

In a significant move towards electoral reform, the **High-level Committee on Simultaneous Elections,** constituted under the **chairmanship of Shri Ram Nath Kovind,** former President of India, has proposed simultaneous elections for **Lok Sabha**, state Assemblies, and local bodies in India.

- The committee's report, submitted to President Droupadi Murmu, outlines comprehensive recommendations and amendments to the Constitution to facilitate this monumental change.

What are the Recommendations of the High-level Committee on Simultaneous Elections?

- **Transition to Simultaneous Elections:**
  - Amendment to Article 82A:
    - The Committee suggests amending **Article 82A of the Constitution** to empower the President to designate an **"Appointed Date"** for the commencement of simultaneous elections to the House of the People and Legislative Assemblies.
      - State assemblies going to poll after this date would synchronize their terms with the Parliament, facilitating simultaneous elections.
  - Term Synchronization:
    - If the recommendations are accepted and implemented after the **2024 Lok Sabha polls**, the first simultaneous elections could potentially be held in 2029.
      - Alternatively, if targeting the 2034 polls, the appointed date would be identified after the 2029 Lok Sabha polls.
    - States with elections due between **June 2024 and May 2029** would see their terms expire alongside the **18th Lok Sabha,** even if it results in some state assemblies **having terms of less than five years as a one-time measure.**
      - States like West Bengal, Tamil Nadu (2026), Punjab, Uttarakhand, Uttar Pradesh (2027), and Karnataka, Chhattisgarh, Telangana (2028) would synchronise their election cycles.
    - The government elected after the 2024 polls would decide on the starting point for implementing simultaneous elections, either targeting 2029 or 2034 based on their preference.
    - To maintain synchronicity **in case of premature dissolution** of Parliament or a state assembly, the committee recommended **conducting fresh elections only for the remaining term, or the "unexpired term"** until the next cycle of simultaneous polls.
      - This measure ensures that any hung House or **no-confidence motion** does not affect the overall timeline for simultaneous elections.

Note:

- Synchronisation of Local Body Elections:
  - Parliament is advised to enact legislation, possibly through the **introduction of Article 324A**, to ensure the synchronization of **Municipalities and Panchayats elections with General Elections.**
  - This legislation would determine the terms of local bodies and align their election schedules with national electoral timelines.
- Electoral Roll Preparation and Management:
  - The Committee suggests amending **Article 325 of the Constitution** to enable the **Election Commission of India(ECI)** to prepare a **single electoral roll and Elector's Photo Identity Card (EPIC)** applicable to all tiers of government in consultation with State Election Commissions.
    - The electoral rolls for Lok Sabha are prepared and maintained by the ECI, while the electoral rolls for local bodies are prepared by the SEC.
    - The Committee emphasises the importance of harmonisation between the ECI and **State Election Commissions (SECs)** to prevent duplication and safeguard voter rights.
- Logistical Arrangements and Expenditure Estimation:
  - The Committee calls for the ECI to submit detailed requirements and **expenditure estimates for simultaneous elections.**
  - To ensure seamless logistical arrangements, the Committee urges the ECI and SECs to develop comprehensive plans and estimates.
    - These plans should encompass equipment needs, personnel deployment, and security measures.
- **Impact on Governance and Development:**
  - The Committee underscores the importance of certainty in governance for effective decision-making and sustained development.
  - It highlights the role of synchronized elections in averting policy paralysis and fostering a conducive environment for progress.

What are the Debates Regarding Simultaneous Elections?

- **Arguments in Favour:**
  - **Cost Efficiency:**
    - Holding simultaneous elections **reduces the substantial recurring expenditure** incurred by both the State and Central governments.
    - Consolidating elections into **one event minimises the costs associated** with voter registration, polling stations, election staff, security deployment, and other logistical requirements.
    - With a single electoral roll for all elections, administrative resources such as security forces and civilian officials are utilised more efficiently, saving public funds that can be redirected to other public causes.
  - **Enhanced Governance and Administration:**
    - Simultaneous elections streamline the electoral process, reducing the **strain on governance and administration** caused by frequent elections.
      - Prolonged deployment of security and police forces during separate elections **can strain national security and law enforcement efforts**, which can be alleviated by holding elections simultaneously.
    - The **mass-scale transfers of officials and the disruption** caused by the **code of conduct** during separate elections can impede the smooth functioning of government machinery, which can be mitigated through synchronised polls.
  - **Reduced Influence of Money in Politics:**
    - Holding simultaneous elections **can lessen the role of money in politics by reducing the frequency of election campaigns** and associated expenses.
      - Campaign finance regulations can be more effectively enforced by the ECI at a national level, ensuring a level playing field for all parties and candidates.
  - **Mitigation of Divisive Politics:**
    - The **'one nation-one election' concept** aims to reduce the divisive impact of regionalism, casteism, and communalism in mobilising voters.
      - By focusing on national issues and promoting a unified electoral agenda, simultaneous elections can help transcend narrow interests and foster a sense of national unity.
  - **Enhanced Voter Engagement:**
    - **Voter fatigue**, resulting from frequent elections at different levels, can be alleviated by consolidating polls into a single event.

Note:

- Simultaneous elections can potentially **increase voter turnout at the national level** by reducing voter apathy and increasing the significance of each electoral exercise.

➢ **Arguments Against Simultaneous Elections:**

❍ **Federalism and Regional Representation:**

- Simultaneous elections may undermine the **principles of federalism by centralising the electoral process** and potentially overshadowing regional and local issues with national issues.
  - Constituent States, especially those governed by **non-dominant parties at the national level,** may feel **marginalised or inadequately represented** in a synchronised election scenario.
  - National parties could gain an undue advantage over regional parties, undermining the federal spirit enshrined in the Constitution.

❍ **Cost Implications:**

- The implementation of simultaneous elections would require a significant investment in procuring additional **Electronic Voting Machines (EVMs)** and **Voter Verifiable Paper Audit Trail Machines (VVPATs)**, adding to the financial burden.
- Biennial elections to Legislative councils/Rajya Sabha and by-elections would still necessitate separate polling events, contributing to ongoing costs despite synchronised elections.

❍ **Impact on Accountability and Representation:**

- Frequent elections at different levels of government help **maintain accountability among elected representatives** and ensure regular opportunities for voters to express their preferences.
  - Synchronising elections **may reduce the frequency of electoral accountability checks** and limit the responsiveness of elected officials to the evolving needs of their constituents.

❍ **Required Constitutional Amendments:**

- India's parliamentary democracy allows for the dissolution of Lok Sabha and State assemblies before the completion of their five-year terms.
  - Fixed tenure of five years for all houses necessitates constitutional amendments to **Articles 83, 85, 172, and 174, dealing with duration and dissolution.**
  - Amendments to Article 356, governing the imposition of President's rule in States, would also be required to accommodate simultaneous elections.

❍ **Security Implications:**

- During simultaneous elections, **deploying large security forces for election duty** could potentially **weaken national security,** as it diverts them from border protection.

What are the Constitutional Provisions Regarding the Simultaneous Elections?

Constitutional Provision	Description
Article 83	Specifies the duration of the Lok Sabha (House of the People), stating that it shall continue for five years from its first meeting unless dissolved earlier.
Article 172	Pertains to the duration of State Legislative Assemblies, declaring that a Legislative Assembly shall continue for **five years from the date of its first meeting.**
Article 324	Empower the ECI to supervise, direct, and control the preparation of electoral rolls and conduct of elections to the **Parliament,** State Legislatures, and the offices of the President and Vice-President.
Article 356	Allows for the imposition of the **President's Rule** in a State in case of failure of the constitutional machinery, leading to direct rule by the President through the Governor.
Representation of People Act, 1951	Provides the legal framework for conducting elections in India, covering aspects such as electoral rolls, qualifications for membership, and election conduct.

Note:

History of Simultaneous Elections in India

- Simultaneous elections in India, where both the Lok Sabha and State Legislative Assemblies are elected together, were practised during the initial years after independence in **1952, 1957, and 1962.**
  - However, due to various factors such as political instability, early dissolution of State Assemblies, and the need for separate elections to address regional issues, the practice of simultaneous elections gradually faded.
- In 2019, only four States **(Andhra Pradesh, Arunachal Pradesh, Odisha, and Sikkim)** had their assembly elections, along with the Lok Sabha.

Countries with Simultaneous Elections

- **South Africa:**
  - Elections to the National Assembly and provincial legislatures occur simultaneously every five years.
  - The President of South Africa is elected by the National Assembly.
- **Sweden:**
  - The Prime Minister of Sweden is elected by the legislature every four years.
- Germany:
  - The Chancellor of Germany is elected by the legislature every four years.
  - Lack of confidence in the Chancellor can only be resolved by electing a successor.
- **Britain:**
  - The Fixed-term Parliaments Act, 2011 was passed to provide a sense of stability and predictability to the British Parliament and its tenure. It provided that the **first elections would be held on the 7th of May, 2015** and on the first Thursday of May every fifth year thereafter.

What are the Various Other Recommendations Regarding the Simultaneous Elections?

- **Previous Reports:**
  - The issue of simultaneous elections has been addressed in reports by the **Law Commission (1999),** and the **Parliamentary Standing Committee on Personnel, Public Grievances, Law and Justice (2015)**. Additionally, the **Law Commission submitted a draft report in 2018.**
- **Recommendations Summary:**
  - **Clubbing Elections:**
    - Proposals suggest combining **Lok Sabha elections with nearly half of the State assembly elections in one cycle** while holding the remaining State assembly elections in another cycle after two and a half years.
      - This would require amending the Constitution and the **Representation of the People Act, 1951,** to adjust the tenures of existing assemblies.
  - **No-Confidence Motion:**
    - Any **no-confidence motion** in the Lok Sabha or Legislative Assembly should be accompanied by a **confidence motion for forming an alternate government.**
      - If dissolution of the Lok Sabha or State Assembly is unavoidable, the newly constituted House should serve only the **remainder period of the original House**, discouraging premature dissolution and encouraging exploration of forming an alternate government.
  - **Bye-Elections:**
    - Bye-elections due to death, resignation, or disqualification of members can be grouped together and conducted once a year for efficiency.

Green Elections in India

Why in News?

Recently, the **Election Commission of India (ECI)** voiced its concern over the environmental risks associated with the use of **non-biodegradable materials** in elections.

- It has been urging parties and candidates to avoid the use of plastic/polythene for preparation of election material during an election campaign, since 1999.

Why Is There a Need for a Shift Toward Green Elections?

- **Environmental Footprint of Traditional Elections:** Traditional election processes have significant environmental consequences due to various factors:
  - **Campaign Flights:** The emissions from campaign flights during elections contribute significantly to the overall carbon footprint.

Note:

- **For example:** In the 2016 US presidential elections, the emissions from just one candidate's campaign flights were equivalent to the annual carbon footprint of 500 Americans.

- **Deforestation and Other Issues :** Reliance on paper-based materials for ballots, campaign literature, and administrative documents leads to deforestation and energy-intensive production processes.
- **Energy-Saving:** Large-scale election rallies with loudspeakers, lighting, and other energy-consuming equipment contribute to energy consumption and emissions.
- **Waste Generation:** PVC flex banners, hoardings, and disposable items used during campaigns add to waste generation and environmental impact.

What is Carbon Footprint?

- As per the World Health Organization (WHO), a carbon footprint quantifies the influence of human activities on **carbon dioxide (CO_2) emissions** generated from burning **fossil fuels,** typically measured in **metric tons of CO_2 emissions.**
- It is gauged in terms of annual **CO_2 emissions**, a metric that may include additional greenhouse gasses such as methane, nitrous oxide, and other **CO_2-equivalent gasses.**
- It can be a broad measure or be applied to the actions of an individual, a family, an event, an organization, or even an entire nation.

What is the Concept of Green Elections?

- **Green Elections:** Green elections are practices that aim to reduce the environmental impact of electoral processes. They involve measures such as using recycled materials, promoting electronic voting, and encouraging candidates to adopt sustainable campaign practices.
- Green elections aim to minimize the environmental impact of electoral processes through:
  - **Eco-Friendly Campaign Materials:** Candidates and parties can adopt sustainable alternatives such as recycled paper, biodegradable banners, and reusable materials.
  - **Reducing Energy Consumption:** Opting for energy-efficient lighting, sound systems, and transportation during rallies can help reduce the carbon footprint.
  - **Promoting Digital Campaigns:** Leveraging digital platforms for campaigning (websites, social media, and email) reduces paper usage and energy consumption.

What are Successful Examples of Eco-friendly Electoral initiatives?

- **Example from India:**
  - **Kerala's Green Campaign:**
    - During the **2019** general election, the **Kerala State Election Commission** took a proactive step by urging political parties to avoid single-use plastic materials during their campaigns.
      - **Single-use plastic** is a disposable material that can be used only once before it is either thrown away or recycled, like plastic bags, water bottles, soda bottles, straws, plastic plates, cups, most food packaging and coffee stirrers are sources of single use plastic.
    - Subsequently, the **Kerala High Court** imposed a ban on **flex and non-biodegradable materials** in electioneering.
    - As an alternative, wall graffiti and paper posters emerged, promoting a more sustainable approach. Additionally, government bodies collaborated with the district administration in Thiruvananthapuram to ensure a green election, emphasizing eco-friendly practices. Training sessions were also conducted in villages for election workers to raise awareness and promote environmentally conscious behavior.
  - **Goa's Artisan-Crafted Eco-Friendly Booths**
    - In 2022, the **Goa State Biodiversity Board** took a significant step by introducing eco-friendly election booths for the Assembly elections.
    - These booths were constructed using biodegradable materials meticulously crafted by local traditional artisans from Sattari and Ponda.
      - Not only are these materials environmentally friendly, but they also support local artisans.
  - **Sri Lanka's Carbon-Sensitive Campaign**
    - In 2019, Sri Lanka's Podujana Peramuna (SLPP) party launched the world's first carbon-sensitive environmentally friendly election campaign.

Note:

- They meticulously measured carbon emissions from campaign activities, including vehicles and electricity usage.
- To offset these emissions, they engaged the public in tree planting initiatives across each district.
- This innovative approach not only reduced the campaign's carbon footprint but also raised awareness about the importance of forest cover.

➢ **Overseas Example:**

❍ **Estonia's Digital Voting Revolution**

- Estonia laid the foundations for digital voting as an alternative to traditional paper-based methods.
- Their approach encouraged voter participation while significantly reducing the environmental impact.
- By implementing robust security measures, Estonia demonstrated that digital voting can be both eco-friendly and electorate-friendly. The success of this approach suggests that other democracies can follow suit.

➢ These examples demonstrate that prioritizing environmental considerations in electoral processes can set an example for other nations and contribute to a more sustainable future.

What are the Challenges in Adoption of Green Elections?

➢ **Access to New Technologies and Training for Officials:** Ensuring that all voters have fair access to new technologies is crucial. However, this requires substantial efforts in terms of training election officials and educating voters about the new systems. Some specific challenges include:

❍ **Training and Familiarization:** Election officials need to be proficient in operating and troubleshooting the new technology. Adequate training programs are essential to bridge the knowledge gap.

❍ **Equitable Access:** Ensuring that all voters, including those in remote or underserved areas, can access and use the technology is a challenge. Addressing disparities in internet connectivity and digital literacy is vital.

➢ **Financial Constraints and Upfront Costs:** Implementing eco-friendly materials and advanced technology often comes with significant upfront costs. Governments, especially those with limited budgets, may hesitate due to financial constraints.

❍ **Budget Allocation:** Allocating funds for technology upgrades while balancing other essential services is a delicate task. Prioritizing modernization within budget limitations is challenging.

❍ **Long-Term Savings:** Although initial costs may be high, emphasizing the long-term benefits (such as reduced paper usage and streamlined processes) can help justify the investment.

➢ **Cultural Inertia and Voter Behavior:** Traditionally, voting has been associated with physical presence at polling booths. Overcoming cultural inertia and changing voter behavior is essential for successful modernization:

❍ **Perceived Importance of Physical Voting:** Many voters view physically going to the polls as a sacred civic duty. Convincing them that digital alternatives are equally valid can be challenging.

❍ **Trust in New Systems:** Building trust in electronic voting systems is critical. Public skepticism about security, privacy, and potential manipulation must be addressed through transparency and robust safeguards.

➢ **Security Concerns and Compromises:** Introducing new approaches, such as online voting or blockchain-based systems, raises concerns about vote security:

❍ **Cybersecurity Risks:** Ensuring that voting systems are secure from cyber threats is paramount. Any compromise could undermine public trust and the integrity of elections.

❍ **Balancing Security and Accessibility:** Striking the right balance between robust security measures and user-friendly interfaces is a challenge. Rigorous security protocols should not hinder ease of use.

Using AI in Elections

Why in News?

As AI evolves towards mimicking human capabilities evolving from **Generative Artificial Intelligence (GAI)** to **Artificial General Intelligence (AGI)**, its impact on elections, exemplified by India's upcoming polls, underscores the **imperative of addressing its potential influence.**

Note:

- AGI refers to the hypothetical ability of an AI to understand, learn, and apply knowledge in a manner **similar to human intelligence across** a wide range of tasks and domains.
- AGI aims to **replicate the cognitive abilities of humans**, such as reasoning, problem-solving, perception, and understanding natural language.

How is AI Linked with the Electoral Landscape?

- **Campaign Strategy and Targeting:**
  - Political parties and candidates can use **AI algorithms to analyse vast amounts of data about voters**, including demographics, social media activity, and past voting behaviour, to tailor their campaign messages and target specific voter groups more effectively.
- **Predictive Analytics:**
  - AI-powered predictive analytics **can forecast election outcomes** by analysing various factors such as polling data, economic indicators, and sentiment analysis from social media.
  - This can help **parties allocate resources strategically** and focus on key battleground areas.
- **Voter Engagement:**
  - AI chatbots and virtual assistants can engage with voters on social media platforms, answering questions, providing information about candidates and policies, and even encouraging voter turnout.
  - This can enhance voter engagement and participation in the electoral process.
- **Security and Integrity:**
  - AI-powered tools can be employed to detect and prevent election fraud, including voter suppression, tampering with electronic voting systems, and the spread of disinformation. By analysing patterns and anomalies in data, AI algorithms can help ensure the integrity of the electoral process.
- **Regulation and Oversight:**
  - Governments and election authorities can use AI to monitor and regulate political advertising, identify violations of campaign finance laws, and ensure compliance with electoral regulations. AI-powered tools can help enforce transparency and accountability in the electoral process.
    - In 2021, the **Bihar Election Commission tied up** with AI firm **Staqu to use video analytics** with **optical character recognition (OCR)** to analyse CCTV footage from counting booths during the panchayat elections.
    - The system enabled the Bihar Election Commission to achieve **complete transparency and eliminate any chances** of manipulation.

What are the Concerns of Deploying AI for Electoral Purposes?

- **Manipulation of Electoral Behavior:**
  - AI models, particularly **Generative AI and AGI** can be used to **spread disinformation, create deep fake elections**, and inundate voters with highly personalised propaganda, leading to confusion and manipulation of democratic processes.
  - Using AI, Deepfake Videos of opponents **can be created to tarnish their image.**
    - The term "Deep Fake Elections" refers to the use of AI software to create convincing fake videos, audios, and other content that can deceive voters and influence their decisions.
    - This phenomenon poses a serious threat to the **integrity of elections and undermines public trust in the electoral process.**
  - One prominent example highlighting the potential dangers of **such manipulation is the Cambridge Analytica scandal.**
    - Cambridge Analytica, a now-defunct political consulting firm, notoriously **exploited Facebook data to create targeted political advertisements** and influence v**oter behavior during the 2016 United States presidential election** and other campaigns globally.
- **Messaging and Propaganda:**
  - AI tools can be **trained to translate in regional languages** which can be used by the candidates for Microtargetting in their campaign.
    - Microtargeting is a marketing strategy that uses recent technological developments and reaching out to specific segments of a larger audience based on **detailed demographic, psychographic, behavioral, or other data**.
  - AI can also be used for the **customisation of political campaigns** based on the local dialect and demography of the voter base.

Note:

- **Spreading Disinformation:**
  - The **World Economic Forum's (WEF's) Global Risks Perception Survey**, ranks misinformation and disinformation among the top 10 risks, with easy-to-use interfaces of large-scale AI models enabling a boom in false information and "synthetic" content - from sophisticated voice cloning to fake websites.
    - AI can be used to inundate voters with highly personalised propaganda on a scale that could make the Cambridge Analytica scandal appear microscopic, as the persuasive ability of AI models would be far superior to the bots and automated social media accounts that are now baseline tools for spreading disinformation.
    - The risks are compounded by social media companies such as Facebook and Twitter significantly cutting their fact-checking and election integrity teams.
- **Inaccuracies and Unreliability:**
  - AI models, including AGI, are not infallible and can produce inaccuracies and inconsistencies.
  - There has been public wrath worldwide over Google AI models, including in India, for their portrayal of persons and personalities in a malefic manner, mistakenly or otherwise. These reflect well **the dangers of 'runaway' AI.**
    - Inconsistencies and undependability stalk many AI models and pose inherent dangers to society. As its potential and usage increases in geometric proportion, threat levels are bound to go up.
- **Ethical Concerns:**
  - The use of AI in elections raises ethical questions about privacy, transparency, and fairness.
  - AI algorithms may inadvertently **perpetuate biases present in training data**, leading to unfair treatment or discrimination against certain groups of voters.
  - Moreover, the lack of transparency in AI decision-making processes can **erode public trust and confidence in electoral outcomes.**
  - Parties having better r**esources can have better utilisation of A**I in comparison to the small and regional parties with lesser resources, which may disrupt the **level playing field in the elections.**
- **Regulatory Challenges**:
  - Regulating the use of AI in electoral campaigns presents significant challenges due to the rapid pace of technological advancements and the global nature of online platforms.
  - Governments and election authorities struggle to keep pace with evolving AI techniques and may lack the necessary expertise to effectively regulate AI-driven electoral activities.
  - The primary statutes that could potentially trigger if fake news is spread using deepfakes are, The **India Penal Code, 1860** (or the Bharatiya Nyaya Sanhita, 2023 in due course) **Information Technology Act, 2000**; and the **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021**.
    - However, there doesn't exist a specific law **that addresses just AI and deepfake technology** and targeting the individual who creates it.

How to Deal With the Impacts of AI on Elections?

- **Issuing MCC-like Guidelines to Address the Misuse of AI:**
  - The menace of **misinformation has existed for a longer period**, and the advent of **AI technology has turbocharged** the spread of fake news.
    - In the context of Lok Sabha elections 2024, one possible solution to AI-fueled misinformation would be **guidelines issued by the Election Commission of India.**
  - There is a need to Implement regulations that **require transparency in the use of AI algorithms** for political purposes.
    - This includes **disclosing sources of funding for political advertisements** and requiring platforms to disclose how algorithms determine the content users see.
- **Education and Media Literacy:**
  - Invest in educational programs to teach citizens how to **critically evaluate information online and identify disinformatio**n and deep fakes.
  - Promote media literacy to help v**oters distinguish between credible and unreliable source**s of information.

Note:

- **Enhanced Fact-Checking:**
  - Establishing a **Rapid Response Team to address the dissemination** of fake news, deep fakes, and other forms of misinformation during elections is crucial.
    - While it's inevitable that fake videos and misinformation will arise, the key lies in swiftly addressing them before they **escalate and spread widely**.
  - Strengthen fact-checking efforts by providing resources to independent organisations and journalists to verify the accuracy of information circulating online.
  - Develop AI-powered tools to **identify and flag misleading content.**
- **Counter-Narratives and Debunking Campaigns:**
  - Launch public awareness campaigns that debunk false information and provide accurate counter-narratives.
  - Utilise AI to identify trending **misinformation and target counter-messages** effectively.
- **Ethical AI Development:**
  - Encourage the development of AI technologies with ethical considerations in mind, such as minimising bias, protecting privacy, and promoting transparency.
  - Establish standards and guidelines **for the responsible use of AI in political contexts.**
- **International Cooperation:**
  - Foster collaboration between governments, tech companies, and international organisations to address the global challenges posed by AI-driven disinformation campaigns. Share best practices and coordinate efforts to combat election interference across borders.

What are India's Initiatives Related to Artificial Intelligence?

- INDIAai.
- Global Partnership on Artificial Intelligence (GPAI).
- US India Artificial Intelligence Initiative.
- Responsible Artificial Intelligence (AI) for Youth.
- Artificial Intelligence Research, Analytics and Knowledge Assimilation Platform.
- Artificial Intelligence Mission.

Model Code of Conduct

Why in News?

Recently, the Model Code of Conduct (MCC) has come into force with the announcement of voting dates for the Lok Sabha elections 2024 by the Election Commission of India (ECI), marking a significant aspect of electoral governance.

What is MCC and its Evolution?

- **About:**
  - The MCC is a **consensus document**. The political parties have themselves agreed to keep their conduct during elections in check and to work within the Code.
  - It helps the EC in keeping with the mandate it has been given under **Article 324 of the Constitution,** which gives it the **power to supervise** and **conduct** free and fair elections to the Parliament and State Legislatures.
  - The MCC is operational from the date on **which the election schedule is announced until the date of the result announcement.**
  - The government **cannot announce any financial grants,** promise construction of roads or other facilities, and make any ad hoc appointments in government or public undertaking during the time the Code is in force.
- **Enforceability of MCC:**
  - Though the **MCC does not have any statutory backing**, it has come to acquire strength in the past decade because of its strict enforcement by the EC.
    - Certain provisions of the MCC may be enforced by invoking corresponding provisions in other statutes such as the **Indian Penal Code (IPC) 1860, Code of Criminal Procedure (CrPC) 1973,** and **Representation of Peoples's Act (RPA) 1951.**
- **Evolution of MCC:**
  - **Kerala** was the **first state to adopt a code of conduct for elections.** In 1960, before the Assembly elections in the state, the administration prepared a draft code covering important aspects of electioneering such as processions, political rallies, and speeches.

Note:

- **In 1974, the ECI released a formal MCC**. It also set up bureaucratic bodies at the district level to oversee its implementation. **Before 1977, MCC guided only political parties and candidates.**
- In 1979, the Election Commission learned of **ruling parties misusing power** like monopolising public spaces and using public money for advertisement. The **Election Commission revised MCC to include ruling political parties.**
- The revised MCC had seven parts, **with one for the ruling parties' behaviour** after the election announcement.
  - Part I: General good behaviour for candidates and parties.
  - Parts II and III: Rules for public meetings and processions.
  - Parts IV and V: Guidelines for behaviour on polling day and at polling booths.
- The MCC has been revised on several occasions since 1979, with the last time being in the year 2014.

➢ **Key Provisions of MCC:**

- **General Conduct:**
  - No party or candidate shall include in any activity that may aggravate existing differences or **cause tension between different castes and communities, religious or linguistic**.
  - Similarly, **Section 123(3) of the Representation of the People Act, 1951**, disallows the usage of religion, race, caste, community, or language to promote enmity or hatred among the people and use of it as a political tool.
  - **Criticisms directed towards other political parties** should be restricted to an evaluation of their policies, historical performance, and initiatives, **refraining from personal attacks.**
- **Meetings and Processions:**
  - Parties must **inform the local police authorities of the venue and time** of any meeting to enable the police to make adequate security arrangements.
  - If **two or more candidates plan processions** along the **same route,** the political parties must establish contact in advance to ensure that the **processions do not clash.**
  - **Carrying and burning effigies** representing members of other political parties is **not allowed.**
- **Polling Day:**
  - Only voters and those with a valid pass from the EC are allowed to enter polling booths.
  - All authorised party workers at **polling booths should be given suitable badges or identity cards.**
    - Identity slips supplied by them to voters **shall be on plain (white)** paper and **shall not contain any symbol, name of the candidate or the name of the party.**
    - The **EC will appoint observers** to whom any candidates may report problems regarding the conduct of the election.
- **Party in Power:**
  - The MCC incorporated certain restrictions in 1979, regulating the conduct of the party in power. **Ministers must not combine official visits with election work or use official machinery for the same.**

What are the Issues Associated with MCC?

➢ **Enforcement Challenges**: Enforcement of the MCC can be inconsistent or inadequate, leading to violations that may go unpunished **due to lack of statutory backing.**
- The **ECI opposes the legalisation of the MCC,** citing the need for swift **completion of elections within approximately 45 days,** making legal enforcement impractical due to lengthy judicial processes.

➢ **Ambiguity:** Certain provisions of the MCC may be vague or open to interpretation, leading to confusion among political parties and candidates.

➢ **Limited Scope**: Critics argue that the MCC's scope should be expanded to cover a wider range of issues, including **electoral funding**, **social media usage, and hate speech.**

➢ **Timing Issues**: The MCC comes into effect **only during election periods**, leaving room for misconduct outside of these periods.

Note:

- **Impact on Governance**: Some argue that the MCC's restrictions on government announcements and activities during election periods may hinder the functioning of governance.
- **Need for Reform**: There are calls for reforming the MCC to address its shortcomings and make it more effective in ensuring fair and transparent elections.

Banning Cotton Candy

Why in News?

Recently, Himachal Pradesh has instituted a one-year ban on the production, sale and storage of Cotton Candy or Candy floss after the presence of **Rhodamine B**, a potentially hazardous colouring agent.

- The ban is on the heels of states like Karnataka, Tamil Nadu and Goa, which have implemented **similar restrictions on harmful colouring agents.**
- Consumption of snacks containing these artificial colours may pose long-term health risks, including **Cancer**.

What is Cotton Candy?

- Cotton candy, also known as **candy floss or fairy floss** in some regions, is a **type of spun sugar confectionery** that is typically served at carnivals, fairs, and amusement parks.
- It is made by heating and liquefying sugar and then spinning it out through tiny holes where it re-solidifies in long strands.
- These strands are gathered onto a **cone or stick, forming a fluffy, cotton-like texture.**

What is Rhodamine B?

- **About:**
  - **Rhodamine B** is a colouring agent commonly used in textile, paper, and leather industries. The colourant is l**ow-cost and is sometimes used to give vibrant hue**s to popular street food items such as gobi manchurian and cotton candy.
  - The dye is not fit for consumption and may lead to acute toxicity. Exposure to the chemical may also damage the **eye and cause irritation in the respiratory tract.**
    - While the **World Health Organisation**, which maintains a list of cancer-causing agents, says it cannot be classified as carcinogenic to humans, there are s**ome studies on rats that have shown carcinogenic effects.**
- **Usage in Food Products:**
  - It is not commonly added to food products, Rhodamine B is usually reported from small roadside vendors in small cities.
    - This is because of a **lack of understanding about dyes** that are permissible in food items. Small vendors are n**ot aware that this dye can be harmful as its effects might not always be felt immediately**.
    - It is usually "illegally" **added to preparations such as gobi manchuria**n, potato wedges, butter chicken, pomegranate juice, ice creams produced on a small scale, or cotton candies.
- **Legality:**
  - **Food Safety and Standards Authority of India (FSSAI)** has specifically banned **Rhodamine B** from being used in food products.
  - Any use of this chemical in the preparation, processing, and distribution of food is punishable **under the Food Safety & Standards Act, 2006.**

What Food Colours are Allowed by the Food Safety Act, 2006?

- The **FSSAI** allows the use of very few natural and synthetic colours in food items. They are,
  - **The Natural Food Colours:**
    - **Carotene and Carotenoids (yellow, orange):** These are natural pigments found in many fruits and vegetables, such as carrots, pumpkins, and tomatoes. They are responsible for the yellow, orange, and red colors in these foods.
    - **Chlorophyll (green):** Chlorophyll is the pigment responsible for the green colour in plants. It is commonly used as a natural food colouring agent.

Note:

- **Riboflavin (yellow):** Riboflavin, also known as vitamin B2, is a yellow-coloured compound found in various foods. It is sometimes used as a food colouring agent.
- **Caramel:** Caramel is a natural food colouring agent derived from the heating of sugar. It can range in colour from pale yellow to deep brown, depending on the degree of caramelization.
- **Annatto (Orange-Red):** Annatto is a natural food colouring derived from the seeds of the achiote tree. It imparts a vibrant orange-red colour to foods and is commonly used in cheese, butter, and other dairy products.
- **Saffron:** Saffron is a spice derived from the **flower of the Crocus sativus plant.** It is known for its intense yellow colour and is one of the most expensive spices in the world.
- **Curcumin (Yellow, from Turmeric):** Curcumin is the main active compound found in turmeric. It is responsible for the yellow colour of this spice and is used as a natural food colouring agent.

❍ **The Synthetic Colours:**

- **Ponceau 4R:** A synthetic red colour commonly used in various food and beverage products.
- **Carmoisine:** Another synthetic red colour often used in food colouring.
- **Erythrosine:** A synthetic red colour commonly used in food colouring, especially in sweets and candies.
- **Tartrazine and Sunset Yellow FCF:** Synthetic yellow colours widely used in various food products.
- **Indigo Carmine and Brilliant Blue FCF:** Synthetic blue colours used in food colouring.
- **Fast Green FCF:** A synthetic green colour used in food products.

➢ Even permissible food colourings, however, are not allowed in all food items. Some food items that can **use these colours include ice creams, biscuits, cakes**, confectioneries, fruit syrups and crushes, custard powder, jelly crystals, and carbonated or noncarbonated beverages.

What is the Food Safety and Standards Authority of India?

➢ **About:**

❍ FSSAI is an autonomous statutory body established under the Food Safety and Standards Act, of 2006.

- The Act of 2006, consolidates various laws related to food, such as the Prevention of Food Adulteration Act, 1954, the Fruit Products Order, 1955, the Meat Food Products Order, 1973, and other acts that were previously handled by different ministries and departments.
  - The **Act also aims to establish a single reference point for all matters relating to food safety a**nd standards, by moving from multi-level, multi-departmental control to a single line of command.

❍ FSSAI is responsible for protecting and promoting public health by regulating and supervising food safety and quality in India, operating under the Ministry of Health & Family Welfare.

❍ FSSAI has a headquarters in New Delhi and regional offices in eight zones across the country.

❍ The Chairperson and Chief Executive Officer of FSSAI, appointed by central government. The Chairperson is in the rank of Secretary to the Government of India.

➢ **Functions and Powers:**

❍ Framing of regulations and standards for food products and additives.

❍ Granting of licences and registration to food businesses.

❍ Enforcement of food safety laws and regulations.

❍ Monitoring and surveillance of food safety and quality.

❍ Conducting risk assessment and scientific research on food safety issues.

❍ Providing training and awareness on food safety and hygiene.

❍ Promoting food fortification and organic food.

❍ Coordinating with other agencies and stakeholders on food safety matters.

Note:

- **Events and Campaigns:**
  - World Food Safety Day.
  - Eat Right India.
    - Eat Right Station.
    - Eat Right Mela.
  - State Food Safety Index.
  - RUCO (Repurpose Used Cooking Oil).
  - Food Safety Mitra.
  - 100 Food Streets.

Patents (Amendment) Rules, 2024

Why in News?

Recently, the Ministry of Commerce and Industry has notified the **Patents Amendment Rules, 2024** making significant changes to Indian patent practice and procedure.

What are the Key Changes Introduced Under Patents (Amendment) Rules, 2024?

- **Reduced timeline for filing a Request for Examination (RFE):** The timeline for filing the RFE is now reduced from 48 months to 31 months from the priority date.
  - The **reduced timeline for filing a** Request for Examination **(RFE) will accelerate the patent examination process.**
- **Simplified Submission of Form 3:** Applicants can simply file a single updated Form 3 after receiving the **First Examination Report (FER)**.
  - The Patent office issues an examination report to the applicant which is generally known as FER.
- **Introduction of 'Certificate of Inventorship'**: To recognise inventors' contributions to patented inventions.
  - As the Indian patent certificate does not identify the inventors, this provision will allow inventors to be identified for their inventions.
- **Frequency of filing statements:** The frequency of filing working patents was reduced from once in a financial year to once in every three financial years.
- **Amendments in Pre-grant and Post-grant Opposition Procedures:** The time frame for submission of recommendations by an Opposition Board and the response time for applicants have been adjusted.
  - A divisional application can be filed in respect of an invention disclosed in the provisional or complete application or a further divisional application.
  - This amendment is in alignment with the recent decision of the Delhi High Court in ***Syngenta Limited v. Controller of Patents and Designs Case, 2023***.
    - In this the court clarified that **divisional applications may be filed in respect of parent applications** where the complete or provisional specification (and not necessarily the claims) of the parent application disclose a plurality of inventions.

What is a Patent?

- **About:**
  - A Patent is a **statutory right for an invention granted for a limited period to the patentee** by the Government, in exchange of **full disclosure of his invention** for excluding others, from making, using, selling, importing the patented product or process for producing that product for those purposes without his consent.
  - The patent system in India is governed by the **Patents Act, 1970** which was amended in 2003 and 2005.
  - The Patent Rules are regularly amended in consonance with the changing **environment, the most recent being** Patents (Amendment) Rules, 2024.
- **Term of a Patent:**
  - The term of every patent granted is 20 years from the date of filing of the application.
  - However, for applications filed under the national phase of the **Patent Cooperation Treaty (PCT),** the accorded term will be 20 years from the international filing date.
    - PCT is an international treaty with more than 150 contracting states, making it possible to seek **patent protection for an invention simultaneously in each of a large number of countries** by filing an international patent application.
    - Such an application may be filed by anyone who is a national or resident of a PCT contracting State, and generally be filed with the national patent office of the contracting State with the International Bureau of World Intellectual Property Organisation (WIPO) in Geneva.

Note:

Intellectual Property	Protection	Law in India	Duration
Copyright	Expression of Ideas	Copyright Act 1957	Variable
Patent	Inventions- New Processes, Machines, etc.	Indian Patent Act 1970	20 years Generally
Trademarks	Sign to distinguish business goods or services	Trade Marks Act 1999	Can last Indefinitely
Trade Secrets	Confidential Business Information	Protected without Registration	Unlimited time
Geographical Indication (GI)	Sign used on specific geographical origin and possess qualities due to site of origin	Geographical Indication s of Goods(R & P) Act, 1999	10 years (Renewable)
Industrial Design	Ornamental or aesthetic aspect of an article	Design Act, 2000	10 years

Delhi Excise Policy Case

Why in News?

Recently, a Magistrate Court in Delhi has sent the Chief Minister of Delhi to the **Enforcement Directorate's (ED's)** custody in connection with the Excise Policy Case.

- The CM of Delhi is accused by the ED of being the "kingpin and key conspirator" of the Delhi excise scam.

What is the Delhi Excise Policy Case?

- **About:**
  - The **Delhi Excise Policy Case** refers to a **case surrounding the formulation** and implementation of the **Delhi Excise Policy 2021-22.**
  - This policy, which came into effect in November 2021, was **subsequently scrapped in July 2022** due to allegations of procedural lapses, corruption, and financial losses to the exchequer.
- **Key Allegations:**
  - **Arbitrary Decisions:** The Delhi Chief Secretary's report highlighted arbitrary and unilateral decisions made by Delhi's Deputy Chief Minister and Excise Minister, which allegedly led to **financial losses estimated at over Rs 580 crore.**
  - **Conspiracy and Kickbacks:** The Enforcement Directorate (ED) has alleged that the new excise policy was implemented as part of a **conspiracy to provide a 12% profit margin to certain private companies** in the alcohol business.
    - It's alleged that a **6% kickback was involved in this arrangement.**

Note:

- A **Kickback** refers to a form of **bribery or corrupt payment made to someone**, typically a public official or businessperson, in return for facilitating or influencing a transaction or decision in favour of the person providing the kickback.

❍ **Cartel Formation and Preferential Treatment:** The ED alleges that the policy was designed with deliberate loopholes to promote cartel formations and benefit **leaders of the Aam Aadmi Party (AAP).**

- **Preferential treatment,** such as discounts, extensions in license fees, waiver of penalties, and relief due to disruptions caused by the **Covid-19 pandemic,** were granted to alcohol business owners and operators in exchange for kickbacks.

❍ **Influence on Elections:** It's alleged that the kickbacks received through this scheme were used to influence **Assembly elections in Punjab and Goa** in early 2022.

The New Delhi Excise Policy 2021-22, which sought to ensure optimum revenue for the State government and confront the sale of spurious or bootlegged liquor ran widespread allegations of "procedural lapses,". This has forced the government to scrap it with effect from August 1, 2022

Under the new policy, the number of liquor vends in Delhi would have increased from around 630 to 850 — all privately owned and operated. One person could hold more than one liquor retail licence and the "heavily regulated" excise regime was to be eased for business.

The revamped excise policy ran into controversy as private liquor vends were opening up across the capital. Many of these vends were sealed by the MCD for various violations related to non-conforming areas where certain businesses such as liquor retail are not allowed.

Can an Incumbent Chief Minister Govern the State/UT Administration from Jail?

➢ **Constitutional Morality and Good Governance:**

❍ The Indian Constitution doesn't explicitly address the issue of whether a Chief Minister (CM) can run the government from jail.

❍ However, judgments by various courts have emphasised the importance of **constitutional morality, good governance, and public trust** in holding public office.

➢ **CM Not Immune as President or Governor:**

❍ President of India and Governors of states are the only constitutional **post holders who are immune from civil and criminal proceedings** until his/her term ends, as per the law.

❍ **Article 361 of the Constitution** says that the President of India and Governors of states are not answerable to any court of law for "any act done in discharge of their official duties".

- The **Administrator or Lt. Governor (LG) of a Union Territory is not immune under Article 361**, unlike the Governor and President who have immunity.

❍ But the immunity doesn't cover the **Prime Ministers or Chief Ministers** who are treated as equals in front of the Constitution that advocates the **Right to Equality before the law.**

- Yet, they are not disqualified just by an arrest.

➢ **Legal Framework:**

❍ As per the law, a Chief Minister can only be disqualified or removed from office when he is **convicted in any case.**

- In the case of Arvind Kejriwal, **he has not been convicted yet**.

❍ The **Representation of the People Act, 1951** has disqualification provisions for certain offences but a **conviction of anyone holding the office is mandatory.**

Note:

- The Chief Minister can lose the top job under only two conditions - **loss of majority support in the assembly** or through a **successful No-Confidence Motion against the government** in power that the Chief Minister leads.

➢ **Basic Norms for Holding Public Office:**
- ❍ As mentioned by the Supreme Court in ***Manoj Narula versus Union of India Case, 2014***, the basic norms for holding a public office include **constitutional morality, good governance, and constitutional trust.**
- ❍ Public officials are expected to **act in a manner consistent with these principles**.
  - Court has recognised that citizens expect persons in power to uphold high standards of moral conduct.
  - This expectation is particularly high for positions like Chief Minister, which are seen as the repository of public faith.

➢ **Practical Difficulties of Functioning from Jail:**
- ❍ The practical challenges of a Chief Minister running the government from jail are significant.
  - For example, they may **face restrictions on accessing official documents or communicating with government officials.**
  - There may also be questions about whether they can effectively fulfill their duties while in custody.

➢ **Precedents and Case Law:**
- ❍ In ***S. Ramachandran versus V. Senthil Balaji Case, 2023,*** the Madras High Court considered whether a Minister accused of a financial scandal had forfeited their right to hold office.
- ❍ The Madras HC judgment highlighted the practical difficulties of being a Minister while in custody.
  - Even if it's technically possible for a Chief Minister to run the government from jail, there may be concerns about the **legitimacy and effectiveness of their leadership under such circumstances.**
- ❍ The High Court raised a question, **whether an individual should receive a salary** from the public exchequer while occupying a public office **without performing any associated duties.**

➢ **President's Rule:**
- ❍ Since it is impractical for any CM to run a government from the jail, the Lt. Governor can cite **'failure of constitutional machinery in the state,'** a strong reason for the **President's rule in Delhi under Article 239AB** of the Constitution and pave the way for the CM to resign.
  - The President's rule will bring that national capital under the Union government's direct control.

What is the ED?

➢ **About:**
- ❍ The ED is a multi-disciplinary organisation mandated with investigation of **offences of money laundering** and violations of foreign exchange laws.
  - It functions under the **Department of Revenue of the Ministry of Finance.**
- ❍ As a premier financial investigation agency of the Government of India, the ED functions in strict compliance with the Constitution and Laws of India.

➢ **Structure:**
- ❍ **Headquarters:** ED with its headquarters at New Delhi, is headed by the Director of Enforcement.
  - There are five regional offices at Mumbai, Chennai, Chandigarh, Kolkata and Delhi headed by Special Directors of Enforcement.
- ❍ **Recruitment:** Recruitment of the officers is done directly and by drawing officers from other investigation agencies.
  - It comprises officers of IRS (Indian Revenue Services), IPS (Indian Police Services) and IAS (Indian Administrative Services) such as Income Tax officer, Excise officer, Customs officer, and police.
- ❍ **Tenure:** Two years, but directors' tenure can be **extended from two to five years by giving three annual extensions.**
  - The **Delhi Special Police Establishment (DSPE) Act, 1946 (for ED) and the Central Vigilance Commission (CVC) Act, 2003** (for **CV Commissioners**) have been amended to give the government the power to keep the two chiefs in their posts for one year after they have completed their two-year terms.

➢ **Functions:**
- ❍ **COFEPOSA:** Under the **Conservation of Foreign Exchange and Prevention of Smuggling Activities Act, 1974 (COFEPOSA)**, Directorate is empowered to sponsor cases of **preventive detention** with regard to contraventions of FEMA.
- ❍ **Foreign Exchange Management Act, 1999 (FEMA):** It is a civil law enacted to consolidate and amend the laws relating to **facilitate external trade and payments** and to promote the orderly development and maintenance of foreign exchange market in India.

Note:

- ED has been given the responsibility to **conduct investigation into suspected contraventions of foreign exchange laws** and regulations, to adjudicate and impose penalties on those adjudged to have contravened the law.

❍ **Prevention of Money Laundering Act, 2002 (PMLA):** Following the recommendations of the **Financial Action Task Force (FATF)** India enacted PMLA.

- The ED has been entrusted with the responsibility of executing the provisions of PMLA by conducting investigation **to trace the assets derived from proceeds of crime,** to provisionally attach the property and to ensure prosecution of the offenders and confiscation of the property by the Special court.

❍ **Fugitive Economic Offenders Act, 2018 (FEOA):** With the increase in the number of cases relating to economic offenders taking shelter in foreign countries, the Government of India introduced the **Fugitive Economic Offenders Act, 2018 (FEOA)** and ED is entrusted with its enforcement.

- This law was enacted **to deter economic offenders from evading the process of Indian law** by remaining outside the jurisdiction of Indian courts.
- Under this law, the **ED is mandated to attach the properties of the fugitive economic offenders** who have escaped from India warranting arrest and provide for the confiscation of their properties to the Central Government.

Criminal Case Management System and Sankalan App

Why in News?

In a significant move to enhance India's capability in **combating terrorism** **and** **organized crime**, the Ministry of Home Affairs inaugurated a digital **Criminal Case Management System (CCMS)** developed by the **National Investigation Agency (NIA)** in New Delhi.

➢ Alongside the CCMS, a mobile app **'Sankalan',** a compendium of **New Criminal Laws** by the **National Crime Records Bureau (NCRB)** was also launched.

What is the Criminal Case Management System (CCMS)?

➢ The CCMS is an innovative digital platform that streamlines and enhances the **management of criminal cases,** particularly those related to terrorism and organised crime.

❍ The CCMS software aims to standardise investigations and compile terror-related data across India.

➢ CCMS serves as a **user-friendly and customizable browser-based software** designed to facilitate coordination among law enforcement agencies, improve the efficiency of investigations, and enhance justice delivery.

➢ This system enables the **integration, organisation, and digitalisation** of data generated during investigations, providing a comprehensive tool for investigators, prosecutors, and other stakeholders involved in the criminal justice process.

➢ CCMS fosters stronger cooperation between central and state agencies, facilitating seamless information sharing.

Sankalan App

➢ The Sankalan app has been designed to **navigate through new criminal laws as a bridge between old and new criminal laws.**

➢ This app will work as a comprehensive guide for all stakeholders. The app will work in offline mode as well and its availability has been ensured in far-flung areas so that all stakeholders can have access to desired information around the clock.

What is the National Investigation Agency (NIA)?

➢ **About:**

❍ The NIA is a **federal agency** established by the Indian government to investigate and prosecute crimes related to terrorism, insurgency, and national security matters.

❍ It was formed in **2009 following the Mumbai terrorist attacks,** operating under the **National Investigation Agency (NIA) Act, 2008**, and falls under the jurisdiction of the **Ministry of Home Affairs.**

❍ The **NIA (Amendment) Act 2019** allows the NIA to investigate crimes **committed outside India,** following international treaties and laws.

- The NIA can now investigate additional offences such as human trafficking, cyber-terrorism, and crimes under various acts.

❍ At present NIA is functioning as the **Central Counter Terrorism Law Enforcement Agency in India.**

➢ **Headquarters:** Delhi.

➢ **Functions:**

❍ Collects, analyses, and disseminates intelligence related to terrorism and national security.

Note:

- Coordinates with law enforcement agencies nationally and internationally in matters of terrorism and national security.
- Conducts capacity-building programs for law enforcement agencies and other stakeholders.

New Electric Vehicle Policy 2024

Why in News?

In a significant development, the Government of India has greenlit a strategic policy aimed at **positioning India as a prime manufacturing hub for electronic vehicles (e-vehicles).**

- This initiative is not only geared towards bolstering the nation's technological prowess but also aligns with the overarching goal of fortifying the **'Make in India' campaign.**

What is the Centre's New Electric Vehicle Policy?

- **Highlights of the Policy:**
  - **Duty Reduction for EV Imports:**
    - The policy slashes **customs duty rate to 15%** (applicable to Completely Knocked Down - CKD units) will be imposed on EVs with a minimum CIF (Cost, Insurance, and Freight) value of USD 35,000 or above for a total period of 5 years.
  - **Import Cap and Investment Prerequisites:**
    - While allowing reduced-duty imports, the policy **caps the number of imported EVs at 8,000 per year.**
    - Manufacturers must invest a minimum of Rs 4,150 crore (~USD 500 Mn) to avail duty concessions.
      - There's no ceiling on the maximum investment, incentivising substantial capital infusion into the sector.
  - **Manufacturing and Value Addition Requirements:**
    - To promote local manufacturing, companies must set up operational facilities **within 3 years** and achieve a **minimum domestic value addition (DVA) of 25% within the same period**, escalating to **50% within 5 years** from the date of issuance of approval letter by the **Ministry of Heavy Industries.**
      - DVA is a percentage share of value that represents the value an economy adds to goods and services produced for export.
  - **Maximum Import Allowance:**
    - If the investment exceeds USD 800 Mn, up to 40,000 EVs can be imported, not exceeding 8,000 per year.
      - Companies can carry over any unused annual import limits.
  - **Duty Limit:**
    - The total duty waived on imported EVs will be capped at the investment made or Rs 6484 Cr (equal to incentive under the **Production Linked Incentive (PLI) scheme for Automobile and Auto Components)**, whichever is lower.
  - **Bank Guarantees:**
    - The bank guarantee will only be returned upon achieving 50% DVA and making an investment of at least Rs 4,150 crore or to the extent of duty foregone in 5 years, whichever is higher.
- **Key Benefits:**
  - The policy stimulates innovation and progress in electric vehicle technology.
  - It promotes indigenous manufacturing, aligning with the government's **Make in India campaign.**
  - By promoting EV adoption, the policy helps reduce crude oil imports and narrows the trade deficit.
  - The shift to electric vehicles contributes to mitigating air pollution, particularly in urban areas.
    - The new **EV policy aligns with India's climate goals** of reducing emissions intensity by **45% by 2030** and achieving **net-zero emissions by 2070.**
  - Positive Impact on Health and Environment.
- **Impact:**
  - The policy aims to attract global players like Tesla by offering investment incentives and import duty reductions.
    - Global EV manufacturers, including Tesla, Inc., had been advocating for **tariff concessions as a prerequisite** for establishing manufacturing plants in India.
    - The new policy effectively fulfils this demand, signalling India's commitment to attracting foreign investment in the EV sector.
  - With **India currently being the world's third-largest automobile market** and one of the fastest-growing, the EV sector is poised to emerge as a major category within the automotive industry.
    - The automotive sector's substantial contribution to **India's GDP underscores its strategic importance.**

Note:

The EV market in India

- The Indian EV market is witnessing rapid growth, with EV sales surging by **over 45% in 2024** despite regulatory changes.
- Total EV registrations surpassed **1.5 million units by the end of 2023,** a significant increase from just over 1 million in the previous year.
- The growth in EV registrations has elevated **India's overall EV market penetration to 6.3%,** indicating significant progress in EV adoption.
- Indian automakers are making substantial investments in electrification, encouraged by the government's plan to eventually phase out subsidies.

What are the Other Initiatives Related to Electric Vehicles in India?

- **Electric Mobility Promotion Scheme (EMPS) 2024:**
  - The Indian government has introduced the EMPS 2024 to promote the purchase of **electric two-wheelers (e2W) and three-wheelers (e3W).** With a budget of Rs 5 billion, it will **replace the FAME-2 scheme** and will be effective from April to July 2024, with the possibility of being replaced or extended thereafter.
    - The main goal is to **increase the adoption of e2Ws and e3Ws** while gradually reducing industry reliance on subsidies.
      - The subsidy is now reduced to Rs 5,000 per kilowatt-hour of battery capacity, down from Rs 10,000, and capped at Rs 10,000 per e-2W, which is a reduction of 15% from the price under FAME-II and is expected to cover 3,33,387 e-2Ws.
    - The scheme **does not cover electric four-wheelers (e4Ws)** and e-buses.
- **Phased Manufacturing Programme (PMP):**
  - The Ministry of Heavy Industries has introduced a PMP **to promote indigenous manufacturing of Electric Vehicles** and their components over time.
  - A graded duty structure is envisioned to incentivise local manufacturing.
- **National Mission on Transformative Mobility and Storage:**
  - The aim of the mission is to drive strategies for transformative mobility and Phased Manufacturing Programmes for **electric vehicles, electric vehicle Components and Batteries.**
- **EV30@30 campaign**:
  - India is among a handful of countries that support the **global EV30@30 campaign,** which aims for at **least 30% of new vehicle sales to be electric by 2030.**
- **Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME) – I and II.**
- **Production Linked Incentive (PLI) scheme for Automobile and Auto Components.**
- **National Electric Mobility Mission Plan (NEMMP).**

What are the Challenges for the EV market in India?

- **Charging Infrastructure:**
  - **Limited Availability:**
    - There aren't enough charging stations, especially outside major cities.
    - This creates a lack of accessibility and makes **long-distance travel impractical for many EV owners.**
  - **High Installation and Maintenance Costs:**
    - Setting up charging stations requires significant investment, and maintaining them adds to the operational cost.
    - This can limit the number of operators willing to invest, hindering infrastructure growth.
  - **Range Anxiety and Long Charging Times:**
    - The limited availability of charging stations, coupled with the relatively **short driving range of EVs compared to gasoline vehicles,** creates anxiety for potential buyers. Filling a gas tank is quick while charging an EV can take hours.
- **Cost:**
  - **High Upfront Cost of EVs:**
    - Electric vehicles themselves are **more expensive than comparable gasoline models**, due to battery and technology costs. This is a major hurdle for budget-conscious Indian consumers.
  - **High Battery Costs:**
    - Battery technology is still evolving, and **production costs remain high.** This significantly impacts the overall price of EVs.
- **Customer Support and Awareness:**
  - **Lack of Service Options:**
    - The service network for EVs is still developing. **Finding trained technicians and service centres** equipped for EVs can be challenging for some owners.
  - **Lack of Consumer Awareness:**
    - Some potential EV buyers may not be familiar with the benefits of electric vehicles, or they may have **misconceptions about them.**

Note:

- This can make it difficult to convince them to switch from gasoline.

➢ **Supply Chain and Policy:**
  - **Supply Chain Challenges:**
    - India relies on **imports for critical EV components** like lithium and cobalt. Disruptions in the global supply chain can affect EV production and costs.
  - **Policy Uncertainty:**
    - Government policies and regulations are not constant. This can make it difficult for automakers and consumers to plan for the future.
    - However, recent initiatives like EMPS aim to provide some stability and incentivize EV adoption, though the long-term impact remains to be seen.
  - **Subsidy Dependence:**
    - While initiatives like EMPS 2024 can help reduce the upfront cost of EVs, **over-reliance on subsidies can create uncertainty in the market** if they are reduced or phased out in the future.

➢ **Other Challenges:**
  - **Uncertain Consumer Behaviour:** The long-term economic and environmental benefits of EVs are clear, but it's **uncertain how quickly consumers will adopt this new technology.**
  - **Lack of Standardisation:** The lack of standardised charging protocols can create confusion for consumers and limit interoperability between different EV models and charging stations.

S. R. Bommai v. Union of India Case 1994

Why in News?

The **S. R. Bommai v. Union of India case,** decided by a nine-judge bench of the **Supreme Court of India** in 1994, restricts the **arbitrary dismissal of state governments under Article 356.** Celebrating its 30th anniversary, its impact persists in shaping India's constitutional framework.

What is the S. R. Bommai v. Union of India case?

➢ **Background of S. R. Bommai v. Union of India:**
  - In 1985, the Janata Party won the Assembly elections in Karnataka and formed the government with Chief Minister Ramakrishna Hegde. Hegde was later replaced by SR Bommai in 1988.
    - In September 1988 a legislator from the Janata Dal, **defected from the party along with 19 other members** of the Legislative Assembly, withdrawing support from the Bommai government.
  - The **state government was dismissed by using Article 356** due to majority loss from defections. Bommai's request to test the majority was denied by the **governor.**
  - Bommai sought relief in the high court, which ruled against him, leading to an appeal to the Supreme Court.

➢ **Supreme Court Judgment:**
  - A nine-judge bench of the Supreme Court emphasised that the **Presidential Proclamation under Article 356** must be exercised with caution, as advocated by **Dr. B.R. Ambedkar** and recommended by the **Sarkaria Commission.**
  - Both houses of Parliament must thoroughly analyse the Presidential Proclamation as per **Article 356(3).**
    - If the proclamation is issued without the approval of both houses, it **lapses within two months,** and the state assembly resumes its function.
  - The Supreme Court can subject the proclamation to **judicial review** and entertain **writ petitions** challenging its legality if they raise arguable questions.
  - Clarified that the **President's power to dismiss a state government is not absolute** but subject to limitations.
    - Recognised that while **Article 356 does not explicitly address the dissolution of the legislature,** such powers can be inferred from it.
    - Noted that **Article 174(2),** allowing the Governor to dissolve the Legislative Assembly, and **Article 356(1)(a), enabling the President to confer upon himself the powers of the Governor** and the state government, imply the power to dissolve the legislature.

➢ **Significance of S.R. Bommai v. Union of India Case:**
  - The S.R. Bommai case gives one of the landmark judgment of the Supreme Court regarding the **basic structure doctrine** as well as recording **the misuse of article 356.**
  - The judgement **provided clarity on the scope and limitations of Article 356**, emphasising its use only in extraordinary circumstances.

Note:

- The principles laid down by the Supreme Court were consistent with the recommendations of the **Sarkaria Commission.**
- The case affirmed the **principles of federalism,** stating that state governments are not subordinate to the centre and advocating for cooperative federalism.
- The judgement asserted the **role of the judiciary in scrutinising the President's actions under Article 356,** ensuring adherence to constitutional principles and preventing misuse of power.
- It affirmed that the **floor of the Assembly is the sole authority** to test the government's majority, not the subjective opinion of the Governor.

Note:

- The Sarkaria Commission advocated for notifying the **state before activating Article 356(1)** under certain instances.
  - It stated that **all other options should be first considered to solve the problem** and **Article 365 should only be used if there is no other option available** that can be implemented to solve the problem at hand.
- Cooperative federalism and Competitive federalism:
  - In **Cooperative federalism the Centre and states share a horizontal relationship,** where they "cooperate" in the larger public interest.
    - It is an important tool to enable states' participation in the formulation and implementation of national policies.
    - The Union and the states are **constitutionally obliged to cooperate with each other** on the matters specified in Schedule VII of the Constitution.
  - In **Competitive federalism the relationship between the Central and state governments is vertical** and between state governments is horizontal.
    - In **Competitive federalism States need to compete among themselves** and also with the Centre for benefits.
    - States compete with each other to attract funds and investment, which facilitates efficiency in administration and enhances developmental activities.

What is Article 356 of the Indian Constitution?

- **Background of Article 356:**
  - Initial discussions in the Constituent Assembly deliberated on whether India should adopt a federal or unitary system of government.
    - Two schools of thought emerged, with proponents of federalism arguing for decentralised powers and others advocating for a more centralised unitary state.
  - Dr. Ambedkar clarified that **India operates under both federal and unitary principles**, with federalism prevailing under normal circumstances and unitary control during emergencies.
    - Despite warnings against misuse, subsequent governments frequently employed Article 356 for political reasons, resulting **in its invocation 132 times.**
- **Article 356:**
  - Article 356 of the Constitution of India is based on **Section 93 of the Government of India Act, 1935.**
  - According to Article 356, the President's Rule can be imposed on any state of India on the grounds of the **failure of the constitutional machinery.**
  - President's Rule can be imposed in **two situations:** when the President receives a report from the **state's Governor** or is otherwise convinced that the **state government cannot function according to the Constitution (Article 356)**, and when a state fails to comply with directions from the Union government (**Article 365**).
  - During the President's Rule, the **state government is suspended,** and the central government directly administers the state through the Governor.
  - **Parliamentary approval is necessary** for imposing the President's Rule, and it should be approved in both Houses of Parliament within two months through a **simple majority.**
  - Initially, the President's Rule is for six months and can be **extended for up to three years** with **parliamentary approval every six months.**
  - The **44th Amendment to the Constitution (1978)** introduced constraints on extending the President's Rule beyond one year, allowing extension only in **case of a national emergency** or if the **Election Commission** certifies the necessity due to difficulties in conducting state assembly elections.

Note:

- Based on the **report of the Sarkaria Commission** on Centre-state Relations (1988), the **Supreme Court in the *Bommai case, 1994*,** enlisted the situations where the **exercise of power under Article 356 could be proper or improper.**

Proper Use of Article 356	Improper Use of Article 356
Hung Assembly: No party secures a majority after elections.	The Ministry resigns without exploring alternative ministry formation.
The majority party **declines to form a ministry**, and no coalition ministry with a majority is available.	Governor imposes President's Rule **without allowing majority test.**
The Ministry resigns after defeat in the assembly, and **no party can form a new ministry with a majority.**	The ruling party suffers a significant defeat in the Lok Sabha elections.
Internal subversion or deliberate **violation of the Constitution.**	Internal disturbances not amount to subversion or breakdown.
The state government disregards the **constitutional direction** of the Central government.	**Allegations** of maladministration or corruption without proper warning.
Physical breakdown, **endangering state security.**	Misuse for intraparty issues or irrelevant purposes.
	The state government is **not given prior warning, except in emergencies.**

Merging Cantonments with the State Municipalities

Why in News?

Recently, the Centre has issued a notification to denotify civil areas of **10 cantonments (out of 58) in the country.** These areas will be merged with the Concerned **State Municipalities (Local Bodies).**

- The government plans to exclude certain areas of the said cantonments and merge such areas with the state's local bodies.

What are Cantonments?

- Cantonments are areas primarily designated for **housing military personnel and supporting infrastructure.**
  - Originating from the French word "**canton," meaning "corner" or "district**," cantonments historically referred to **temporary military encampments.**
  - However, over time, they have evolved into **semi-permanent settlements that provide accommodation**, offices, schools, and other facilities for military personnel and their families.
- In India, the history of cantonments dates back to the **British East India Company period.** The first cantonment was established in **1765 at Barrackpore, near Calcutta, following the Battle of Plassey in 1757**.
  - These areas were initially created to station military troops but have expanded to include civilian populations that provide support and logistic services to the military.
- **The Cantonments Act of 1924** in India formalised the governance and administration of cantonments, providing a legal framework for their management, development, and regulation.

What is the Mechanism for Cantonment Administrations in India?

- **Cantonments and their structure:**
  - Cantonments are classified into four categories — **class I to class IV** —depending on the size of the area and population.
  - While a **class I cantonment has eight elected civilians** and eight government/military members on the board, a **class IV cantonment has two elected civilians** and two government/military members.
  - This board is responsible for various aspects of the cantonment's administration.
    - The station commander of the cantonment is the ex-officio president of the board, and an officer of the Defence Estates Organisation is the chief executive and the member-secretary.
    - The board has equal representation of elected and nominated/ex-officio members to balance the official representation.
- **Administrative Control:**
  - An inter-services organisation of the Ministry of Defence **directly controls cantonment administration.**

Note:

- In terms of **Entry 3 of the Union List (Schedule VII) of the Constitution** of India, **Urban Self Governance of the Cantonments** and the Housing Accommodation therein is the **subject matter of the Union of India.**
- There are approximately 62 Cantonments in the country that have been notified under the Cantonments Act, 1924 (succeeded by the Cantonments Act, 2006).

➢ **Administrative structure and regulation of the Urban Governance by the Municipalities:**

- **At the Central level:** The subject of 'urban local government' is dealt with by the following three ministries:
  - Ministry of Housing and Urban Affairs.
  - Ministry of Defence in the **case of cantonment boards**
  - Ministry of Home Affairs in **the case of Union Territories.**
- **At State Level:**
  - Urban governance is part of the state list under the Constitution. Thus, the administrative framework and regulation of ULBs varies across states.
  - The **Constitution (74th Amendment) Act, 1992** provided for the establishment of **Urban Local Bodies (ULBs)** (including municipal corporations) as institutions of local self-government.
    - It also empowered state governments to devolve certain functions, authority, and power to collect revenue from these bodies and made periodic elections for them compulsory.

What is the Need for Merging Cantonments with the Municipalities?

➢ **DIfferent Restrictions:**

- Civilians living in cantonment areas **have long complained of issues** regarding different **restrictions** and said cantonment **boards have failed to resolve them.**
- For example, **access to home loans, and free movement within the premises.**

➢ **Local Governance and Civic Amenities:**

- The integration of civilian areas into municipal governance can lead to **improved civic amenities** and infrastructural development.
- Residents may have a more significant say in local governance matters, resulting in better urban planning and public services.

What are the Issues in Merging Cantonments with the Municipalities?

➢ **Legal and Administrative Challenges:**

- The transition from a cantonment town to a **merged municipality may bring about various legal and administrative challenges** like integrating infrastructure systems such as **roads, water supply, sewage, and electricity** between the cantonment and civilian areas.

➢ **Resistance from Existing Constituencies:**

- City councillors and political representatives **may resist allocating funds from their constituencies** to support the newly merged areas.
- This resistance could further exacerbate inequalities within the city and impede efforts to improve services and infrastructure in the merged areas.

➢ **Infrastructure Strain:**

- The sudden inclusion of cantonment areas into ULBs may strain existing infrastructure such as water supply, sewage systems, transportation networks, and healthcare facilities.
- ULBs may struggle to upgrade and expand infrastructure to meet the needs of the merged areas, leading to service **disruptions and deteriorating living conditions.**

➢ **Environmental Concerns:**

- Uncontrolled construction and commercialisation in merged areas, especially in ecologically sensitive regions like hill stations, could have **detrimental effects on the environment and local ecosystems**.
- Poorly regulated development may lead to issues such as deforestation, soil erosion, and increased vulnerability to natural disasters like landslides and floods.

➢ **Security Considerations:**

- The proximity of civilian areas to military installations raises security concerns, particularly regarding **unauthorised construction and encroachment near defence facilities.**
- ULBs must adhere to security guidelines and regulations set by the military to ensure the safety and security of military personnel and assets.

Note:

India's Urbanization

KEY CHALLENGES

Urbanization is creating new employment opportunities, but not everyone benefits

Risks from disasters and economic shocks are a major issue in Myanmar's cities especially for the urban poor

Inequality in cities is evident and can create social tension given the density

The needs for sustainable infrastructure and spatial planning in urban areas are massive

Several vulnerable groups in urban areas such as ethnic minorities, migrants, the urban poor, women, and the disabled are marginalized

Conditions in informal settlements are especially poor, these areas are in greatest need for water, sanitation, solid waste management and transport services

POLICY RECOMMENDATIONS

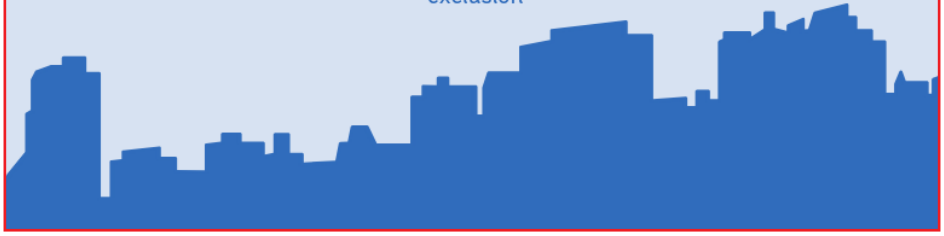
Implementation will be reliant on a strong commitment from the government to a bold reform agenda

Invest in sustainable urban infrastructure and urban upgrading

Build resilience to mitigate the impact of shocks on people's livelihoods and health

Facilitate access to legal documentation for migrants and specific subgroups, and targeted social programs for those particularly vulnerable to exclusion

Invest in capacity building and new financing for urban development



Note:

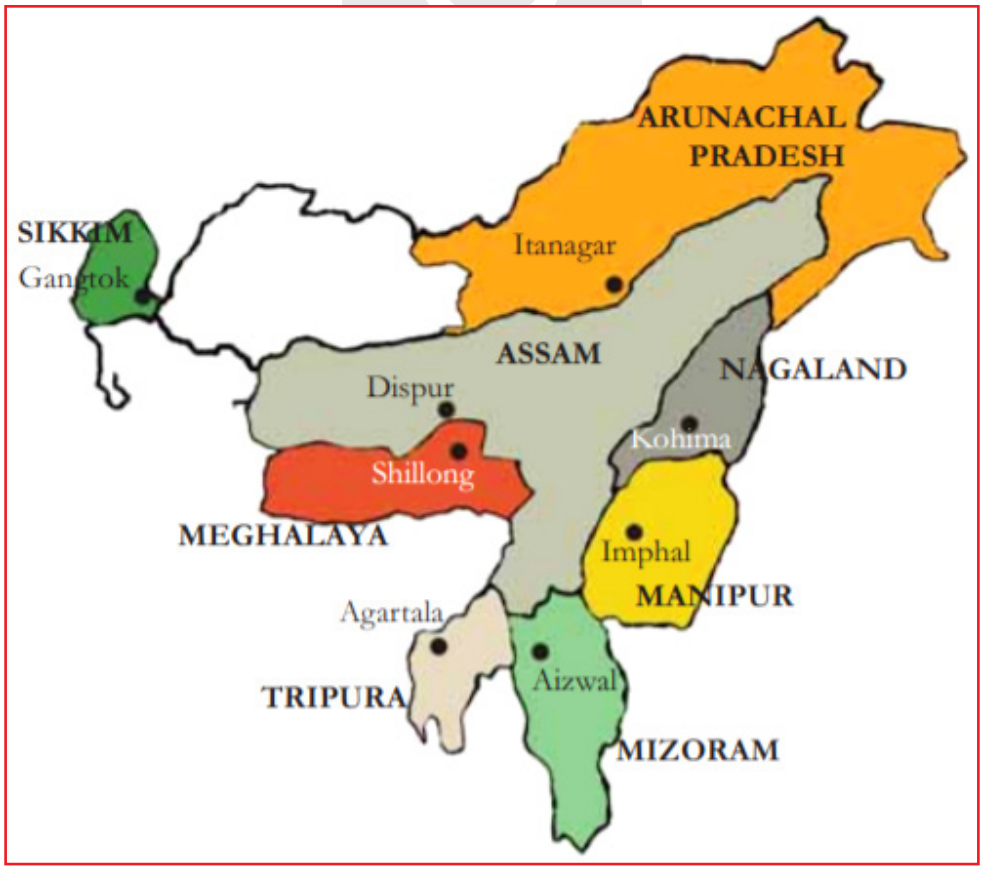
UNNATI 2024

Why in News?

The Union Cabinet has approved the **Uttar Poorva Transformative Industrialization Scheme (UNNATI), 2024** to foster industrial growth and employment generation in the **northeastern region.**

What is UNNATI 2024?

- **Objective:**
  - It is aimed at **developing industries and generating employment** in the Northeast region.
  - It focuses on **attracting new investments,** nurturing existing ones, and promoting industries like **renewable energy and Electric Vehicle charging stations** while restricting environmentally harmful sectors such as cement and plastic.
- **Salient Features:**
  - **Scheme Period:** Effective from the date of Notification until 31.03.2034, with 8 years of committed liabilities.
    - The scheme's total cost is **Rs. 10,037 crore**, covering a 10-year period with an additional 8 years for committed liabilities.
  - **Commencement of Production:** All eligible Industrial Units to commence their production or operation within **4 years** from the grant of registration.
  - **Zone Classification**: Districts are categorised into **Zone A (Industrially Advanced)** and **Zone B (Industrially Backward)** for incentives.
  - **Funds Allocation:** 60% of Part A outlay earmarked for 8 North Eastern states and 40% allocated on a First-In-First-Out (FIFO) basis.
- **Incentives for Investors:** The scheme offers various incentives to investors for setting up new units or expanding existing ones, categorised based on **GST** applicability, like:
  - **Capital Investment Incentive**
  - **Central Capital Interest Subvention**
  - Manufacturing & Services linked incentive (MSLI) for new units linked to Net Payment of GST, with upper limits based on zones.
- **Implementation Strategy: The Department for Promotion of Industry and Internal Trade (DPIIT)** will implement the scheme in collaboration with states, overseen by national and state-level committees.



Note:

What are the Other Government Initiatives Related to the North Eastern Region?

- **Prime Minister's Development Initiative for North East Region (PM-DevINE) Scheme:** Launched in the Union Budget 2022-2023 and approved by the Union Cabinet in October 2022, PM-DevINE aims to fund infrastructure and social development projects in the NorthEast Region (NER).
- **Advancing North East Portal:** It is a digital platform and web-based initiative developed by NEC through **the North Eastern Development Finance Corporation (NEDFi)** which provides much-needed knowledge and guidance for the youth of NER.
- **North East Special Infrastructure Development Scheme (NESIDS):** NESIDS, a central sector scheme with **100% central funding**, receives a renewed approved outlay of Rs. 8139.50 crore for 2022-23 to 2025-26.
  - The scheme encompasses two components: **NESIDS-Road and NESIDS-Other Than Road Infrastructure (OTRI).**
- North East has been kept as a priority area under **RCS-UDAN** (to make flying more affordable).

PM-SURAJ and NAMASTE Scheme

Why in News?

The Ministry of Social Justice and Empowerment launched the '**Pradhan Mantri Samajik Utthan and Rozgar Adharit Jankalyan' (PM-SURAJ) national portal online** aimed at offering credit support to the marginalized segments of society, with the Prime Minister as the Chief Guest.

- The PM distributed **Ayushman Health Cards** and **Personal Protective Equipment to Safai Mitras(sewer and septic tank workers)**, under the **National Action for Mechanised Sanitation Ecosystem (NAMASTE) scheme,** which was previously a rehabilitation scheme for **manual scavengers.**

What is PM-SURAJ?

- The 'PM-SURAJ' national portal aims to uplift the **most marginalized sections** of society and provide credit assistance to one lakh entrepreneurs from disadvantaged communities.
  - It is implemented by the **Ministry of Social Justice and Empowerment** and its departments.
- The portal serves as a **one-stop point where people from disadvantaged sections** of society can apply for and monitor the progress of all loan and credit schemes already available to them.
- The credit support will be facilitated through banks, **Non-Banking Financial Companies Finance Institutions (NBFC-MFIs),** and other organizations, ensuring accessibility across the country.
  - An NBFC MFI is a **non-deposit taking NBFC** with a minimum Net Owned Funds (NOF) of Rs. 5 crore (Rs. 2 crore for those registered in the North Eastern Region of the country) and having at least 85% of its net assets as "qualifying assets (intended use or sale)".

What is the NAMASTE Scheme?

- **About:**
  - The NAMASTE Scheme is a **central Sector Scheme** formulated in 2022, by the **Ministry of Social Justice and Empowerment (MoSJE)** and the **Ministry of Housing and Urban Affairs (MoHUA).**
    - It aims to ensure **safety, dignity, and sustainable livelihoods** for urban sanitation workers.
  - The **Self-Employment Scheme for Rehabilitation of Manual Scavengers (SRMS)** has been renamed as the NAMASTE.
    - The SRMS scheme was launched in 2007 to help rehabilitate manual scavengers and their dependents.
  - The NAMASTE scheme is to be implemented over **4800 Urban Local Bodies (ULBs)** of the country, during the next three years i.e. up to 2025-26.
    - The **National Safai Karamchari Financial Development Corporation (NSKFDC)** is the implementing agency for NAMASTE.
- **Objectives:**
  - Rehabilitation of **Manual Scavengers (MS)** and Persons Engaged in Hazardous Cleaning of Sewer and Septic tanks (SSWs).
  - Promotion of safe and mechanised cleaning of sewers and septic tanks through trained and certified sanitation workers.
- **Intended Outcomes:**
  - **Zero fatalities** in sanitation work in India.
  - All sanitation work is performed by formalized **skilled workers.**
  - No sanitation workers come in **direct contact with human faecal matter.**

Note:

- Sanitation workers are collectivised into **Self Help Groups (SHGs)** and are empowered to run sanitation enterprises.
- Sewers and SSWs and their **dependents also have access to livelihoods** by providing capital subsidies for purchase of sanitation-related equipment.
- Increased awareness amongst sanitation services seekers (individuals and institutions) to seek services from registered skilled & certified sanitation workers
- Extending Health Insurance Scheme benefits under **Ayushman Bharat, Pradhan Mantri Jan Arogya Yojana (PM-JAY)** to SSW & manual scavengers and their family members.

What are India's Other Credit Schemes to Empower Marginalized Sections?

- **Pradhan Mantri Mudra Yojana (PMMY)**
- **Stand-Up India Scheme**
- **Ambedkar Social Innovation and Incubation Mission**
- **Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana**
- **Special Credit Linked Capital Subsidy Scheme**
- **Rashtriya Garima Abhiyaan:**
  - National campaign for dignity and eradication of the practice of manual scavenging and rehabilitate the manual scavengers.

Credit Assistance Program for Jan Aushadhi Kendras

Why in News?

Recently, the Union Minister for Chemicals & Fertilizers and Health & Family Welfare, inaugurated a **credit assistance program for Jan Aushadhi Kendras (JAK)** aiming to enhance accessibility to affordable medicines across India.

- As a part of the program a memorandum of understanding (MoU) was signed between the **Small Industries Development Bank of India (SIDBI)** and the **Pharmaceuticals and Medical Devices Bureau of India (PMBI)** to provide financial assistance and support infrastructure development for JAKs.

What is the Credit Assistance Program for Jan Aushadhi Kendras?

- The Government of India under this program will provide credit/loan assistance to operators/ entrepreneurs running Jan Aushadhi Kendras across the country.
- The credit assistance program utilizes both **Goods and Services Tax (GST) and India's Digital Public Infrastructure (DPI)** to offer unsecured working capital loans to small businesses.
  - Through this program, operators can access unsecured working capital loans and infrastructure funding to establish and maintain their Jan Aushadhi Kendras.
  - The program seeks to **empower small entrepreneurs,** enhance the accessibility of affordable medicines, and strengthen the healthcare ecosystem in India.

What are Jan Aushadhi Kendras?

- **About:**
  - Jan Aushadhi Kendras (JAKs) is a government initiative launched to provide affordable and quality medicines to the public.
    - They operate under the **Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) scheme** of the Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers.
- **PMBJP Scheme:**
  - The **Jan Aushadhi Scheme**, revamped as **Pradhan Mantri Jan Aushadhi Yojana (PMJAY)** in September 2015, aimed to make quality medicines available at affordable prices, particularly for the poor and disadvantaged.
  - In November 2016, the scheme underwent further enhancement and was renamed as **PMBJP** to strengthen its impact.
  - PMBJP, focuses on providing **generic drugs** through exclusive outlets known as **Jan Aushadhi Kendras.**
    - These stores offer generic medicines at significantly lower prices compared to branded drugs, ensuring reduced out-of-pocket expenses for healthcare.
    - Generic drugs provided by PMBJP stores are equivalent in quality and efficacy to expensive branded drugs, promoting the rational use of medications.
- **Benefits of Jan Aushadhi Kendras:**
  - **Increased affordability of medicines:** JAKs have significantly reduced healthcare costs for many people and reduced out-of-pocket expenditure.
    - Indian citizens have collectively **saved over Rs. 28,000 crores** over the last decade by purchasing medicines from Jan Aushadhi Kendras.
  - **Improved access to medicines**: JAKs have made essential medicines more readily available in underserved areas.
    - Around 10 to 12 lakh people visit JAKs daily.

Note:

- **Promotion of rational medicine use**: JAKs provide information and counselling on the appropriate use of medicines, which can help to reduce misuse and overuse.

➢ **Expansion of Jan Aushadhi Kendras:**

- PMBJP has expanded significantly in recent years, from only 80 Jan Aushadhi Kendras in 2014, to around **11,000 units operating across the country today.**
- The government aims to further increase the number of Jan Aushadhi Kendras to 25,000 in the next two years.

SIDBI

➢ The Small Industries Development Bank of India (SIDBI) is the primary financial institution for promoting, financing, and developing the Micro, Small, and Medium Enterprise (MSME) sector in India.

➢ SIDBI was established in 1990 and is the **apex regulatory body for licensing and regulating MSME finance companies.** It is under the jurisdiction of the **Ministry of Finance,** SIDBI is headquartered in Lucknow and has offices all over the country.

➢ SIDBI also supports **national climate change action plans** and promotes responsible business practices, such as energy efficiency, cleaner production, and sustainable financing.

PMBI

➢ The PMBI is a government agency that **coordinates the supply, procurement, and marketing of generic drugs** through the PMBJKs.

➢ The PMBI is part of the Department of Pharmaceuticals and is responsible for implementing the PMBJP.

What are India's Other Initiatives for Affordable Healthcare?

➢ Ayushman Bharat Pradhan Mantri Jan Arogya Yojana.

➢ National Health Mission (NHM).

➢ Pradhan Mantri Swasthya Suraksha Yojana .

➢ Janani Shishu Suraksha Karyakram (JSSK).

➢ Rashtriya Bal Swasthya Karyakram (RBSK).

➢ Rashtriya Arogya Nidhi (RAN).

➢ Affordable Medicines and Reliable Implants for Treatment (AMRIT) Deendayal Outlets.

NITI for States Platform

Why in News?

Recently, the Union Minister of Electronics & Information Technology inaugurated the **'NITI for States'** platform, a digital initiative aimed at empowering states and union territories (UTs) in their pursuit of national development goals.

➢ The '**Viksit Bharat Strategy Room**' at NITI Aayog was also inaugurated.

What is NITI for States Platform?

➢ **About**: Developed by NITI Aayog, "the NITI for States" platform serves as a repository of valuable resources, aiming to integrate data across states, centralising findings to inform future decisions by state governments based on **data-driven insights.**

- The platform incorporates real-time data updation and monitoring, spanning 10 sectors and two cross-cutting themes.
  - Sectors include agriculture, education, energy, health, livelihoods and skilling, manufacturing, micro, small and medium enterprise, tourism, urban, water resources, and WASH (water, sanitation, and hygiene).
  - Cross-cutting themes encompass gender and climate change.

➢ **Features:**

- **Extensive Knowledge Base**: Curated best practices, policy documents, datasets, data profiles, and NITI Aayog publications.
- **Multilingual Accessibility:** Inclusive access in major Indian languages and foreign languages.
- **Capacity Building Initiatives:** Tailored digital training modules for officials at block, district, and state levels.
- **Expert Help Desk:** Specialised guidance through partnerships with leading institutions.
- **Data Integration:** Leverages data from the National Data & Analytics Platform (NDAP) for comprehensive insights.

What is the Viksit Bharat Strategy Room?

➢ The Viksit Bharat Strategy Room is an interactive space where users will be able to **visualise data, trends, best practices and policie**s in an immersive environment and make a holistic assessment of any problem statement.

➢ It also allows users to interact through **voice-enabled AI,** and connect to multiple stakeholders through video conferencing.

- It is designed to become a **plug-and-play model** to enable replication at state, district and block levels.

Note:


Composition of #NITIaayog
Chairperson
•Prime Minister
Governing Council
•CMs (States) and Lt Governors (UTs)
Regional Councils
•Formed on need-basis, comprising CMs and Lt Govs of the region
Members
•Full-time basis
Part-time Members
•Max 2, rotational, from relevant institutions
Ex-officio Members
•Max 4 from Council of Ministers, nominated by PM
Special Invitees
•Experts, specialists, practitioners with domain knowledge
Chief Executive Officer
•Appointed by PM for fixed tenure, Secy rank
Secretariat
•As deemed necessary
Source: PIB.NIC.IN

Note:

What are the NITI Aayog's Initiatives Driving Development Across States?

- **Development Support Services for States (DSSS):** NITI Aayog assists with project planning, financing, and implementation to ensure successful infrastructure creation.
  - It also aims to establish Public-Private Partnerships (PPPs) as governance tools supporting larger development agenda.
- **Aspirational Districts Programme (ADP):** It aims to quickly and effectively transform 112 most under-developed districts across the country.
  - NITI Aayog works with them to **improve core metrics in education, health, nutrition, and basic infrastructure.**
- **Composite Water Management Index (CWMI):** It provides an annual snapshot of the water sector status and water management performance of the states and union territories (UTs) in India.
- **SDG India Index:** This index tracks India's progress towards achieving the UN Sustainable Development Goals (SDGs).
  - It provides valuable data for states to identify areas needing greater focus and promotes collaborative action.
- **SATH (Sustainable Action for Transforming Human Capital):** It was launched in 2017 to identify and build three **'role model' States for the school education sector.**
  - **Jharkhand, Odisha and Madhya Pradesh** were chosen for the same.
- **Atal Innovation Mission (AIM):** It aims to create and promote an ecosystem of innovation and entrepreneurship across the country at **school, university, research institutions, MSME and industry levels.**
  - Recently, Atal Innovation Mission and Meta collaborated to launch **Frontier Technology Labs (FTLs)** in schools across India.
    - AIM has already established **10,000 Atal Tinkering Labs (ATLs)** in schools nationwide, focusing on fostering curiosity and creativity among students.
    - FTLs are an advanced version of ATLs, equipped with state-of-the-art infrastructure to empower students in frontier technologies like AI, AR/VR, Blockchain, Cybersecurity, Robotics, 3D Printing, and IoT.

■■■

Note:

Economic Scenario

Highlights

India Employment Report 2024: ILO

Why in News?

Recently, the **Institute for Human Development (IHD)** and **International Labour Organisation (ILO)** have released a report titled- ***'India Employment Report 2024',*** which highlights that India's youth **continue to grapple with soaring Unemployment rates**.

- The **Institute for Human Development (IHD)** was established in the year 1998 under the aegis of the **Indian Society of Labour Economics (ISLE)**, it is a non-profit autonomous institution that aims to **contribute towards building a society** that fosters and values an inclusive social, economic and political system that is free from poverty and deprivations.

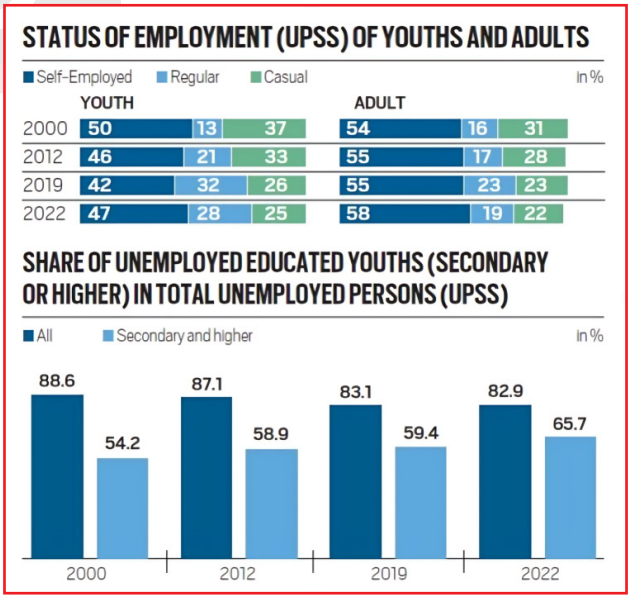
Note:

The **India Employment Report 2024** is the **third in the series of regular publications by the IHD** on labour and employment issues. This report on Youth Employment, Education and Skills examines the **challenge of youth employment in the context of the emerging economi**c, labour market, educational and skills scenario in India and changes over the past two decades.

- The report is primarily **based on analysis of data from the National Sample Surveys and the Periodic Labour Force Surveys** between 2000 and 2022, with a postscript for 2023.

What are the Key Highlights of the Report?

- **Poor Employment Conditions:**
  - Despite improvements in overall labour force participation and employment rates, employment conditions in **India remain poor**, with issues such as **stagnant or declining wages**, increased self-employment among women, and a higher proportion of unpaid family work among youth.
  - India's **youth account for almost 83% of the unemployed workforce** and the share of youngsters with secondary or higher education in the total unemployed has almost doubled from **35.2% in 2000 to 65.7% in 2022.**

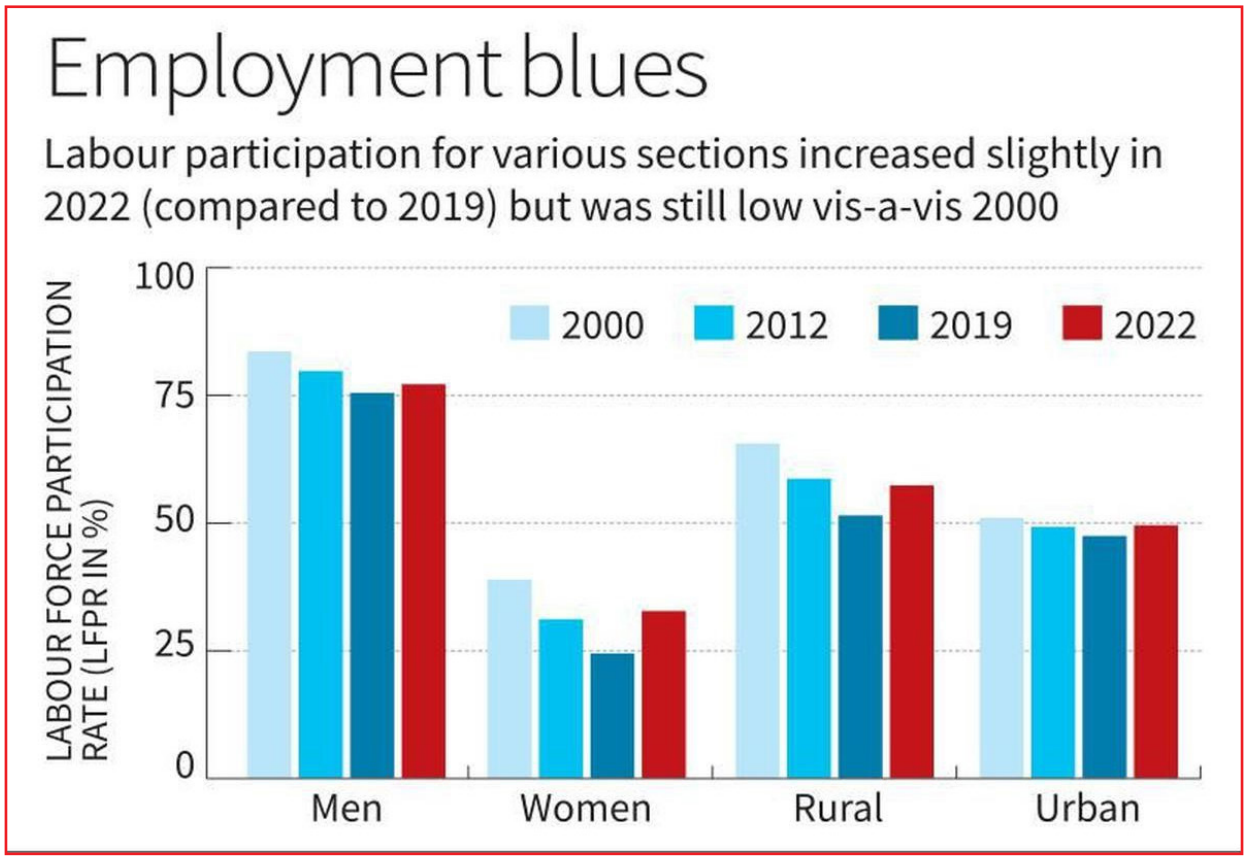


- **Youth Employment Challenges:**
  - Youth employment and **underemployment surged between 2000 and 2019**, with educated youths experiencing significantly higher levels of joblessness.
  - The **Labour Force Participation Rate (LFPR)**, **Worker Population Ratio (WPR)** and the **Unemployment**

Note:

Rate (UR) showed a long-term deterioration between 2000 and 2018 but witnessed an improvement after 2019.

- The improvement coincides with periods of economic distress, both pre and post-**Covid-19** with the exception of two peak Covid-19 quarters.



- **Paradoxical Improvements:**
  - Over the past two decades, India's job market has seen some improvements in certain labour indicators, but the o**verall employment situation remains challenging.**
  - **Non-farm sectors have not grown sufficiently to absorb workers from agriculture,** despite non-farm employment growing faster than farm employment before 2018.
  - Most workers, **around 90%, are engaged in informal work**, and the proportion of regular employment, which was steadily increasing after **2000, started declining after 2018.**
  - India's large young workforce, often seen as a demographic advantage, faces challenges due to **a lack of necessary skills.**
    - A significant portion of **youth lacks basic digital literacy skills**, with 75% unable to send emails with attachments, 60% unable to copy and paste files, and 90% unable to perform basic spreadsheet tasks like putting a mathematical formula.
- **Wages and Earnings are Declining:**
  - While **wages of casual labourers maintained a modest upward trend** during 2012–22, real wages of regular workers either remained stagnant or declined. Self Employed real earnings also declined after 2019.
  - Overall, wages have remained low. As much as **62% of the unskilled** casual agricultural workers and **70% of such workers in the construction** sector at the **all-India level did not receive the prescribed daily minimum wages in 2022.**
- **Changing the Structure of Industrial Employment**:
  - There has been a rapid introduction of digitally mediated gig and platform work, which are

Note:

algorithmically **controlled by the platforms and have brought about new features in control** of the labour process.

- Increasingly, platform and gig work have been expanding, but it is, to a large extent, the extension of informal work, with hardly any social security provisions.

➢ **Migration is Likely to Increase in Future:**

- The rates of urbanization and migration are expected to considerably increase in the future.
- India is **expected to have a migration rate of around 40% in 2030** and will have an urban population of around 607 million.
- The bulk of this **increase in urban growth will come from migration**. The pattern of migration also shows regional imbalance in the labour markets.
- The **direction of migration** in general is from eastern, north-eastern and central regions to southern, western and northern regions.

➢ **Regional Disparities:**

- Significant variations in employment outcomes exist across states, with certain **states consistently ranking lower in employment indicators**.
- States like Bihar, Uttar Pradesh, Odisha, Madhya Pradesh, Jharkhand, and Chhattisgarh have s**truggled with poor employment outcome**s over the years, **reflecting the influence of regional policies.**

➢ **Widening Gender Gap:**

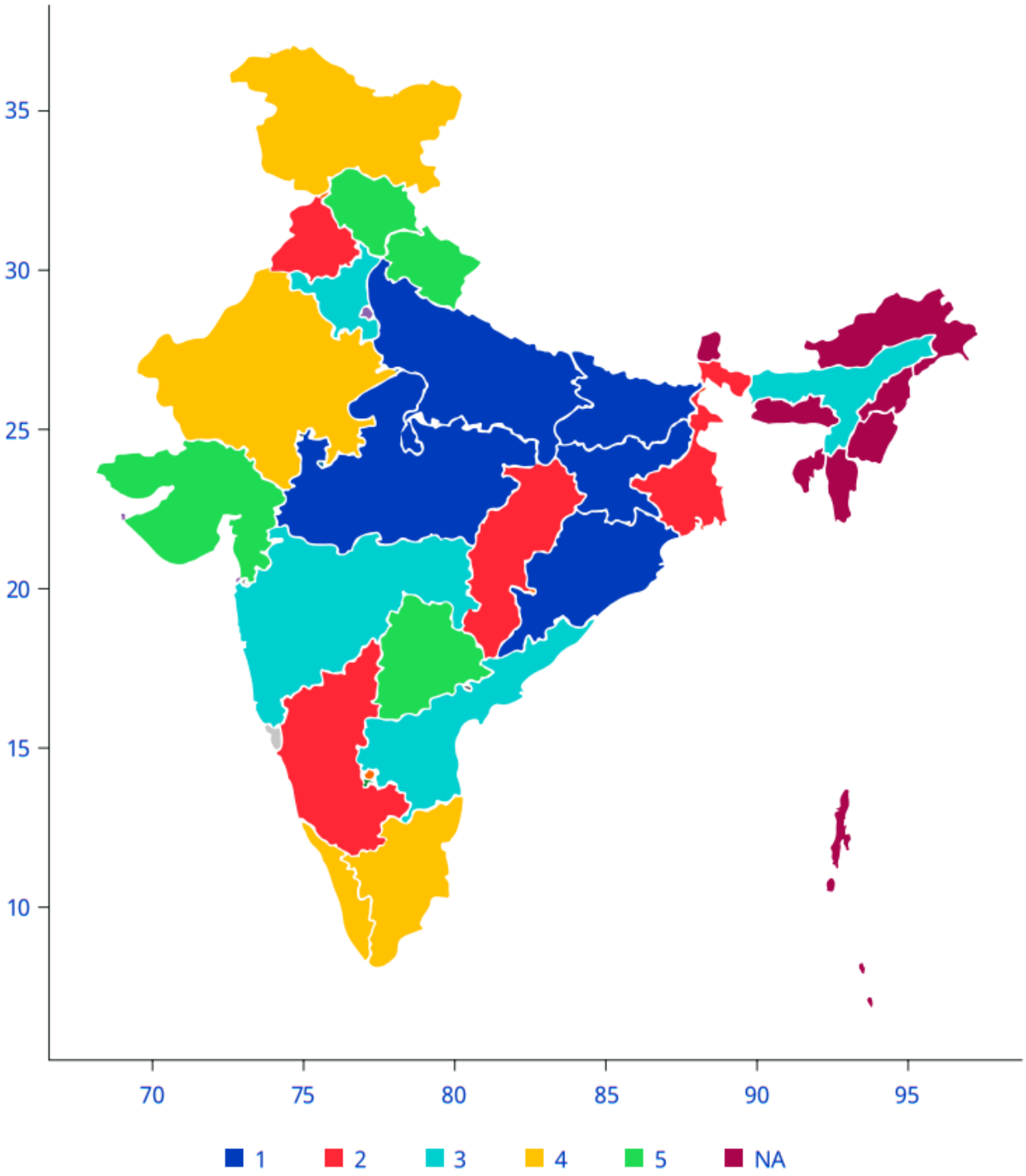
- India is facing the **challenge of a substantial gender gap** in the labour market, with low rates of female labour force participation.
- The **unemployment challenge among young women,** especially those who are highly educated, is enormous.
- Social inequalities also persist despite affirmative action and targeted policies, with **Scheduled Castes and Scheduled Tribes** facing barriers to accessing better job opportunities.
  - Although educational attainment has improved across all groups, social hierarchies persist, **exacerbating the employment disparity.**

➢ **Policy Recommendations:**

- To enhance production and **foster growth with a focus on employment**, policy recommendations are proposed:
  - Integrate an **employment creation agenda into macroeconomic policies,** particularly emphasising productive non-farm employment, notably in manufacturing.
  - **Prioritise labour-intensive manufacturing to absorb unskilled labour** and complement with selected services.
  - Concentrate efforts on **supporting micro, small, and medium-sized enterprises** through a decentralised approach.
  - **Increase agricultural productivity**, generate non-farm employment opportunities, and **encourage entrepreneurship.**
  - **Invest in green and blue economies,** leveraging strategic investments, capacity-building initiatives, and policy frameworks to unlock substantial employment potential.
- **To enhance job quality, strategies are recommended:**
  - There's a **need to invest in and regulate sectors** such as the **care industry and the digital economy,** which are anticipated to be significant sources of employment for young people.
  - **Fostering an inclusive urbanisation and migration policy** is essential, particularly given India's projected rise in urbanisation and migration rates, driven by youths seeking decent employment opportunities, predominantly in urban areas.
  - Ensuring a **robust supportive role for labour policy** and regulation is crucial. This involves **guaranteeing a minimum standard of employment** quality and safeguarding basic rights for workers across all sectors.
- **To address labour market inequalities, key approaches are suggested:**
  - Implement **policies to enhance women's participation** in quality employment.
  - Integrate **high-quality skills training into education to uplift economically disadvantaged groups** and boost employability.
  - Iimprove access to **information technology and bridge the digital gap.** Establish a **fair labour market by combating discrimination** against women and marginalised communities.

Note:

▶ **Figure 2.17. Overall employment condition index**



Source: Computed from various years of the Employment and Unemployment Survey data and the Periodic Labour Force Survey unit-level data.

Note:

What are the Government's Initiatives Related to Employment?

- Support for Marginalised Individuals for Livelihood and Enterprise (SMILE)
- PM-DAKSH (Pradhan Mantri Dakshta Aur Kushalta Sampann Hitgrahi)
- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)
- Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
- Start Up India Scheme
- Rozgar Mela
- Indira Gandhi Urban Employment Guarantee Scheme- Rajasthan.

What is the International Labor Organization?

- It is the only tripartite United Nations **(UN) agency**. It brings together governments, employers and workers of 187 Member States (India is a member), to set labour standards, develop policies and devise programmes promoting decent work for all women and men.
  - It received the Nobel Peace Prize **in 1969.**
- It was established in 1919 by the Treaty of Versailles as an affiliated agency of the League of Nations and became the first affiliated specialised agency of the UN in 1946.
- Headquarters: Geneva, Switzerland

Omnibus SRO Framework

Why in News?

The Reserve Bank of India (RBI) has recently announced the finalisation of the **Omnibus Framework** for recognising **Self-Regulatory Organisations (SRO)** for its Regulated Entities (RE).

- The framework aims to address the increasing operations of regulated entities and the adoption of innovative technologies, while also improving industry standards for self-regulation.

Note:

- The draft framework was released for public comments on December 21, 2023, following an announcement in the Monetary Policy **Statement** of RBI.
- Inputs received from stakeholders were examined to finalise the Omnibus Framework.

What is the Omnibus SRO Framework?

- The Omnibus Framework is a comprehensive set of guidelines and regulations for recognising **Self-Regulatory Organisations (SROs).**
- The omnibus SRO framework sets out **common objectives, functions, eligibility criteria, and governance** standards for all SROs, regardless of the sector.
- It also **establishes membership criteria and terms for SROs** to follow in order to be recognised by the RBI.
- The framework represents the minimum requirements, and recognised SROs are encouraged to develop their best practices.
- The **Reserve Bank may impose sector-specific additional conditions** when calling for applications to recognise SROs, within the framework's broad parameters.
- It facilitates a coordinated and integrated approach to regulatory oversight while allowing for sector-specific guidelines to be issued separately for different sectors.
- Aims to foster **transparency, professionalism, and independence** within SROs to build confidence in the integrity of the sectors they regulate.

Note:

- Existing SROs recognized by the RBI will continue to be **governed by their current terms and conditions** unless the framework is specifically extended to them.

Self-Regulatory Organisations

- SROs are entities formed within **specific industries or sectors** to regulate themselves, often in collaboration with government regulators.
- SROs operate under the **supervision of government regulators**, who delegate certain regulatory functions to these organisations. While **regulators maintain ultimate authority,** they rely on SROs to monitor and enforce compliance within their respective industries.
- SROs aim to promote best practices and **ethical conduct within their industries**. They often provide guidance, training, and educational resources to help members understand and comply with regulatory requirements.
- These organisations develop and enforce industry-specific rules, standards, and codes of conduct aimed at ensuring compliance and ethical behaviour among their members.
- SROs operate with **transparency and accountability to ensure that their regulatory activities** are conducted in the public interest.

Note:

Bond Yield

Why in News?

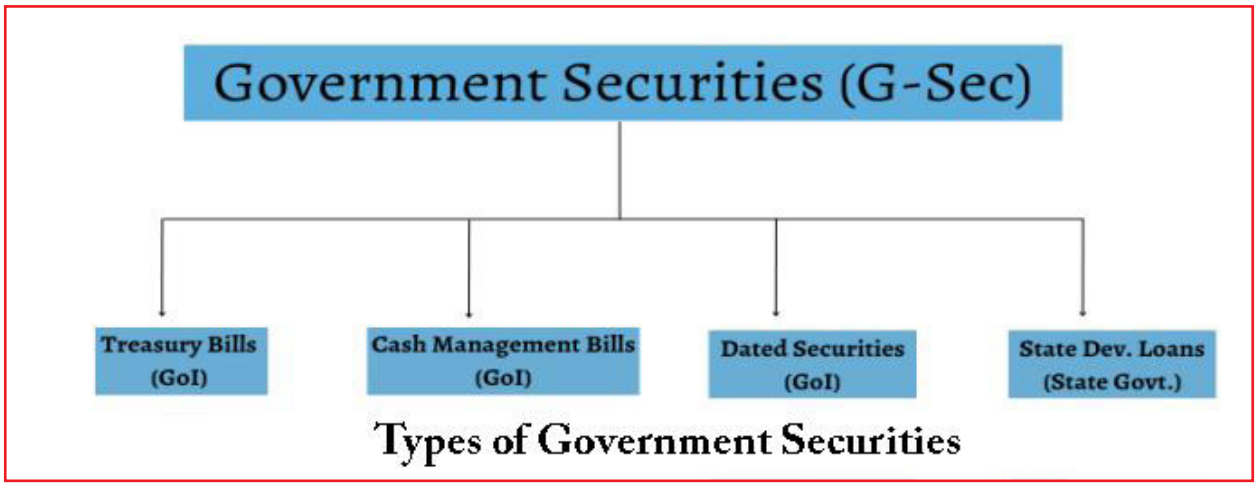
Recently, the State governments have **mobilised a record Rs 50,206 crore** through the auction of **State Development Loan (SDL) Bonds**, marking the largest such weekly borrowing ever.

- The funds raised far exceeded the indicative borrowing target of Rs 27,810 crore set for the period, as per **Reserve Bank of India (RBI)** data. This indicates robust demand for state government securities in the financial markets.
- SDLs are the part of **Government Securities (G-Sec)**, where State Governments raise loans from the **market**. SDLs are dated s**ecurities issued through normal auctions similar to the auctions conducted for dated securitie**s issued by the Central Government.

What are Bonds?

- **About:**
  - A bond is an **instrument to borrow money**. It is like an IOU (I owe you).
    - An IOU is a written acknowledgement of debt that one party owes another. IOUs are less formal and legally binding than promissory notes.
  - A bond could be **floated/issued by a country's government** or by a company to raise funds.
  - Since **Government Bonds (referred to as G-secs in India**, Treasury in the US, and Gilts in the UK) come with the **sovereign's guarantee,** they are considered one of the safest investments.
- **Types of G-Secs:**
  - **Treasury Bills (T-bills):** Treasury bills are zero coupon securities and pay no interest. Instead, they are issued at a discount and redeemed at the face value at maturity.
  - **Cash Management Bills (CMBs):** In 2010, the Government of India, in consultation with RBI introduced a new short-term instrument, known as CMBs, to meet the temporary mismatches in the cash flow of the Government of India.
    - The CMBs have the generic character of T-bills but are issued for maturities of less than 91 days.
  - **Dated G-Secs:** Dated G-Secs are securities that carry a fixed or floating coupon rate (interest rate) which is paid on the face value, on a half-yearly basis. Generally, the tenor of dated securities ranges from 5 years to 40 years.
  - **State Development Loans (SDLs):** State Governments also raise loans from the market which are called SDLs. SDLs are dated securities issued through normal auctions similar to the auctions conducted for dated securities issued by the Central Government.

Note:



Types of Government Securities

- **Bond Yields:**
  - The yield of a bond is the **effective rate of return that it earns.** But the rate of return is not fixed — it **changes with the price** of the bond.
  - But to understand that, one **must first understand how bonds are structure**d.
  - Every bond has a f**ace value and a coupon payment.** There is also the price of the bond, which may or may no**t be equal to the face value of the bond.**
  - In addition to the face value and coupon payment, bonds also have a **coupon rate.**
    - The coupon rate is the **fixed annual interest rate expressed as a percentage** of the bond's face value.
    - **For Instance, t**he face value of a **10-year G-sec is Rs 100**, and its coupon payment is **Rs 5, and coupon rate is 5%.**
  - Buyers of this bond will give the government Rs 100 (the face value); in return, the government will pay **them Rs 5** (the coupon payment) every year for **the next 10 years**, and will pay back their Rs **100 at the end of the tenure.**
    - In this case, the bond's yield, or **effective rate of interest, is 5%**. The yield is the **investor's reward for parting with Rs 100 toda**y, but for staying without it for 10 years.
- **Yield Curve:**
  - The Yield Curve is a graphical representation of the **interest rates on debt for a range of maturities**.
  - It shows the yield an **investor is expecting to earn if he lends his money for a given period** of time.
  - A fixed income Analyst may use the yield curve as a leading economic indicator, especially when **it shifts to an inverted shap**e, which signals an economic downturn, as long-term returns **are lower than short-term returns.**

How Does RBI Manage Bond Yield?

- The Reserve Bank of India (RBI) employs **Open Market Operations (OMOs)** as a pivotal tool to manage bond yields and regulate **monetary conditions within the economy. Through OMO**s, the RBI strategically sells or purchases Government Securities (G-secs) in the open market.
- When the RBI aims to curb excess liquidity and temper inflationary pressures, it sells G-secs, effectively **absorbing liquidity from the market.** Conversely, to stimulate economic activity and bolster liquidity, the RBI buys back G-secs, injecting funds into the system.
  - When the RBI sells G-secs, it puts upward pressure on bond yields, making borrowing costlier and thereby curbing excessive borrowing and spending. Conversely, purchasing G-secs tends to drive bond prices higher, pushing yields lower, which can encourage borrowing and investment.
- In conjunction with OMOs, the RBI employs a suite of **monetary policy tools including the repo rate, cash reserve ratio, and statutory liquidity ratio**.
  - By strategically deploying these tools, the RBI orchestrates a comprehensive approach to managing bond yields and fostering stable economic conditions conducive to growth and stability.

What are the Factors Influencing the Yield Curve?

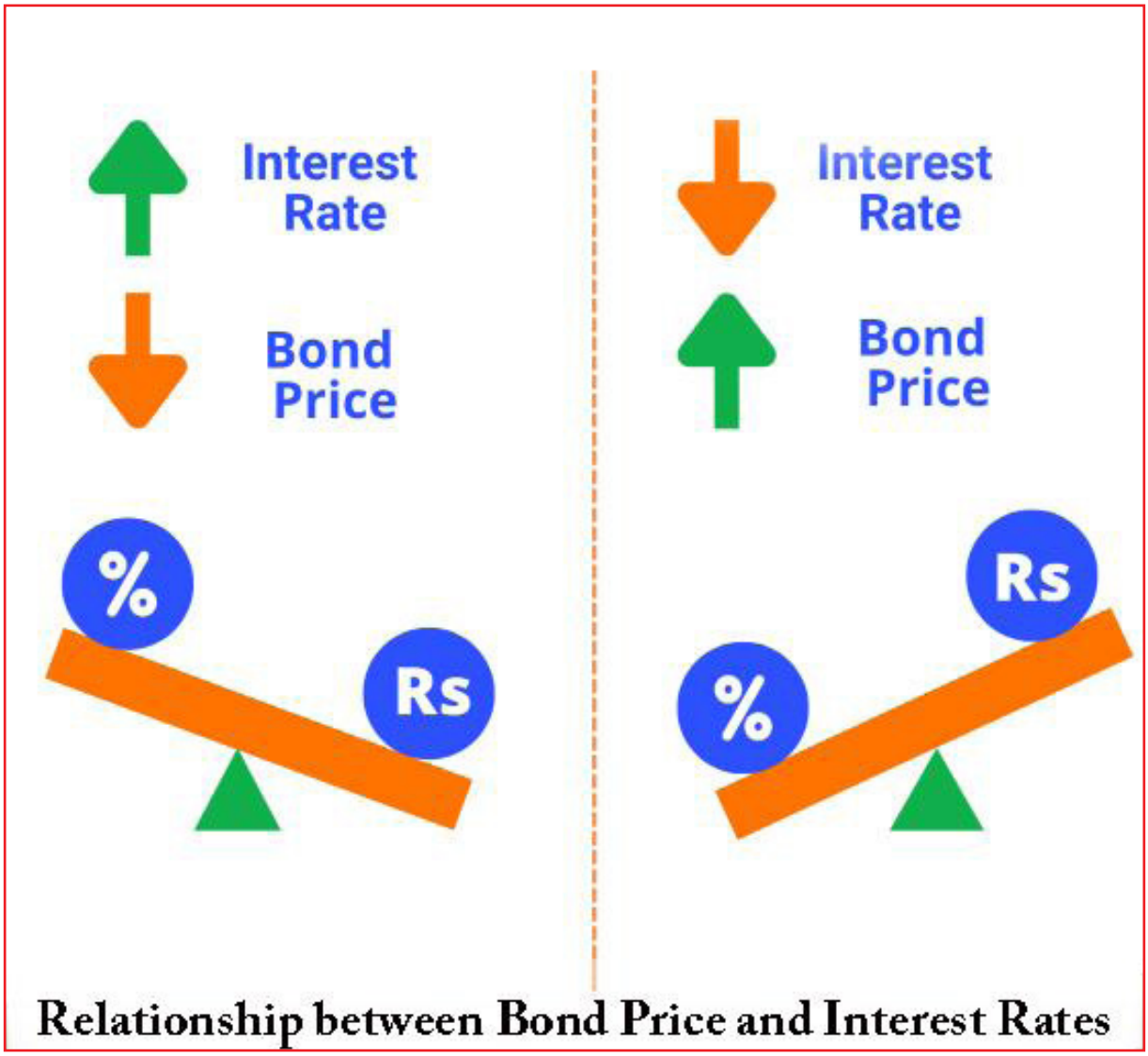
- **Market Demand and Bond Prices:**
  - Imagine there's only one bond available, and two buyers want to buy it. They might bid **against each other, driving the bond's price up.**

Note:

- Even though the bond's face value remains the same, say Rs 100, if it's sold for Rs 110, the yield decreases because the **coupon payment remains constant at, say, Rs 5.** So, the yield is effectively calculated based on the price paid for the bond.

➢ **Alignment with Economy's Interest Rate:**

- If the interest rate in the economy is different from the bond's **initial coupon payment,** market forces adjust the bond's yield to align with the prevailing interest rate.
- For example, if the economy's interest rate **is 4% and a bond offers a 5% yield**, many investors will rush to buy it for a higher return.
- This demand drives up the bond's price until its **yield matches the economy's interest rate.**
  - Conversely, if the economy's interest rate is higher than the bond's yield, the bond's **price decreases until its yield matches the prevailing rate.**
- **Analogy:** If the economy's interest rate is higher than the bond's yield, it's like having a heavier weight on the side of the economy's interest rate. This causes the seesaw to tilt towards the economy's interest rate side, indicating that the bond's yield is lower relative to the interest rate.
  - Conversely, if the **bond's yield is higher than the economy's interest rat**e, it's like having a heavier weight on the side of the bond's yield. This tilts the seesaw towards the bond's yield side, indicating that the bond's yield is higher relative to the interest rate.



Relationship between Bond Price and Interest Rates

Note:

What will be the Impact of the Hardening of Bond Yield?

- **Losses to Banks and Mutual Funds:**
  - Both banks and mutual funds holding government securities (g-secs) will suffer losses due to the inverse relationship between bond prices and yields. As bond yields rise, bond prices fall, leading to mark-to-market losses for these institutions.
- **Increased Cost of Borrowings:**
  - Higher yields on government securities imply that the government will have to offer higher interest rates on fresh borrowings. This increase in government borrowing costs can have a ripple effect on the entire economy, leading to higher interest rates for corporates and potentially higher lending rates for banks, affecting the cost of borrowing for businesses and individuals.
- **Impact on Corporate Bonds:**
  - Corporates may need to increase interest rates on their bonds to attract investors amid rising bond yields in the market. This could lead to higher borrowing costs for companies, potentially impacting their profitability and investment decisions.
- **Impact on Equity Markets:**
  - As bond yields rise, the opportunity cost of investing in equities increases since fixed-income securities become relatively more attractive compared to stocks. Investors may shift their allocations away from equities towards bonds, leading to a decrease in demand for stocks and potentially resulting in a decline in equity prices.

RBI to Review NBFCs

Why in News?

The **Reserve Bank of India (RBI)** is gearing up to conduct a comprehensive review of the categorisation of **Non-Banking Finance Companies (NBFCs) in 2024.**

- The review is seen as a precursor to potentially granting bank licences to select NBFCs.
- Elevating specific NBFCs could serve as a preliminary and evaluative step towards considering them for the allocation of bank licences in the future.

What are NBFCs?

- **About:** An NBFC is a company registered under the **Companies Act, 1956 or Companies Act, 2013,** involved in various financial activities like lending, investing in securities, leasing, insurance.
  - They offer various banking services but do not have a banking licence.
- **Key Features:**
  - NBFCs provide diverse financial services like personal loans, home loans, vehicle loans, gold loans, microfinance, insurance, and investment management.
  - They can accept public deposits for a minimum of **12 months and a maximum of 60 months.**
    - However, NBFCs **cannot accept demand deposits.**
  - They **do not form part of the payment and settlement system** and cannot issue cheques drawn on itself.
- **Classification:**
  - **On the Basis of Deposits:**
    - Deposit-taking non-banking finance companies
    - Non-Deposit taking Non-Banking Financial Institutions
  - **On the Nature of their Major Activity:**
    - Investment and Credit Company
    - Consumer Durable Loan Finance
    - Core Investment
    - Company (CIC)
    - Infrastructure Finance Company (IFC)/ Infrastructure Debt Fund (IDF)
    - Asset Reconstruction Companies (ARC)
    - Factoring Companies
    - Gold Loan Companies
    - Fintech cos: P2P Lenders
- **Licencing:** The company must be registered under the **Companies Act, 2013,** either as a public or private company.
  - The company should have a minimum net owned fund of at least **Rs. 10 crores** to be eligible for NBFC registration.
  - At least **one-third of the directors** of the company must possess relevant work experience in the finance sector.
  - The company should have a good track record with **CIBIL (Credit Information Bureau India Limited)** regarding its credit history and financial credibility.
  - The company must comply with all the regulations, norms, and guidelines prescribed under Capital Compliances and the **Foreign Exchange Management Act (FEMA) laws.**

Note:

- **Regulation:** The RBI has been given the powers under the **RBI Act 1934** to register, lay down policy, issue directions, inspect, regulate, supervise and exercise surveillance over NBFCs that meet the **50-50 criteria of principal business.**
  - The Reserve Bank introduced the Scale Based Regulation (SBR) in October, 2021, categorising NBFCs into **Base Layer (NBFC-BL), Middle Layer (NBFC-ML), Upper Layer (NBFC-UL), and Top Layer (NBFC-TL)**.
  - This framework outlines the methodology for identifying NBFCs in the Upper Layer based on their asset size and scoring criteria.

List of NBFCs in upper layer

1	LIC Housing Finance	9	Shanghvi Finance Pvt Ltd
2	Bajaj Finance	10	M&M Financial Services
3	Shriram Finance	11	PNB Housing Finance
4	Tata Sons Pvt Ltd	12	Tata Capital Financial Services
5	L&T Finance	13	Aditya Birla Finance
6	Indiabulls Housing Finance	14	HDB Financial Services
7	Piramal Capital & Housing Finance	15	Muthoot Finance
8	Cholamandalam Investment and Finance	16	Bajaj Housing Finance

What is the 50-50 Criteria of Principal Business?

- RBI considers a company's principal business to be financial in nature if more than **50% of its total assets and gross income come from financial activities.**
  - This definition ensures that only companies primarily involved in financial operations are registered as NBFCs and fall under RBI's regulatory oversight.
- Companies primarily engaged in non-financial activities, even if they conduct some financial business on the side, are not regulated by RBI.
  - This assessment is commonly referred to as the **"50-50 criteria"** for determining a company's involvement in financial business.

Note:

Demand deposits refer to funds deposited in banks or financial institutions that can be **withdrawn by the account holder on demand** without any prior notice.

- They are highly liquid and accessible for day-to-day transactions, making them a preferred choice for individuals and businesses needing frequent access to their funds.

RBI Integrated Ombudsman Scheme

Why in News?

Recently, the Reserve Bank of India (RBI) has reported a spike of **68.2% in complaints under its Integrated Ombudsman Scheme (RB-IOS)** for the financial year 2023, with figures reaching a staggering 703,000.

- This leap marks a substantial rise compared to the previous years, where FY22 saw a 9.4% increase and FY21 witnessed a 15.7% hike in complaints.

What are the Factors Behind this Surge in Complaints?

- The central bank's vigorous **public awareness initiatives** played a significant role in encouraging **people to voice their concerns and grievances**. As people become more aware of their rights and avenues for complaint resolution, they are more likely to report issues they encounter with banks and non-bank payment system participants.

Note:

- The implementation of a **streamlined process for lodging complaints** makes it easier for the public to report issues they face with financial institutions.
  - When the **process is simplified and accessible,** individuals are more likely to engage with it, leading to an increase in the number of complaints received.
- With the **growing popularity of digital transactions,** especially in the realm of mobile and electronic banking, there is a higher likelihood of encountering issues such as unauthorised or fraudulent transactions.
  - The convenience of digital banking also means that any hiccups in the system can affect a **large number of users simultaneously, leading to an increase in complaints.**

What is an Ombudsman?

- A government official who deals with complaints made by **ordinary people against public organisations.** This concept of the Ombudsman arrived from Sweden.
- It means an officer appointed by the Legislature to **handle complaints against a service or administrative authority.**
- In India an Ombudsman is appointed to **resolve grievances in the following sectors.**
  - Insurance Ombudsman
  - Income Tax Ombudsman
  - Banking Ombudsman

What is RBI Integrated Ombudsman Scheme (RB-IOS)?

- **About:**
  - RB-IOS amalgamates three ombudsman schemes of **RBI-banking ombudsman scheme of 2006**, Ombudsman scheme for NBFCs of 2018 and Ombudsman scheme of digital transactions of 2019.
  - The unified ombudsman scheme aims to provide **redress of customer complaints involving deficiency in services rendered** by RBI-regulated entities viz. **banks,** NBFCs (Non-banking Financial Companies) **and pre-paid instrument players** if the grievance is not resolved to the satisfaction of the customers or not replied within a period of 30 days by the regulated entity.
  - It includes non-scheduled primary co-operative banks with a deposit size of Rs 50 crore and above.

  The integrated scheme makes it a "**One Nation One Ombudsman' approach** and jurisdiction-neutral.
- **Need:**
  - The first ombudsman scheme was rolled out in the 1990s. The system was always viewed as an issue by consumers.
  - One of the primary concerns was the **lack of maintainable grounds on which the consumer could challenge the actions** of a regulated entity at the ombudsman or rejection of the complaint on technical grounds, resulting in a preference for the consumer court notwithstanding the extended timelines for redressal.
  - The move to integrate the systems **(banking, NBFC, and digital payments)** and expand the grounds for complaints is expected to see a positive response from consumers.
- **Features:**
  - The Scheme defines '**deficiency in service' as the ground for filing a complaint,** with a specified list of exclusions.
    - Therefore, the complaints would no longer be rejected simply on account of "not covered under the grounds listed in the scheme".
  - The scheme is jurisdiction-neutral and a centralised receipt and processing centre has been set up in Chandigarh for initial handling of complaints in any language.
  - RBI had created a provision for the **use of Artificial Intelligence tools** so that banks and investigating agencies could coordinate in a better way in the fastest time possible.
  - The bank customers **will be able to file complaints, submit documents**, track their status, and give feedback through a single email address.
  - There will also be a multilingual toll-free number that will provide all relevant information on grievance redress.
  - The regulated entity **will not have any right to appeal in cases where an award is issued by the ombudsman** against it for not furnishing satisfactory and timely information.
- **Appellate Authority:**
  - **RBI's Executive Director in charge of the Consumer Education and Protection Department** would be the Appellate Authority under the integrated scheme.

Note:

- **Significance:**
  - This will help in improving the **grievance redress mechanism for resolving customer complaints** against RBI's regulated entities.
  - It is expected to **ensure uniformity and streamlined user-friendly mechanisms** which will add value to the scheme and bring customer delight and financial inclusion.

Boosting Exports from MSMEs: NITI Aayog

Why in News?

Recently, the **NITI Aayog** released a report titled **Boosting Exports from MSMEs**, which recommends that the government must make it easier for smaller firms to export their goods through e-commerce platforms.

What are the Key Recommendations of the Report?

- **Single Information Portal for Exporters:**
  - Niti Aayog recommends the creation of a single information portal for exporters, **leveraging AI-based interfaces** to provide comprehensive and up-to-date information on market tariffs, paperwork requirements, finance sources, service providers, incentives, and potential customers.
    - It recommended establishing a comprehensive **National Trade Portal (NTN)** to **streamline the export process** for MSMEs, facilitating seamless operations and competitive advantage.
- **Annual Financial Reconciliation Process:**
  - The report suggests introducing an annual financial reconciliation process for e-commerce exporters and exemptions on import duties for rejects or returns. It also proposes creating a **green channel clearance for e-commerce exports.**
- **Distinction Between Exporter on Record (EOR) and Seller on Record (SOR):**
  - To boost e-commerce exports, the report suggests distinguishing between EOR and SOR and allowing a reduction in invoice value without a percentage ceiling for all e-commerce exports.
    - EOR refers to the party or entity that is **officially recognised as the exporter of goods** in an international transaction. The EOR is responsible for complying with all export regulations, documentation, and customs requirements of the exporting country.
    - SOR refers to the party or entity that is legally **recognised as the seller in a commercial transaction.** The SOR is responsible for **selling the goods to the buyer and may handle tasks such** as negotiating the terms of sale, preparing invoices, arranging for shipping and delivery, and ensuring that the goods meet the agreed-upon specifications.
- **Promotion of Export Credit Guarantee:**
  - Access to finance is **highlighted as a significant bottleneck for MSMEs.** The report recommends **promoting the Export Credit Guarantee** to improve working capital availability, suggesting that the government create an incentive package to increase uptake **from the current 10% to 50% or more.**
- **Easing Merchandise Exports for MSMEs:**
  - Suggestions include the relaxation of compliance requirements for **MSMEs for a limited period** and implementing a time-bound disbursement process for incentives to prevent the blocking of working capital.
- **Identification of Export Opportunities in Specific Sectors:**
  - The report identifies various sectors where Indian MSMEs can compete in export markets, such as handicrafts, handloom textiles, ayurveda, herbal supplements, leather goods, imitation jewellery, and wooden products. It emphasises the substantial global market potential exceeding USD 340 billion for these sectors.

What is the Current Scenario of the MSME Sector in India?

- **MSME Contribution to the Economy:**
  - The report highlights the significant contribution of MSMEs to India's economy, accounting for over **11 crore jobs and around 27% of GDP (Gross Domestic Product).**

Note:

- **Rapid Growth in MSME Establishment:**
  - Between the financial year (FY) 2019 and FY 2021, India saw a significant increase in the establishment of new MSME units, **with around 40 lakh new MSMEs being established**. This growth is particularly notable in micro-enterprises.
  - Currently, around 38% of the total 54 lakh MSME units are engaged in manufacturing, with small and medium enterprises largely **contributing to manufacturing activity suitable for export.**
    - The top five states with the highest concentration of manufacturing MSMEs are Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka, and Gujarat.
- **Export Potential:**
  - Exporting is crucial for Indian MSMEs to unlock growth potential. However, **India's share of global exports of low-skilled manufacturing products is only 5%**, despite having a large working-age population and significant employment in manufacturing MSMEs.
    - Despite the potential for exporting, only a small percentage of MSMEs engage in it, with many **having annual turnover from exports of less than Rs 1 crore**.

What is MSME?

- MSMEs form the backbone of the Indian economy, contributing significantly to employment generation, industrial production, and overall economic growth.
- These enterprises are engaged in the **production, manufacturing, processing, or preservation of goods and commodities.**
  - They account for **38.4% of the total manufacturing output** and contribute 4**5.03% of the country's total exports.**

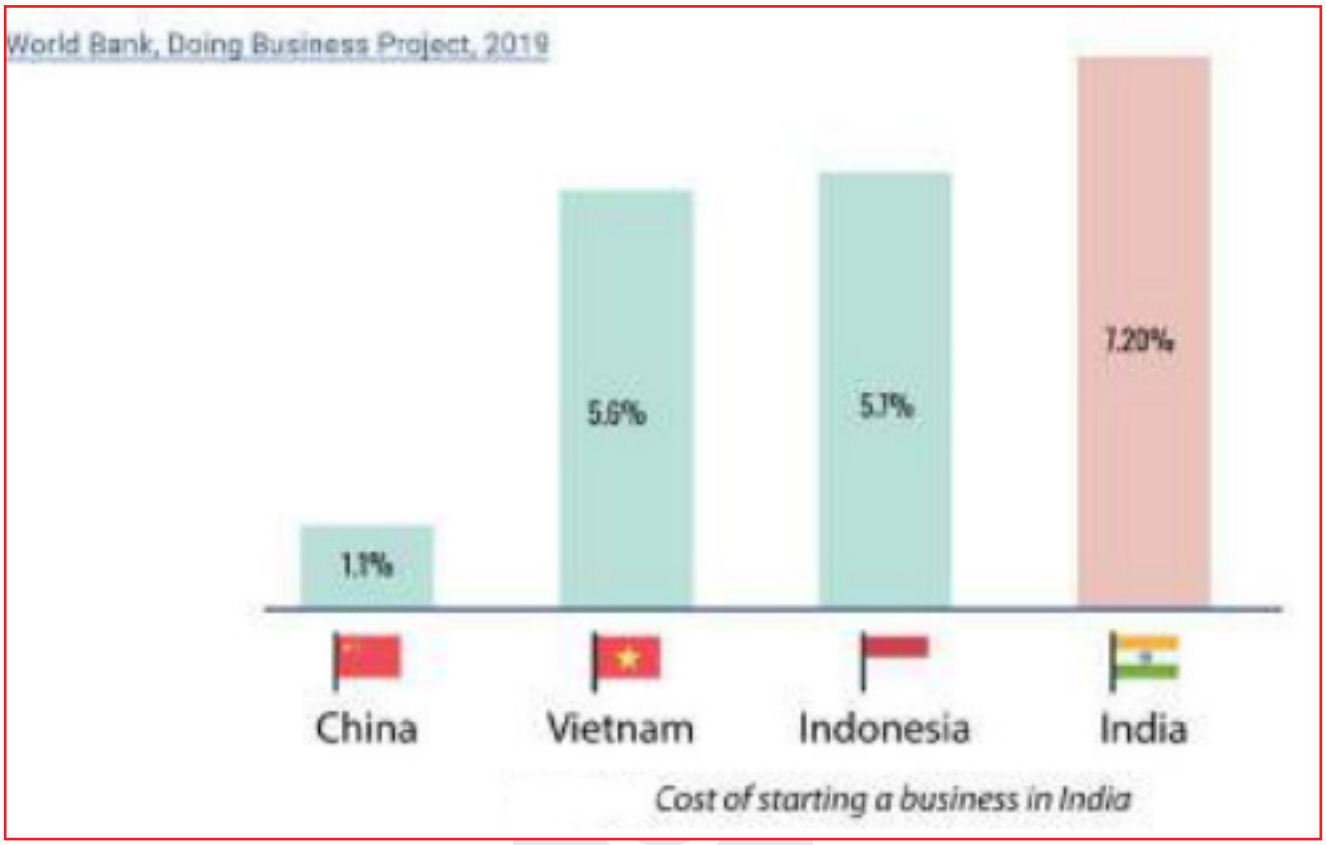
1: Revised Definition of Micro, Small and Medium Enterprises

Parameters	Micro	Small	Medium
Investment in Plant and Machinery	< 1 Crore INR	< 10 Crore INR	< 50 Crore INR
Annual Turnover	< 5 Crore INR	< 50 Crore INR	< 250 Crore INR
No. of MSMEs (Based on NSS data)	6.3 Crore	3.3 Lakh	5 thousand
No. of MSMEs (Based on Udyam data as on 31st March 2023)	1.5 Crore	4.6 Lakh	41 thousand

What are the Current Challenges Related to the MSME Sector in India?

- **Financial Constraint:**
  - In the **Indian economy,** access to finance has always been an issue for smaller firms and businesses. This is a major hindrance for businesses as well as the MSME sector.
  - However, the most disturbing fact about it is that **only 16% of SMEs get access to timely finance**, resulting in small and medium firms being forced to rely on their resources.
- **Lack of Innovation:**
  - Indian MSMEs lack innovation, and the majority of the products that they produce are based on outdated technologies. **There is a severe lack of entrepreneurs** in this sector, which has prevented it from adopting new technologies and tools.
  - Consequently, MSMEs have faced **challenges stemming from outdated technology and lower productivity levels**, particularly in comparison to larger firms.
- **Majority of Small Firms:**
  - Micro and small businesses **account for more than 80% of MSMEs**. Therefore, due to communication gaps and awareness, **they cannot take advantage of the government's emergency line of credit,** stressed asset relief, equity participation, and fund of funds operation.
- **Lack of Formalisation amongst MSMEs:**
  - MSMEs lack formalisation and this contributes to the credit gap.
  - Almost **86% of manufacturing MSMEs in the country are unregistered.** Even today, only about 1.1 crore MSMEs are registered with the **Goods and Services Tax.**

Note:



What are the Government Initiatives Related to MSMEs?

- Raising and Accelerating MSME Performance (RAMP) Scheme
- Credit Guarantee Trust Fund for Micro & Small Enterprises (CGTMSE)
- Interest Subsidy Eligibility Certificate (ISEC)
- A Scheme for Promoting Innovation, Rural Industry & Entrepreneurship (ASPIRE)
- Credit Linked Capital Subsidy for Technology Upgradation (CLCSS)
- Zero Defect & Zero Effect (ZED)

India's Basmati Rice Cultivation Dispute and the Direct Seeded Rice

Why in News?

Recently, India's prized basmati rice **varieties, like Pusa-1121 and 1509 Basmati,** have been found in Pakistan under new names, raising concerns among Indian scientists at the Indian Agricultural Research Institute (IARI), urging legal action to safeguard Indian farmers and exporters.

- This highlights the urgency for unified action to protect Indian farmers and maintain equitable trade practices.
- In another development, the **Federation of Seed Industries of India (FSII)** and Sathguru Consultants have emphasised the necessity for collaborative endeavours in rice cultivation, with a particular focus on direct seeded rice (DSR) techniques.

How are Indian Basmati Varieties Illegally Cultivated in Pakistan?

- **Illegal Cultivation:**
  - The cultivation of Indian basmati varieties in Pakistan began with Pusa **Basmati-1121 (PB-1121),** officially registered as **'PK 1121 Aromatic'** in Pakistan.
    - Other popular IARI-bred varieties like **Pusa Basmati-6 (PB-6) and PB-1509** have also been grown and renamed in Pakistan, posing a significant challenge to Indian agricultural authorities.

Note:

- More recent varieties such as Pusa Basmati-1847 (PB-1847), PB-1885, and PB-1886, designed to **resist bacterial blight and rice blast fungal disease,** have also been identified in Pakistani fields.

➢ **Implications:**

- The unauthorised cultivation of Indian basmati varieties in Pakistan undermines the **rights of Indian farmers and breeders** protected under the **Seeds Act, 1966,** and the **Protection of Plant Varieties and Farmers' Rights Act, 2001 (PPV & FR Act).**
  - The Protection of Plant Varieties and Farmers' Rights Act in India, enacted in 2001, protects the rights of Indian farmers to **sow, save, re-sow, exchange, or share the seed/grain produced from registered varieties.**
    - The Act prohibits selling the seeds of protected varieties in branded form without the breeder's rights.
    - **IARI-bred improved basmati varieties are registered under this Act.**
  - The Seeds Act of 1996, allows cultivation of IARI varieties only in the officially demarcated **Geographical Indication (GI) area** of basmati rice within India.
    - All basmati varieties bred by IARI are officially notified under the **Seeds Act, 1966 for cultivation.**
    - These varieties are designated for cultivation within the **officially demarcated Geographical Indication area of basmati rice in India, spanning 7 northern states (**Punjab, Haryana, Himachal Pradesh, Delhi, Uttarakhand, Uttar Pradesh (west) and two districts of Jammu & Kashmir (Jammu and Kathua)).
    - Even Indian farmers are prohibited from violating the breeder's rights by selling the seeds in branded, packaged, or labelled form.
    - These regulations aim to safeguard the intellectual property rights of breeders and ensure the exclusive rights of Indian farmers to cultivate and trade in protected basmati varieties.
- Cultivation of the protected basmati varieties in **Pakistan would potentially violate intellectual property rights (IPR)** and could be raised by India in relevant bilateral forums and at the **World Trade Organisation.**

Protection of Plant Varieties and Farmers' Rights Act, 2001

➢ **Rights under the Act:**

- **Breeders' Rights:**
  - Breeders are granted exclusive rights to produce, sell, market, distribute, import, or export protected varieties.
  - Breeder's rights include the ability to appoint agents or licensees and seek civil remedies for infringement.
- **Researchers' Rights:**
  - Researchers can utilise registered varieties for experimentation or research purposes.
  - **Initial use of a variety for developing another variety is permitted**, but repeated use requires prior permission from the registered breeder.
- **Farmers' Rights:**
  - Farmers who have evolved or developed new varieties are entitled to registration and protection similar to breeders.
  - Farmers **can save, use, exchange, share, or sell farm produce, including protected varieties,** subject to certain conditions.
  - Recognition and rewards are provided for farmers' conservation efforts related to plant genetic resources.
  - Compensation provisions exist for farmers in cases of non-performance of protected varieties.
  - Farmers are **exempt from paying fees in proceedings** under the Act before relevant authorities or courts.

How does this Affect the Global Basmati Market?

➢ In 2022-23, India exported **45.61 lakh tonnes of basmati rice** valued at USD 4.79 billion. India's basmati rice exports are on the brink of reaching record levels, with projections **indicating exports of 50 lakh tonnes worth $5.5 billion in the current fiscal year.**

- Notably, 89% of the estimated 21.35 lakh hectares of basmati area sown during Kharif 2023 was under IARI-bred varieties, with significant portions under specific varieties such as PB-1121, PB-1718, PB-1885, PB-1509, PB-1692, PB-1847, PB-1, PB-6, and PB-1886, raising concerns about the impact of illicit cultivation on export volumes and revenues.

➢ Pakistan's basmati exports, although lower than India's, have gained traction due to the **depreciation**

Note:

of the Pakistani rupee, enabling competitive pricing in international markets.

- The piracy of Indian basmati varieties by Pakistan poses a **threat to India's dominance in key export markets**, especially in the **European Union** and the United Kingdom.
  - **Pakistan holds an 85% share of the EU-UK market** due to its cheaper currency, allowing it to dominate these markets.
- However, **India maintains dominance in markets such as Iran, Saudi Arabia, and other West Asian countries,** where consumers prefer **parboiled rice** with harder grains that are less susceptible to breakage during cooking.

Indian Agricultural Research Institute

- The **Indian Agricultural Research Institute (IARI)** is India's largest and foremost institute in research, higher education, and training in agricultural sciences.
- It played a pivotal role in the **Green Revolution,** contributing significantly to scientific advancements and the development of appropriate agricultural technologies.
- Established in 1905 in the village of Pusa in north Bihar, it was relocated to New Delhi in 1936 after a devastating earthquake.
- The administrative control of the IARI is vested with the **Indian Council of Agricultural Research (ICAR),** an autonomous organization established under the **Societies Registration Act, of 1860.**

What is the Direct Seeded Rice (DSR) Technique?

- **About:**
  - Direct seeded rice (DSR) is a method of rice cultivation where **seeds are sown directly in the main field,** bypassing the traditional nursery raising and transplanting process.
- **Advantages of DSR:**
  - **Labour and Cost Savings:**
    - Eliminates the **need for labour-intensive nursery** raising and transplanting, reducing overall production costs.
    - Reduces manual labour requirements and associated costs, potentially leading to higher yields and better returns for farmers.
  - **Water Conservation:**
    - **Reduces water consumption by approximately 40%** compared to traditional methods, minimising soil erosion and methane emissions.
    - Requires less water than traditional transplanting, making it suitable for areas facing water scarcity.
  - **Early Crop Maturity:** Crops mature **7–10 days' sooner than usual (115–120 days)**, allowing for the timely planting of successive harvests.
- **Methods of DSR:**
  - **Dry Seeding:** Seeds are sown in dry soil, suitable for areas with assured rainfall or irrigation facilities.
  - **Wet Seeding:** Seeds are sown in puddled soil, similar to conditions for transplanting, suitable for areas with assured water availability.
- **Challenges:**
  - **Weeds:**
    - Weeds pose a significant challenge to DSR due to their competitiveness and initial infestation in the absence of water layers, leading to potential yield losses ranging from 20% to 85%.
    - Shifts in weed composition and diversity from **puddled transplanted rice (PTR)** to DSR further complicate weed management strategies.
    - Weedy rice, genetically similar to cultivated rice, has become a major concern in areas where DSR is extensively practised, causing significant yield losses and quality degradation.
  - **Development of Herbicide Resistance:**
    - Increased herbicide use in DSR has led to the emergence of herbicide-resistant weed biotypes, compromising weed control efforts.
    - **Root-knot nematodes** pose a severe constraint in DSR, affecting crop yield, particularly in areas transitioning from PTR to DSR.
      - Root-knot nematodes are **plant-parasitic nematodes from the genus Meloidogyne.** They are commonly found in soil in regions with hot climates or short winters, and they can cause significant damage to various plants.
  - **Stagnant Yield:**
    - Reports indicate yield decline in DSR, attributed to **soil sickness, plant autotoxicity, and continuous cultivation** without proper rotation.

Note:

- **Lodging:**
  - DSR is more prone to lodging compared to the puddled transplanting system (PTR), **affecting crop quality and harvest efficiency,** necessitating the preference for lodging-resistant cultivars.
- **Diseases and Insect Pests:**
  - DSR is susceptible to various diseases such as **rice blast and sheath blight,** as well as insect pests, compromising crop health and yield potential.
- **Other Challenges:**
  - Challenges such as exposure of rice seeds to birds and rats, adverse effects of sudden rain after seeding, and uneven crop stand further add to the complexities of DSR cultivation.

➢ **Possible solutions:**

- Integrated and systematic weed monitoring programme. **Biocide** use for nematode control.
- Hill seeding, lodging resistant cultivars can help to overcome lodging.
- Integrated management as well as bio-technological and genetic approaches may help resolve insect, pest and disease issues.

➢ **Industry Perspective:**

- Recognized as a technological advancement in rice cultivation, creating opportunities for businesses involved in seeds, fertilizers, pesticides, and farm machinery.
- Aligns with global sustainability goals, appealing to environmentally conscious stakeholders.
- Economic viability for farmers and the agricultural value chain is evaluated.

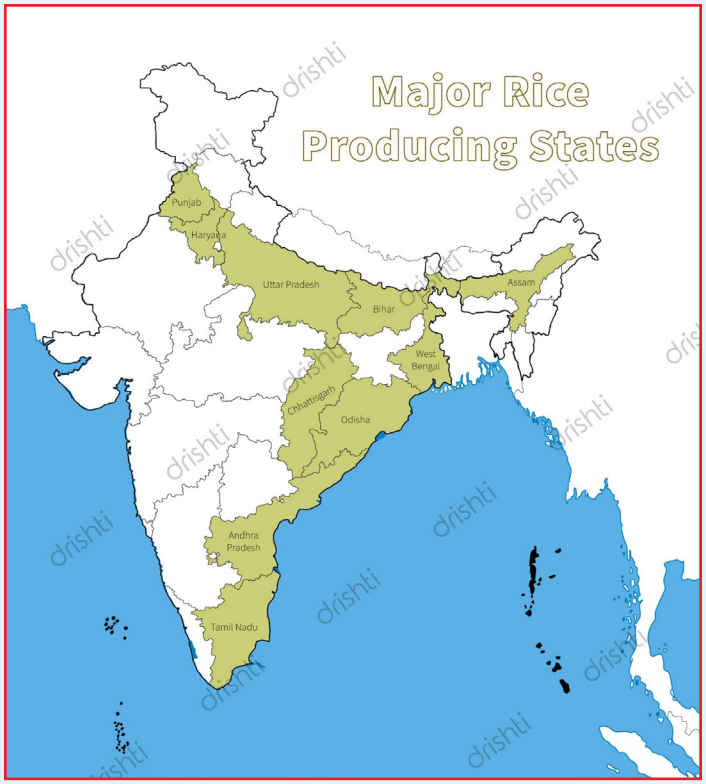
➢ **Government Support and Policies:**

- Support from government policies and procurement systems is crucial.
- Synergies between Central and state government policies are needed for effective transition to DSR.

Note:

➢ FSII is an industry body of the R&D-based plant science industry, engaged in the production of high-performance quality seeds for food, feed and fibre in India.

Rice:



Note:

- **Temperature:** Between 22-32°C with high humidity.
- **Rainfall:** Around 150-300 cm.
- **Soil Type:** Deep clayey and loamy soil.
- **Top Rice Producing States:** West Bengal, Punjab, Uttar Pradesh, Andhra Pradesh, and Bihar.
- It is the **staple food crop of the majority** of Indian people.
- India is the **second largest producer of rice in the world after China.**
- In states like **Assam, West Bengal and Odisha,** three crops of paddy are grown in a year. These are **Aus, Aman and Boro.**
- National Food Security Mission, Hybrid Rice Seed Production and Rashtriya Krishi Vikas Yojana are few government initiatives to support rice cultivation.

NABARD to Launch Fund for Agri-startups

Why in News?

The National Bank for Agriculture and Rural Development (NABARD) plans to introduce a Rs. 1,000-crore fund to support technology-driven agricultural startups and rural enterprises, with an additional Rs. 750 crore earmarked for **pre-seed investments** in untested ideas, emphasising the need to foster **innovative solutions.**

- It aims to **redirect agricultural funding from traditional farmers to new players** with innovative technologies, aiming to shift focus from production credit to investment credit.

What are the Agri Startups and Associated Challenges?

- **About:**
  - An agricultural startup, or agri startup, is a young company or business venture that **focuses on developing innovative solutions, technologies,** or business models to address **challenges and improve efficiency in the agricultural sector.**
- **Services Offered by Agritech Startups:**
  - **Smart Agriculture Promotion:** Providing information on crop yields, rainfall patterns, pest infestation, and soil nutrition.
  - **Farming as a Service:** For example, EM3 Agri Services offers farming services and machinery rentals to farmers on a pay-for-use basis.
  - **Big Data Analytics:** Developing **farm-specific, data-driven diagnostics** to enhance soil and crop health, thereby increasing productivity and farmer income. This often involves the use of Artificial Intelligence, among other technologies.
- **Challenges:**
  - **Business Model:** Agri-startups often prioritise independent production and marketing, neglecting broader value chain challenges, and hindering scaling beyond initial success.
  - **Lack of Seed Fund:** Agri-startups from modest beginnings require funding and mentorship to validate ideas, develop minimum viable product (MVP), and create viable business plans, making small grant opportunities insufficient.
  - **Incubators' Competence:** Agribusiness incubators, based in agricultural universities and research institutions, are in the early stages and need a network of professionals with diverse expertise.
  - **Limited Knowledge of Available Technology:** Budding entrepreneurs lack awareness or connection to commercially viable agricultural technologies, including digital ones, offered by research organisations.
- **Other Initiatives by the Government:**
  - Digital Agriculture Mission (DAM), 2021
  - Innovation and Agri-Entrepreneurship Development Programme, under Rashtriya Krishi Vikas Yojana (RKVY)
  - Priority Sector lending for Agri-startups.
  - NIDHI Seed Support Program (NIDHI-SSP), under the Department of Science & Technology (DST)

Note:

Nabventures: Fund for Rural Agriculture Startup

- **About:**
  - The government plans to launch a Rs **750 crore** Blended Capital fund to support agricultural start-ups and rural enterprises, aiming to enhance investments and efficiency in the sector.
    - According to the Organisation for Economic Co-operation and Development (OECD), **blended finance** is the strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries.
  - **Objective:**
    - The goal is to **support pre-seed startups** with unproven ideas or uncertain growth potential, particularly those hindered by insufficient equity for scaling.
    - Start-ups that fall under agritech, animal husbandry, fisheries, food processing, and biotechnology would benefit from it.
- **Supervision:**
  - To finance agri-based start-ups and rural enterprises, blended capital support will be rolled out by the **Ministry of Agriculture** and managed by Nabventures, a wholly-owned subsidiary of NABARD.

India-EFTA Trade Deal

Why in News?

India and the European Free Trade Association (EFTA) recently signed the Trade and Economic Partnership Agreement (TEPA).

- India previously rejected the inclusion of "data exclusivity" clauses in the agreement which would have restricted Indian pharmaceutical companies from producing generic drugs.
- Now, India and EFTA agreed to **exclude the most "sensitive" agricultural products** and gold imports from the pact.

What are the Key Highlights of the TEPA?

- **About:** The India-EFTA trade deal was finalised a decade after initial negotiations broke down in **2013** due to disagreements.
  - Recent geopolitical changes and a **shared goal to reduce dependence on China** facilitated the agreement.
  - TEPA comprises 14 chapters with a main focus on market access related to **goods, rules of origin, trade facilitation, trade remedies, sanitary and phytosanitary measures,** technical barriers to trade, investment promotion, market access on services, intellectual property rights, trade and sustainable development and other legal and horizontal provisions.
- **Key Points:**
  - **EFTA Commitments:** To increase foreign direct investments in India by USD 100 billion over 15 years. The investments do not cover foreign portfolio investment.
    - Target to generate **1 million direct jobs in India** through these investments.
    - Commitments related to Intellectual Property Rights in TEPA are at the Trade-Related Aspects of the Intellectual Property Rights level.
  - **Tariff Offers:** EFTA offers **92.2%** of tariff lines covering 99.6% of India's exports.
    - India offers **82.7%** of tariff lines covering 95.3% of EFTA exports.
    - **India excludes sectors like dairy, soya, coal,** and sensitive agricultural products from tariff concessions.
  - **Mutual Recognition:** TEPA has provisions for Mutual Recognition Agreements in Professional Services like **nursing, chartered accountants, architects** etc.
  - **Market Integration:** TEPA provides an opportunity for India to integrate into EU markets.
    - Over 40% of Switzerland's global services exports are to the EU.
    - **Indian companies can look to Switzerland as a base for extending its market reach to the EU**.
  - **Services Offer From EFTA:** Services offered by EFTA include better access through digital delivery of Services (Mode 1), commercial presence (Mode 3) and improved commitments and certainty for entry and temporary stay of key personnel (Mode 4).

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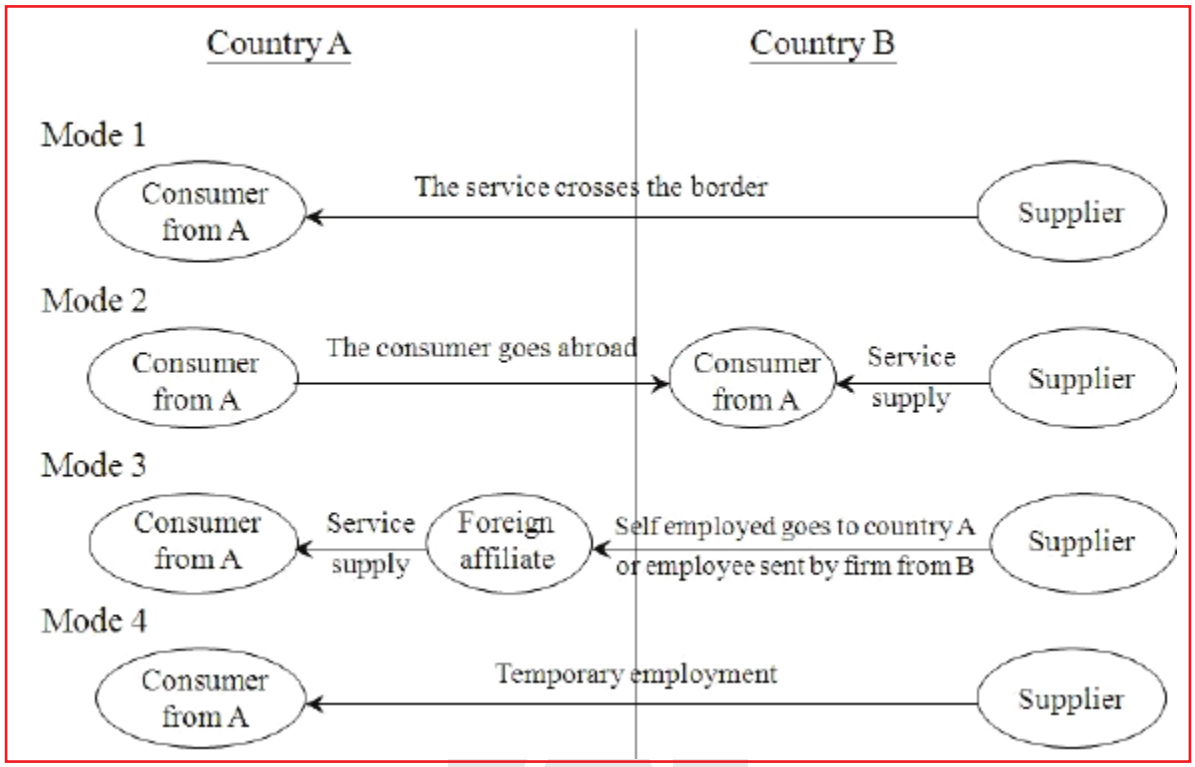


What is the European Free Trade Association?

- **About:** The EFTA is the intergovernmental organisation of **Iceland, Liechtenstein, Norway and Switzerland** (all four are not a part of the EU).
  - It was founded by the **Stockholm Convention** in 1960.
  - It aims to promote free trade and economic integration to the benefit of its four Member States and their trading partners around the globe.
- **India and EFTA:** India is the EFTA's **5th-largest trading partner** after the European Union, the United States, Britain and China.
  - Two-way trade between India and EFTA was USD 18.65 billion in 2022-23, with a trade deficit of **USD 14.8 billion** for India.
    - Switzerland is India's largest trading partner in this bloc of nations, followed by Norway.
  - The biggest exports to India were pharmaceutical items (11.4%) and machinery (17.5%), while organic chemicals (27.5%) made up the majority of EFTA imports.

Note: TEPA is the 4th major deal signed by India to promote trade and economic cooperation in the last 3 years. The others are with **Australia, Mauritius and the UAE**.

How are India's Relations with EFTA Nations?

- **India and Norway**
  - India and Norway have been enjoying a cordial and friendly relationship since the establishment of relations in **1947**.
  - Norway's first Consulates in India opened in **Kolkata and Mumbai** in 1845 and 1857, respectively.
  - Norway has supported India's membership to export control regimes the **Missile Technology Control Regime (MTCR),** the Wassenaar Arrangement (WA) and the Australia Group (AG).
  - In 2020, the India-Norway Task Force on Blue Economy for Sustainable Development was inaugurated jointly by both countries
    - HIMADRI, India's first research station is located at the International Arctic Research base, NyAlesund, Svalbard, Norway.
- **India and Switzerland Relations:**
  - Switzerland established diplomatic relations with India soon after Independence. A Treaty of Friendship between India and Switzerland was signed at New Delhi on **14th August 1948.**
  - India is Switzerland's **4th-largest trading partner in Asia** and the largest in South Asia.

Note:

- More than 300 Swiss companies such as Nestle, Holcim, Sulzer, and Novartis operate in India, while Indian IT majors TCS, Infosys and HCL work in Switzerland.

➢ **India and Iceland**

- India and Iceland established diplomatic relations in **1972** and have strengthened their ties since 2005 with high-level visits and exchanges.
- Iceland was the first Nordic country to publicly extend support to India's candidature for permanent membership in the United Nations Security Council (UNSC).
- India and Iceland recently entered into a MoU to explore collaboration in renewable energy, green hydrogen, decarbonization initiatives, and geothermal energy.

➢ **India and Liechtenstein**

- India and Liechtenstein established diplomatic relations in **1993**
- As per RBI's data, the FDI inflow from Liechtenstein amounts to **USD 44.68 million** from April 2000 to March 2020.

■■■

Note:

International Relations

Highlights

Order of the Druk Gyalpo

Why in News?

Recently, the Prime Minister of India received Bhutan's highest civilian award, the **'Order of the Druk Gyalpo'**, during his two-day State visit to Bhutan.

- He is the **first foreign Head** of the Government to receive the honour.
- India and Bhutan have also exchanged several MoUs and signed agreements in the fields of **energy, trade, digital connectivity, space and agriculture**, and finalised the MoU on the establishment of rail links between the two nations.

Note:

What is the 'Order of the Druk Gyalpo' Award?

- **About:**
  - The Order of the Druk Gyalpo stands as **Bhutan's most esteemed civilian accolade**, reserved for individuals who have **demonstrated exceptional contributions** to society, embodying values of service, integrity, and leadership.
  - Recipients of this prestigious award are carefully selected based on their outstanding accomplishments and positive impact on society.
  - Their contributions are assessed in alignment with **Bhutanese values, emphasising holistic development**, cultural preservation, and regional harmony.
- **Accolade on Indian PM:**
  - Indian PM's selection as the **first foreign Head of Government to receive this honour** underlined the **strong bilateral ties between the two countries.**
  - The award underscores his leadership, characterised by an unwavering commitment to progress, which aligns **closely with Bhutan's national vision of achieving Self-Reliance.**
  - Indian PM has emerged as a figure of destiny, transforming the ancient civilisation of India into a **dynamic centre of technology** and innovation.
    - His commitment to safeguarding the environment and investing in **renewable energy** makes India's progress truly well-rounded.

Note:

What are the Key Pacts Signed by India and Bhutan?

- **Establishment of Rail Links:**
  - An MoU was finalised on the establishment of rail links between India and Bhutan, including the **Kokrajhar-Gelephu rail link** and **Banarhat-Samtse rail link.**
- **Petroleum, Oil, Lubricants (POL):**
  - An agreement was made for the general supply of POL and related products **from India to Bhutan**, facilitating supply through **agreed entry/exit points.**
- **Recognition of Bhutan Food And Drug Authority (BFDA):**
  - An agreement was reached for the recognition of official control exercised by BFDA by the **Food Safety and Standards Authority Of India (FSSAI)**, promoting ease of doing business and reducing compliance costs.
- **Cooperation in Energy Efficiency and Energy Conservation:**
  - An MoU aimed to assist Bhutan in enhancing energy efficiency in the household sector through various measures such as promoting a **star labelling program and institutionalising training of energy auditors.**
- **Pharmacopoeia, Vigilance, and Testing of Medicinal Products:**
  - This MoU aimed to enhance cooperation and exchange information in the regulation of medicines, allowing for the acceptance of Indian Pharmacopoeia by Bhutan and the **supply of generic medicines at affordable prices.**
- **Joint Plan of Action (JPOA) on Space Cooperation:**
  - A concrete roadmap was established for further developing space cooperation through exchange programs and training.
- **Digital Connectivity**:
  - Both countries signed for renewal of the MoU on **Peering Arrangement between the National Knowledge Network of India (NKN) and the Druk Research And Education Network of Bhutan.**
  - This MoU aims to enhance **digital connectivity between India and Bhutan** and will benefit the scholars and research institutions of Bhutan.

What are the Implications of Indian PM's Visit to Bhutan at a Time of Regional Challenges?

- **Strengthening Bilateral Ties:**
  - The visit underscores **India's commitment to strengthening its bilateral relationship** with Bhutan, especially during a period of regional uncertainty and challenges.
  - This reaffirms the enduring friendship between the two nations and emphasises **mutual support in the face of external pressures.**
    - The announcement of India's doubling of support for **Bhutan's Five Year Plan, from Rs 5,000 crore to Rs 10,000 crore**, was significant in this regard.
- **Counterbalancing Chinese Influence:**
  - Against the backdrop of China's increasing engagement with Bhutan, the Indian PM's visit serves to r**einforce India's presence and influence in the region.**
  - By showcasing support for Bhutan's development and security interests, India aims to counterbalance any **attempts by China to expand its influence in Bhutan.**
- **Enhancing Strategic Cooperation:**
  - The visit included discussions on strategic cooperation, including defence and security cooperation, to address common regional challenges such as border security and terrorism.
  - Strengthening cooperation in these areas can contribute to regional stability and security.
- **Promoting Economic Partnerships:**
  - The visit has also focused on promoting economic partnerships between India and Bhutan. This could involve initiatives to boost trade, investment, and infrastructure development, which are essential for both countries' economic growth and development.
- **Addressing Regional Security Concerns:**
  - Given the geopolitical dynamics in South Asia, the Indian PM's visit has addressed regional security concerns, including **cross-border terrorism** and the need for cooperation among neighbouring countries to maintain peace and stability in the region.

India's Push for Security Council Reform: The G4 Model

Why in News?

Participating in the **Intergovernmental Negotiations on Security Council Reform,** India has presented a detailed model on behalf of the **G4 nations** for **United Nations Security Council Reform.**

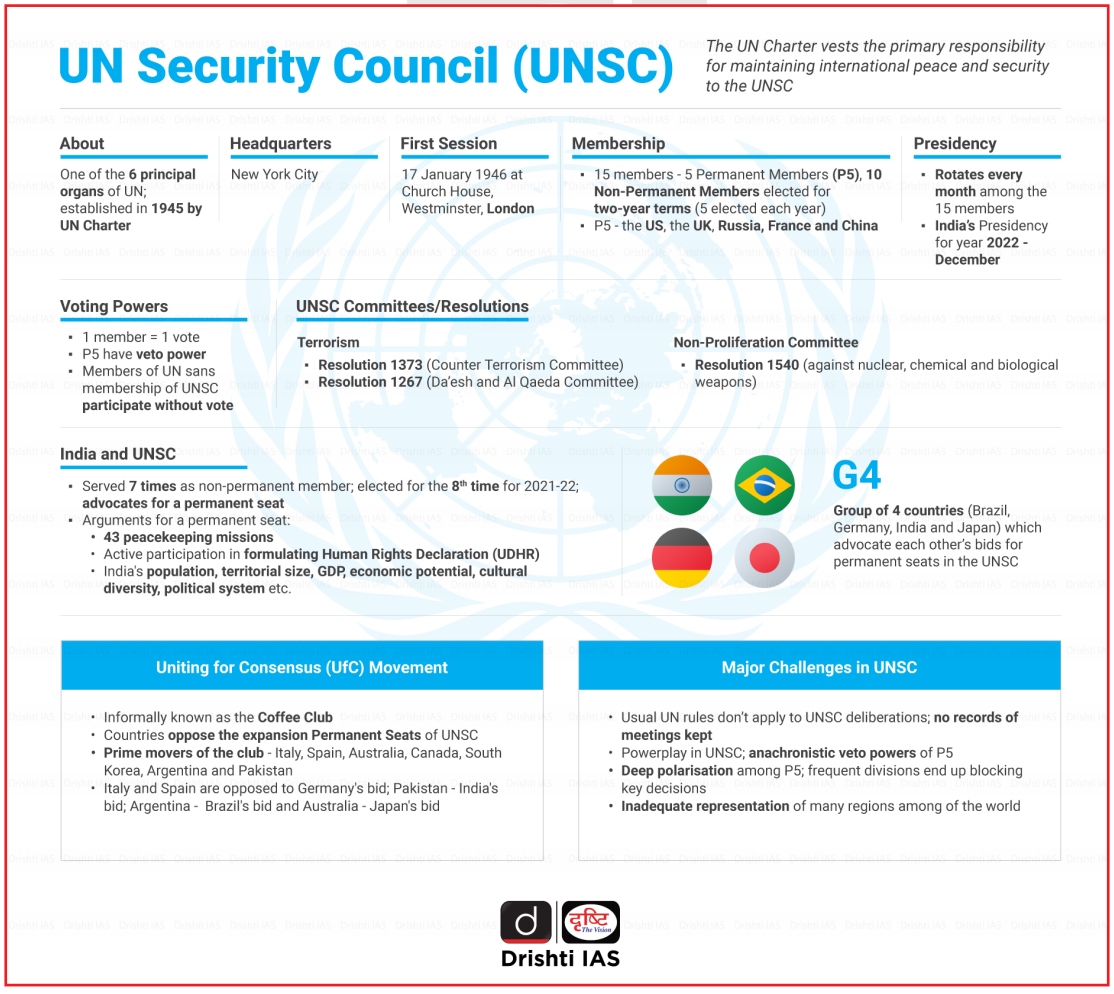
Note:

- The model includes new permanent members elected democratically by the **UN General Assembly** and shows flexibility on the veto issue.
- The G4 (Brazil, Germany, India and Japan) was created in 2004 and has been promoting Security Council reform.

What are the Key Features of the G4 Proposed Model?

- **Addressing Under-representation:** The model highlights the **"glaring under-representation and un-representation"** of key regions in the Council's current composition, which hampers its legitimacy and effectiveness.
- **Membership Expansion:** The G4 model advocates for increasing the Security Council's membership from the **current 15 to 25-26 members**.
  - This expansion includes **adding 6 permanent and 4 or 5 non-permanent** members.
  - Two new permanent members each are proposed from **African states and Asia Pacific states, one from Latin American and Caribbean states**, and one from Western European and Other states.
- **Flexibility on Veto**: In a departure from the existing framework where only the five permanent members hold veto powers, the G4 model offers flexibility on the **veto issue**.
  - New permanent members would refrain from exercising the veto until a decision on the matter is taken during a review process, demonstrating a willingness to engage in constructive negotiations.
- **Democratic and Inclusive Election:** The proposal emphasizes that the decision on which member states will occupy the new permanent seats will be made through a **democratic and inclusive election by the UN General Assembly.**

What is the United Nations Security Council?



Note:

Why does the UN Security Council Need to be Reformed?

- **Representation and Legitimacy:** The Security Council plays a crucial role in peacekeeping and conflict resolution, with binding decisions that impact all member states.
  - To ensure these decisions are respected and implemented universally, the Council must possess the necessary authority and legitimacy, which requires **representation reflecting the current global landscape.**
- **Outdated Composition:** The current composition of the Security Council, based on the geopolitical situation of **1945** and expanded marginally in **1963/65,** no longer accurately represents the world stage.
  - With 142 new countries joining the United Nations since its inception, regions like **Africa, Asia, Latin America, and the Caribbean** lack adequate representation, necessitating adjustments to the Council's composition.
- **Recognition of Contributions:** The UN Charter acknowledges that countries making substantial contributions to the organisation should have a role in the Security Council.
  - This recognition underscores the candidacy of nations like **India, Germany and Japan for new permanent seats**, reflecting their meaningful contributions to the UN's mission.
- **Risk of Alternative Decision-Making Forums:** Without reform, there's a risk that decision-making processes could shift to **alternative forums**, **potentially diluting the Security Council's effectiveness.**
  - Such competition for influence is counterproductive and not in the collective interest of member states.
- **Misuse of Veto Power:** The utilisation of veto power has consistently faced **criticism** from numerous experts and the majority of states, labelling it as a **"self-selected group of privileged nations"** that lacks democratic principles and hinders the Council's ability to take essential decisions if it conflicts with the interests of any of the P-5 members.
  - In today's global security landscape, relying on **exclusive decision-making frameworks is deemed unsuitable.**

What is the Procedure of UN Security Council Reforms?

UN Security Council reform requires an amendment to the Charter of the United Nations. The relevant procedure as set out in **Article 108** involves a two-stage process:

- **First Stage:** The General Assembly, where each of the 193 member states holds one vote, must endorse the **reform with a two-thirds majority,** equivalent to at least 128 states.
  - This stage **does not grant the right of veto,** as per Article 27 of the Charter.
- **Second Stage:** Upon approval in the first stage, the United Nations Charter, considered an international treaty, undergoes amendment.
  - This amended Charter requires ratification by at **least two-thirds of the member states, including all five permanent Security Council members,** adhering to their respective national procedures.
  - In this stage, the ratification process can be influenced by the parliaments of the permanent members, potentially affecting the entry into force of the amended Charter.

Note: A negative vote from permanent members in the General Assembly does not prevent them from later ratifying the amended Charter.

- For instance, during the 1963 vote to enlarge the Security Council, **only one permanent member voted in favour**.
- However, within 18 months by 1965, all five permanent members had ratified the amended Charter.

India Bhutan Relations

Why in News?

Recently, Bhutan's Prime Minister visited India, where India held wide-ranging talks with Bhutan and signed a slew of agreements **between India and Bhutan.**

- The close and cordial ties between India and Bhutan are deeply rooted in trust, goodwill, and shared values, permeating through all levels of engagement.
- This enduring friendship serves as a cornerstone for mutual prosperity and regional stability in South Asia.

Note: In the Interim Budget 2024-25, the Ministry of External Affairs (MEA) has been allocated **Rs 22,154 crore for fiscal year 2024-25.** India's 'Neighbourhood First' policy is reflected in the largest share of aid portfolio granted to Bhutan with an allocation of Rs 2,068 crore against Rs 2,400 crore in 2023-24.

What are the Key Highlights of the India-Bhutan Bilateral Talks?

- **Petroleum Agreement:**
  - Both countries signed an agreement on the supply of petroleum products to ensure a reliable and sustained supply from India to Bhutan, fostering economic cooperation and growth in the hydrocarbon sector.
- **Food Safety Collaboration:**
  - Bhutan's Food and Drug Authority and **India's** Food Safety and Standards Authority (FSSAI) signed an agreement to enhance cooperation in **food safety measures**.
  - It will facilitate trade between the two countries by ensuring compliance with food safety standards and reducing compliance costs.
- **Energy Efficiency and Conservation:**
  - Both countries signed an MoU on energy efficiency and conservation that demonstrates a **commitment to sustainable development.**
  - India aims to assist **Bhutan in enhancing energy efficiency** in households, promoting the use of energy-efficient appliances, and developing standards and labelling schemes.
- **Border Dispute Resolution:**
  - The Bhutanese Prime Minister's visit coincides with ongoing discussions between **China and Bhutan to resolve their border dispute**, which has implications for regional security, particularly in the Doklam region.
  - In August 2023, China and Bhutan agreed on a plan to **address their border disagreement.**
  - This was followed by the formal signing of the agreement in October 2021.
    - This agreement came four years after a conflict between India and China in Doklam, sparked by **China's attempt to construct a road in the area in 2017.**
- **Bhutan's Regional Economic Hub in Gelephu:**
  - Bhutan's plans for a regional economic hub in Gelephu, mark a significant step towards regional development and connectivity.
    - The project, initiated by Bhutan's King in December 2023, aims to establish the **"Gelephu Mindfulness City" (GMC) spanning 1,000 square kilometres.** Unlike traditional financial hubs characterised by skyscrapers, Gelephu will prioritise sustainable development, focusing on **non-polluting industries** such as IT, education, hospitality, and healthcare.
    - Positioned at the crossroads of India's "Act East" policy and the emerging connectivity initiatives spanning Southeast Asia and the Indo-Pacific region, Gelephu holds strategic significance in fostering economic integration and trade facilitation.

What is the Significance of Bhutan for India?

- **Strategic Importance:**
  - Bhutan shares its borders with **India and China,** and its strategic location makes it an important **buffer state for India's security interests.**
  - India has provided Bhutan with assistance in areas such as defence, infrastructure, and communication, which has helped to maintain Bhutan's sovereignty and territorial integrity.
  - India has helped Bhutan build and maintain its border infrastructure, such as roads and bridges, to strengthen its defence capabilities and ensure its territorial integrity.
    - In 2017, during the Doklam standoff between India and China, Bhutan played a crucial role in allowing Indian troops to enter its territory to resist Chinese incursions.

Note:

- **Economic Importance:**
  - **India is Bhutan's largest trading partner** and Bhutan's major export destination.
  - Bhutan's hydropower potential is a significant source of revenue for the country, and India has been instrumental in assisting Bhutan in developing its hydropower projects.
- **Cultural Importance:**
  - Bhutan and India share strong cultural ties, as both countries are predominantly Buddhist.
  - India has assisted Bhutan in preserving its cultural heritage, and many Bhutanese students come to India for higher education.
- **Environmental Importance:**
  - Bhutan is one of the few countries in the world that has pledged to remain **carbon-neutral,** and India has been a key partner in helping Bhutan achieve this goal.
  - India has provided assistance to Bhutan in areas such as **Renewable energy, forest conservation, and sustainable tourism.**

What are the Challenges in the India-Bhutan Relations?

- **China's Growing Influence:**
  - China's increasing presence in Bhutan, particularly **along the disputed border** between Bhutan and China, has raised concerns in India. India has been Bhutan's closest ally and has played a key role in protecting Bhutan's sovereignty and security.
  - China and Bhutan have not established diplomatic relations yet, but have **maintained friendly exchanges.**
- **Border Disputes:**
  - India and Bhutan share a **699 km long border,** which has been largely peaceful.
  - However, there have been some incidents of border incursions by Chinese forces in recent years.
    - The **Doklam standoff in 2017** was a major flashpoint in the India-China-Bhutan tri-junction. Any escalation of such disputes could strain India-Bhutan relations.
- **Hydropower Projects:**
  - Bhutan's hydropower sector is a key pillar of its economy, and India has been a major partner in its development.
    - However, there have been **concerns in Bhutan over the terms of some of the hydropower projects**, which have been seen as too favourable to India.
    - This has led to some public opposition in Bhutan to Indian involvement in the sector.
- **Trade Issues:**
  - India is Bhutan's largest trading partner, accounting for over **80% of Bhutan's total imports and exports.** However, there have been some concerns in Bhutan over the trade imbalance, with Bhutan importing more from India than it exports.
    - Bhutan has been seeking greater access to the Indian market for its products, which could help to reduce the **Trade Deficit.**

What are the Key Facts Related to Bhutan?

- **About:**
  - Bhutan is **nestled between India and China** and is a landlocked country. Mountains and valleys dominate the landscape of Bhutan.
    - **Thimphu is the Capital City** of Butan.
  - Bhutan became a democracy in 2008 after the first democratic elections were held in the country. **The King of Bhutan is the Head of State.**
  - It is named the 'Kingdom of Bhutan'. The Bhutanese name is Druk Gyal Khap, which means the **'Land of the Thunder Dragon'.**
- **River:**
  - The longest river in Bhutan is the Manas River with over 376 km in length.
    - The Manas River is transboundary in the Himalayan foothills between southern Bhutan and India.

■■■

Note:

Social Issues

Highlights

- *Levels and Trends in Child Mortality*
- *Challenges Faced by the Gig Workers*
- *Snakebite Envenoming*
- *Abortion*
- *Enhancing Accessibility for Persons with Disabilities*
- *World Poverty Clock*
- *Women, Business and the Law 2024*
- *Growing Obesity in India*
- *Rare Disease Day 2024*
- *Marriage Can't be Grounds to Sack Women from the Military*

Human Development Report 2023-24

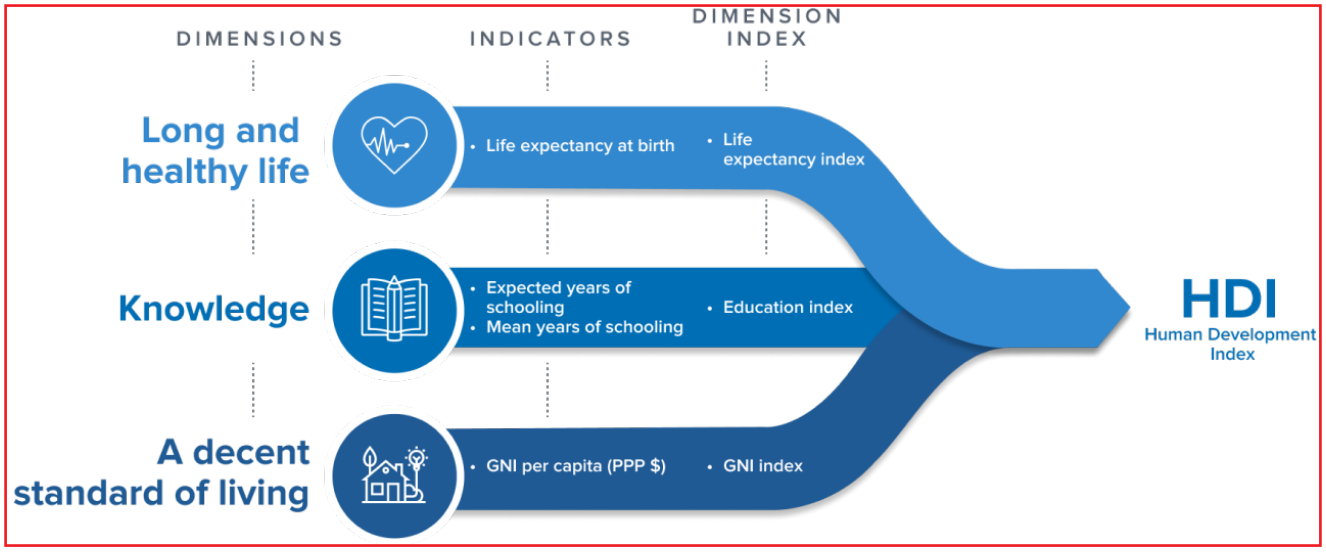
Why in News?

According to the 2023-24 **Human Development Report (HDR)**, titled ***'Breaking the Gridlock: Reimagining Cooperation in a Polarised World,'*** India ranks 134 on the global Human Development Index (HDI). Switzerland has been ranked number one.

- The report has been released by the **United Nations Development Programme (UNDP)**.

What is the Human Development Report?

- **About:**
  - **Human Development Reports (HDRs)** have been released since 1990 and have explored different themes through the human development approach.
  - The reports are produced by the Human Development Report Office for the United Nations Development Programme (UNDP).
- **Human Development Index:**
  - HDI is a composite index that measures average achievement in human development taking into **account three indicators:**
    - **Life expectancy at birth** (**Sustainable Development Goal (SDG)** 3),
    - **Expected years of schooling** (SDG 4.3),
      - **Mean years of schooling** (SDG 4.4),
    - **Gross national income** (GNI) (SDG 8.5).



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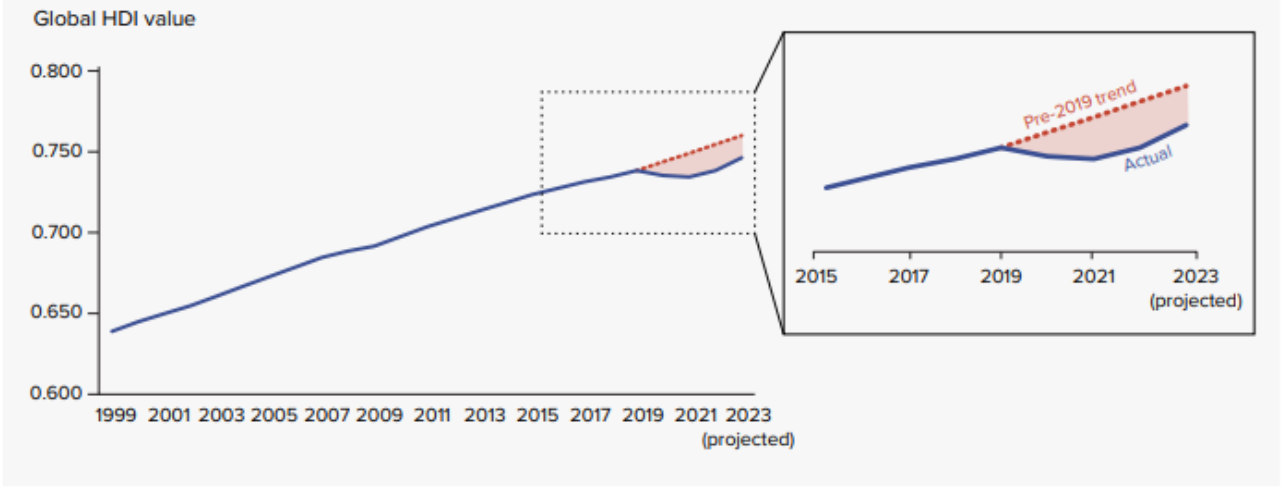
What are the Key Highlights of the Report?

- **Performer:**
  - **Top Three Countries (Scores):** Switzerland (0.967), Norway (0.966) and Iceland (0.959).
  - **Bottom Three Countries:** Somalia (0.380), South Sudan (0.381), Central African Republic (0.387).
  - **Bigger Economies:** USA (0.927), UK (0.889), Japan (0.878), Russia (0.821).
  - **Countries Not Ranked in Index:** The **Democratic People's Republic of Korea** (North Korea) and **Monaco.**
- **Unprecedented Levels of Growth Disparity:**
  - The rich countries experienced unprecedented development. But half of the world's poorest nations continued to **languish below their pre-Covid-19 crisis levels.**
    - The two-decade trend of **steadily reducing inequalities between wealthy and poor nations** is now in reverse.
  - While HDI is projected to reach record highs in 2023 after declines in 2020 and 2021, there is a **stark contrast in development levels between rich and poor nations**.
- **Democracy Paradox:**
  - There is an emerging "democracy paradox", with most of those surveyed expressing **support for democracy but also endorsing leaders who may undermine democratic principles.**
  - This paradox, coupled with a **sense of powerlessness and a lack of control over government decisions**, has fuelled political polarisation and inward-looking policy approaches.
- **Global Inequalities and Widening Human Development Gap:**
  - Global inequalities have been **compounded by substantial economic concentration** – almost 40% of global trade in goods is concentrated in **three or fewer countries.**
  - In 2021, the market capitalisation of each of the three largest tech companies in the world surpassed the **Gross Domestic Product (GDP)** of more than 90% of countries that year, the report said.
- **Indian Overview:**
  - **Performance at Various Indicators:** India's **average life expectancy** reached 67.7 years in 2022, up from 62.7 years the previous year.
    - India's **Gross National Income (GNI)** per capita has surged to USD 6951, marking a 6.3% increase over the span of 12 months.
    - There is a rise in **expected years of schooling, reaching 12.6 per individual.**
  - **HDI Score:** India attained an HDI score of 0.644 in 2022, positioning it at **134 out of 193 countries** in the UN's 2023-24 report.
    - This categorises India under **'medium human development.'**
    - With India's HDI in 1990 standing at **0.434, the 2022 score reflects a positive change of 48.4%.**
  - **Notable Achievements**: There is a 9.1-year increase in life expectancy at birth, a rise of 4.6 years in expected years of schooling, and an increase of **3.8 years in mean years of schooling.**
    - India's strides in reducing gender inequality, highlighted a **Gender Inequality Index (GII) of 0.437**, surpassing the global average.
      - On the **GII 2022** list, which evaluates countries based on reproductive health, empowerment, and labour market participation, **India ranks 108 out of 166 nations in 2022.**
- **Performance of India's Neighbour:**
  - **Sri Lanka** has been ranked much **ahead at 78**, while **China is ranked 75,** both categorised under the **High Human Development category**.
    - India also ranks below Bhutan which stands at **125 and Bangladesh**, which is in the 129th position. India, Bhutan and Bangladesh are all in the Medium Human Development category.
  - **Nepal (146) and Pakistan (164) have been ranked lower than India.**

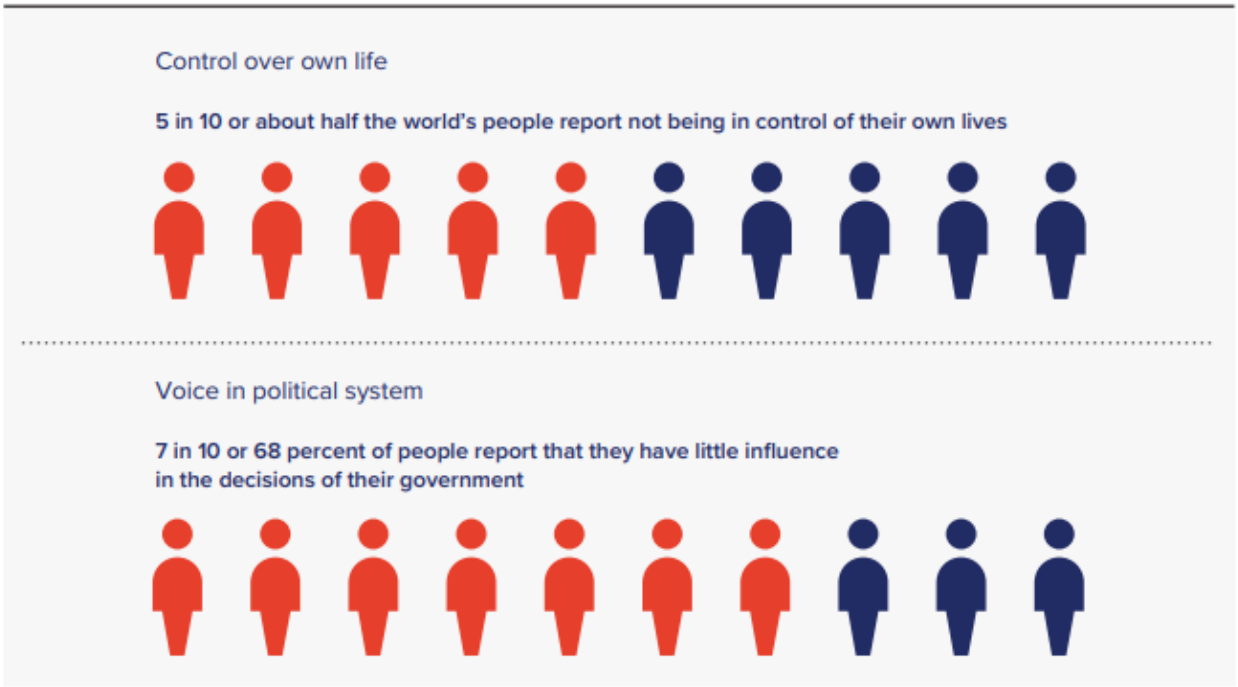
Note:

A permanent shift in the Human Development Index (HDI) trajectory?



Note: The global HDI value for 2023 is a projection. The pre-2019 trend is based on the evolution of the global HDI value in the previous 20 years.

Figure S.7 Agency gaps in collective action are higher than those in control over one's own life



Note: Agency is the ability of people to act as agents who can do effective things based on their commitments (Sen 2013). It is proxied by two indicators: the share of the population that reported feeling in control over their lives (measured on a scale of 1–10, where 1–3 indicates an acute agency gap, 4–7 indicates a moderate agency gap and 8–10 indicates no agency gap) and the share of the population that reported feeling that their voice is heard in the political system (those who responded "A great deal" or "A lot"). Data are computed using microdata and equal weights across countries.
Source: Human Development Report Office based on data from wave 7 (2017–2022) of the World Values Survey (Inglehart and others 2022).

Note:

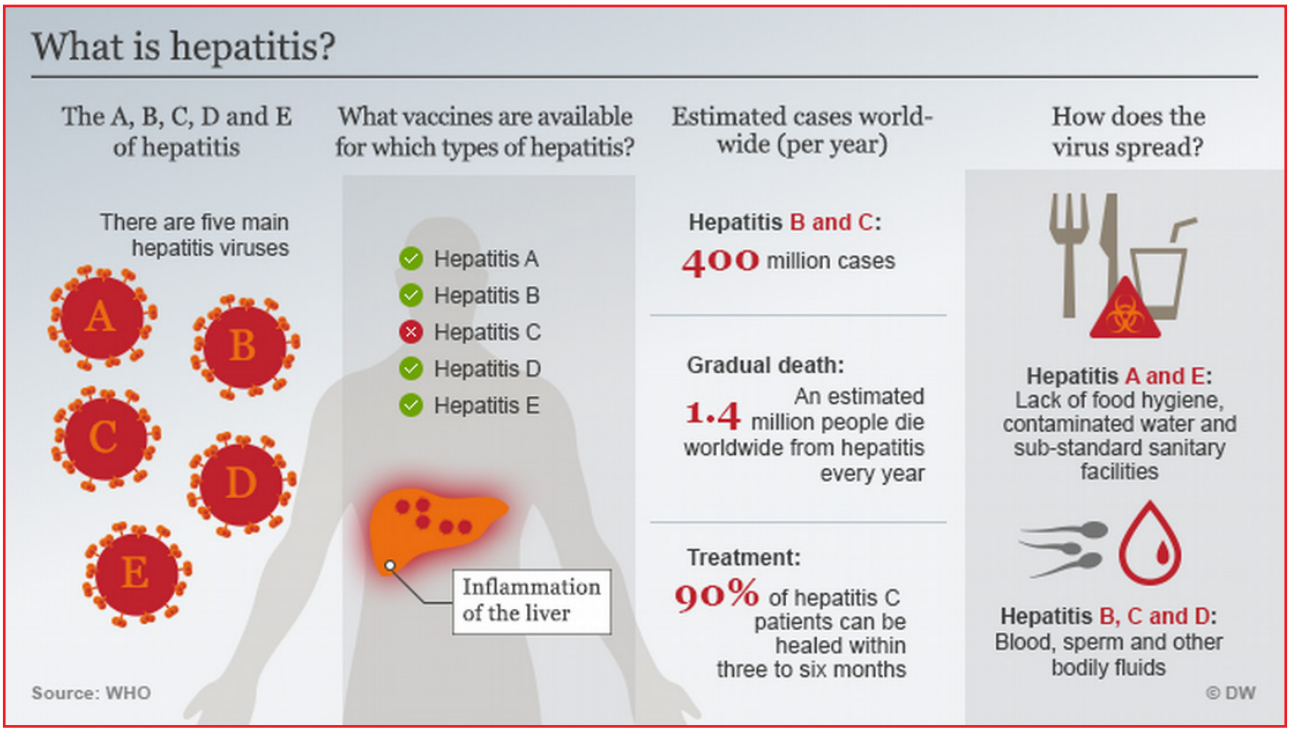
Hepatitis B: A Public Health Concern In India

Why in News?

A recent study by Sir Ganga Ram Hospital, New Delhi, indicates that public awareness and knowledge regarding Hepatitis B, a potentially fatal disease leading to liver cirrhosis and cancer, is insufficient in India.

What is Hepatitis?

- **About:**
  - **Hepatitis** is the **inflammation** of the **liver**, characterised by irritation or swelling of the liver cells due to various causes.
  - Liver inflammation can manifest as either acute, characterised by symptoms like **jaundice**, fever, and vomiting, or chronic, lasting over six months with no apparent symptoms.



- **Symptoms:**
  - Some individuals infected with hepatitis **may not exhibit symptoms**, but common ones include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-coloured bowel movements, joint pain, and jaundice.
- **Causes:**
  - Hepatitis is typically caused by hepatotropic viruses, including A, B, C, D, and E, although other viruses like the **varicella virus** can also lead to the disease.
    - **SARS-CoV-2**, the virus causing **Covid-19** may injure the liver too.
  - Additional causes encompass **drug and alcohol** misuse, liver fat accumulation **(fatty liver** hepatitis), or an autoimmune response where the body produces antibodies targeting the liver (autoimmune hepatitis).
- **Types of Hepatitis:**
  - **Hepatitis A virus (HAV):**
    - Hepatitis A is a liver inflammation that ranges from mild to severe, transmitted through contaminated food or water, direct contact with an infected person, and **can be prevented** with a vaccine, with most people recovering fully and gaining lifelong immunity.
  - **Hepatitis B virus (HBV):**
    - Hepatitis B is a **viral infection** that can cause acute or chronic liver disease, often transmitted from mother to child, through early childhood contact, or via sex or unsafe injections, but **can be prevented** by vaccines.
      - Hepatitis B vaccines are **highly efficacious** in preventing HBV infection when administered **before exposure** to HBV.

Note:

- **Hepatitis C virus (HCV):**
  - Hepatitis C is a **bloodborne virus** causing both acute and chronic hepatitis, with severity ranging from mild to serious, including liver cirrhosis and cancer, primarily transmitted through unsafe health care, blood transfusions, injection drug use, and sexual practices.
  - The cure rates exceeds 95% using Direct-acting antiviral medicines (DAAs), yet access to diagnosis and treatment is limited, and **no effective vaccine exists.**
- **Hepatitis D virus (HDV):**
  - Hepatitis D, a virus dependent on hepatitis B virus (HBV) for replication, affects approximately 5% of individuals with chronic HBV infection worldwide, with co-infection or super-infection more prevalent among indigenous populations, dialysis patients, and drug users, posing a severe risk to liver health including the potential for cancer or fatality.
  - Its **prevention is possible** through hepatitis B immunization, treatment efficacy remains limited.
- **Hepatitis E virus (HEV):**
  - Hepatitis E, caused by **HEV infection**, is globally prevalent, particularly in **East and South Asia**, transmitted through contaminated water, with a licensed vaccine in China and some other countries and ongoing research for additional vaccines worldwide.

➢ **Government Initiatives to Tackle Hepatitis:**
- **National Viral Hepatitis Control Program:** The National Viral Hepatitis Control Program aims to eliminate viral hepatitis as a public health threat in the country **by 2030.**
- **India's Universal Immunization Programme (UIP):** India's Universal Immunization Programme (UIP) offers free vaccination against **eleven vaccine-preventable diseases**, including Hepatitis B, **Tuberculosis**, Diphtheria, Pertussis, Tetanus, Polio, Pneumonia, Meningitis due to Haemophilus Influenzae type b (Hib), Measles, Rubella, Japanese Encephalitis (JE), and Rotavirus diarrhoea.

➢ **Global Initiatives:**
- WHO's global hepatitis strategy
- Coalition for Global Hepatitis Elimination (CGHE)
- Global Hepatitis Programme

What are the Recommendations Made by the Survey?

➢ As per the survey, only 22.7% of participants had completed the full Hepatitis B vaccination course.
- Therefore it recommends, ensuring **accessibility** and reaching all segments of the population, especially those at high risk, is crucial for effective vaccination against HBV, alongside increasing overall vaccination efforts.

➢ The survey finds that **only a quarter** of those surveyed had sufficient understanding of the disease, encompassing its transmission, impact on the liver, and the crucial role of vaccination.
- Therefore to deal with widespread misconceptions and insufficient education on Hepatitis B the need for **targeted information campaigns** to address knowledge gaps is the way out.
- For this, people should be educated on the necessity of **completing the entire vaccination** regimen for optimal effectiveness, as it is not uncommon for individuals to miss the final dose after receiving one or two doses.

➢ **It recommends educational campaigns** should target the general public, especially **women**, older individuals, those with lower education levels, and rural residents, who showed lower knowledge scores and vaccination rates in the study.

➢ It concludes that comprehensive strategies, which integrate **health literacy and vaccination coverage**, are crucial for achieving national and global HBV control targets.

Sickle Cell Disease

Why in News?

Amidst the unavailability of essential drugs to treat **Sickle Cell Disease (SCD)** at district healthcare institutions, there is growing concern about the challenges faced by people from marginalised Indigenous Tribal communities in managing the treatment of SCD.

What is Sickle-Cell Disorder?

➢ **About:**
- **Sickle Cell Disease (SCD)** is an **inherited haemoglobin disorder** characterised by a **genetic mutation** that **causes red blood cells (RBCs) to assume a sickle or crescent shape** rather than their normal round shape.

Note:

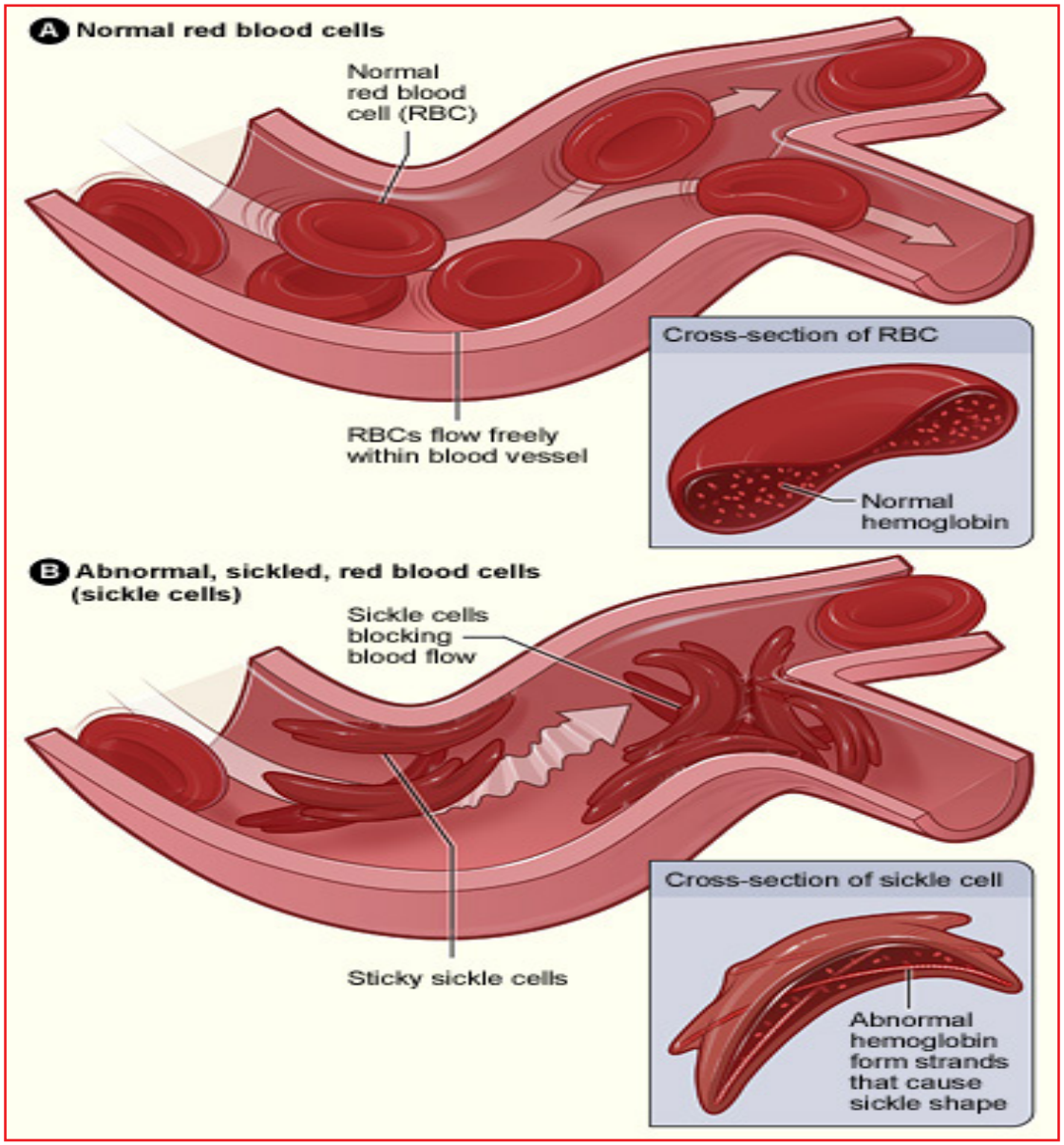
- This **abnormality** in RBCs **results in increased rigidity, impairing their ability to circulate effectively** throughout the body. Consequently, individuals with SCD often experience complications such as **anaemia, organ damage, recurrent and severe pain episodes, and a shortened lifespan**.
- As per the Ministry of Health and Family Welfare, marginalised tribal populations are most vulnerable to SCD.

➢ **Symptoms:** Symptoms of sickle cell disease can vary, but some **common symptoms** are-

- **Chronic anaemia** which leads to fatigue, weakness, and paleness.
- Painful episodes (also known as **sickle cell crisis**) cause sudden and intense pain in the bones, chest, back, arms, and legs.
- **Delayed growth and puberty.**

➢ **Treatment Processes:**

- **Blood Transfusions:** These can help relieve anaemia and reduce the risk of pain crises.
- **Hydroxyurea:** This medication can help **reduce the frequency of painful episodes** and prevent some of the disease's long-term complications.
- **Gene Therapy:** It can also be treated by bone marrow or **stem cell** transplantation by methods like **Clustered regularly interspaced short palindromic repeats (CRISPR).**



Note:

What is India's Current Status of Sickle Cell Disease (SCD)?

- **India ranks third globally** in terms of the **number of SCD births**, following Nigeria and the **Democratic Republic of the Congo**.
- Regional studies indicate that an **estimated 15,000 to 25,000 babies** with SCD are born in India annually.
  - Most of **these births occur in tribal communities,** highlighting the geographical and socioeconomic disparities in healthcare access and awareness.

What are the Challenges Related to the Treatment and Accessibility of SCD?

- **Limited Awareness:** There is a **lack of understanding about SCD** among the public and healthcare providers, leading to delayed diagnosis and inadequate treatment.
- **Inadequate Healthcare Infrastructure:** Many rural and tribal areas lack specialised healthcare facilities and trained medical personnel for managing SCD.
- **High Treatment Costs**: The long-term management of SCD can be financially burdensome for many families due to the cost of medications, regular check-ups, and potential hospitalizations.
  - For Example, **Treatments like CRISPR cost $ 2-3 million**, and it's difficult to find bone marrow donors.
- **Limited Access to Medications**: Inconsistent availability of essential medications for SCD treatment, such as **hydroxyurea and pain relievers**, is a concern in certain regions.
- **Inadequate Screening Programs:** The **absence of systematic newborn screening** and early detection initiatives results in missed opportunities for early intervention and genetic counselling.
- **Geographical and Socioeconomic Barriers**: Rural, **remote, and tribal communities** face challenges in accessing quality healthcare due to geographical isolation, lack of transportation, and socioeconomic factors.
  - **Stigma and Discrimination** further hinder access to healthcare services.

What are the Government Initiatives Regarding SCD?

- **National Sickle Cell Anaemia Elimination Mission**:
  - Aimed at enhancing the care for all **Sickle Cell Disease (SCD)** patients and reducing the disease's prevalence through an integrated approach **encompassing screening and awareness campaigns.**
  - Targeting **complete elimination of sickle cell disease as a public health concern by 2047.**
    - Under the Sickle Cell Anaemia Mission, **the Council of Scientific and Industrial Research (CSIR)** is developing gene-editing therapies for SCD.
- **National Health Mission (NHM) 2013:**
  - It is, a flagship programme of the Indian government, that encompasses provisions for disease prevention and management, with a **specific focus on hereditary anomalies such as sickle cell anaemia**.
  - Dedicated programs within NHM focus on **raising awareness, facilitating early detection, and ensuring timely treatment** of sickle cell anaemia.
  - NHM facilitates drugs like hydroxyurea to treat SCD in its "**essential medicines List"**.
- **The National Guidelines for Stem Cell Research 2017:**
  - It **restricts the commercialisation of stem cell therapies** to clinical trials, except for Bone marrow transplantation (BMT) for SCD.
  - Gene editing on stem cells is permitted only for in-vitro studies.
- **National Guidelines for Gene Therapy Product Development and Clinical Trials 2019:** It provides guidelines for the development and clinical trials of gene therapies for inherited genetic disorders.
  - India has also approved a **five-year project** to develop CRISPR techniques for sickle cell anaemia treatment.
- **State Haemoglobinopathy Mission of Madhya Pradesh**:
  - It aims to address the challenges in **screening and management of the disease**.
- **Rights of Persons with Disabilities (RPwDs) Act, 2016:**
  - **SCD is included in the 21 disabilities** that provide for benefits such as **reservation in higher education (minimum 5%), government jobs (minimum 4%), and allocation of land (minimum 5%)**, for persons with benchmark disabilities and those with high support needs.
  - **Free education** is guaranteed for every child with a benchmark disability between 6 and 18 years.

Note:

Note:

- Recently, the **US Food and Drug Administration (FDA)** approved **two gene therapies** designed for sickle cell disease.
- The approved therapies include **Lyfgenia** and **Casgevy**.
  - Both treatments received clearance for individuals aged 12 years and above.
  - **Casgevy also approved in the U.K.,** is the **first CRISPR-based therapy** to have received regulatory approval.
  - **Lyfgenia** doesn't use CRISPR **but depends on a viral vector to change blood stem cells.**
- **Both treatments entail** collecting a patient's blood stem cells, modifying them, and **administering high-dose chemotherapy to destroy the damaged cells** in the bone marrow.
- The modified cells are then infused into the patient through a hematopoietic stem cell transplant.

Health Effects of Covid-19 Related Immunisation Disruptions

Why in News?

Recently, a new paper has been published in the journal **The Lancet Global Health titled-** ***Estimating the Health Effects of Covid-19-Related Immunization Disruptions in 112 Countries During 2020–30: A Modelling Study,*** which highlights that **Global immunization declined during the Covid-19 pandemic**, increasing disease burden and outbreak risk.

What are the Key Highlights of the Report?

- **Global Immunisation Decline:**
  - The Covid-19 pandemic led to a decline in global immunisation coverage, which increased **disease burden and outbreak risks** across various countries.
  - It is estimated that disruptions to **Measles, Rubella, HPV (Human Papillomavirus), Hepatitis B**, meningitis A, and **yellow fever vaccination** could lead to approximately **49,119 additional deaths during the calendar years 2020–2030**, with measles being the main contributor to this increase in mortality.
    - For the years 2020–2030, disruptions in vaccination coverage across all **14 pathogens could result in a 2.66% reduction** in the long-term effect, translating to a decrease in the number of deaths **averted from 37,378,194 to 36,410,559**.
- **Importance of Catch-Up Vaccines:**
  - The importance of **catch-up vaccines** is emphasised, particularly **for diseases like measles and yellow fever,** which experienced an immediate increase in burden post-pandemic.
  - Catch-up activities were found to be **effective in averting excess deaths**, with the potential to **prevent approximately 79% of excess deaths** related to measles, rubella, HPV, hepatitis B, and yellow fever.
- **Impact on DTP Vaccine Coverage:**
  - The pandemic impacted **coverage for the Diphtheria, Tetanus, and Pertussis (DTP) vaccines**, resulting in an additional 6 million children missing out on vaccination in 2021 globally.
- **Resurgence of Measles Cases:**
  - There has been a resurgence of measles cases reported in several countries, including those where measles was previously considered eradicated, such as the **United Kingdom and the United States.**
    - In 2021, nearly 61 million measles vaccine doses were postponed or missed due to Covid-19-related delays in immunisation campaigns in 18 countries.
    - Furthermore, in 2022, there was an increase in **measles cases and deaths globally compared to 2021 levels**, with millions of children missing their vaccine doses, particularly in countries like **Nigeria, Pakistan, and India.**
- **Recommendations:**
  - **Effectiveness of Catch-Up Activities:** The study suggested that implementing catch-up vaccination activities could potentially avert 78.9% of excess deaths between calendar years 2023 and 2030.
    - This means that proactive catch-up efforts have the potential to **significantly mitigate the adverse impacts** of vaccine-coverage disruptions.
  - **Importance of Timing and Targeting of Catch-Up Activities:** It is important for timely implementation of **catch-up vaccination activities**, tailored to specific cohorts and regions most affected by disruptions.

- This targeted approach can help improve vaccine coverage and mitigate the adverse effects of under-immunization.

❍ **Significance of Continued Immunisation Efforts:** Continued importance of sustained immunization efforts, particularly for vaccines like HPV is important, which play a crucial role in preventing cervical cancer.

- This underscores the necessity of ongoing vaccination campaigns even amidst disruptions to ensure long-term public health benefits.

What are the Major Initiatives Related to Immunisation?

➢ **Global:**

❍ **Immunisation Agenda 2030 (IA2030):** It sets an ambitious, overarching global vision and strategy for vaccines and immunisation for the decade 2021–2030.

- By the end of the decade, IA2030 aims to:
  - Reduce by 50% the number of children receiving zero vaccine doses
  - Achieve 500 introductions of new or under-utilised vaccines in low- and middle-income countries
  - Achieve 90% coverage for essential childhood vaccines

❍ **World Immunisation Week:** It is celebrated every year in the last week of April.

❍ **Big Catch-Up Initiative:** It was launched by the **WHO, UNICEF, Bill & Melinda Gates Foundation** along with **Immunization Agenda 2030** and many other global and national health partners, a targeted global effort **to boost vaccination among children following declines driven by the Covid-19 pandemic.**

➢ **Indian:**

❍ **Universal Immunization Programme (UIP):**

- The program provides free immunization against 12 vaccine-preventable diseases.
- **Nationally Against 9 Diseases:** Diphtheria, Pertussis, Tetanus, Polio, Measles, Rubella, severe form of Childhood Tuberculosis, Hepatitis B and Meningitis & Pneumonia caused by Haemophilus influenza type B
- **Sub-nationally Against 3 Diseases:** Rotavirus diarrhoea, Pneumococcal Pneumonia and Japanese Encephalitis
- Two major milestones of the UIP have been the **eradication of polio** in 2014 and the **elimination of maternal and neonatal tetanus in 2015.**

❍ **Mission Indradhanush:**

- **Mission Indradhanush (MI)** was launched by the Ministry of Health and Family Welfare (MOHFW) in 2014 **to vaccinate all unvaccinated and partially vaccinated children under UIP.**
  - It is being implemented in several phases.

Fair Share for Health and Care Report

Why in News?

Recently, the **World Health Organization (WHO)** released a new report titled - ***Fair Share for Health and Care report***, addressing the gender gap in global healthcare.

What are the Key Highlights of the Report?

➢ **Gender Disparities in Health and Care Workforce:**

❍ Women comprise 67% of the paid global health and care workforce. Additionally, they **perform an estimated 76% of all unpaid care activities.**

❍ This highlights significant gender **disparities in both paid and unpaid care work**.

❍ Women in low- or middle-income countries could be USD 9 trillion **better off if their pay and access to paid work were equal** to that of men.

➢ **Not Adequately Represented on Decision-Making:**

❍ Women are not adequately represented on decision-making tables. Women are **overrepresented in lower-status roles**, comprising the majority of nurses and midwives.

❍ They are, however, underrepresented in leadership roles. Medical specialties are still dominated by men. Women made up 25% to 60% of doctors but between **30% and 100% of nursing staff across 35 countries.**

➢ **Underinvestment in Health Systems:**

❍ Chronic underinvestment in health and care work has led to a vicious cycle of unpaid care work,

Note:

reducing women's participation in paid labour markets, hindering economic empowerment, and impeding gender equality.

- **Devaluation of Caregiving:**
  - Caregiving, primarily performed by women, tends to be undervalued, leading to lower wages, poor working conditions, decreased productivity, and a negative economic impact on the sector.
- **Implications of Gender Pay Gaps:**
  - Pay gaps limit women's investment in their family and community, which is where they are likely to reinvest.
  - Globally, on average**, 90% of women's earnings are directed towards their families' well-being,** compared to only 30-40% of men's.
- **Higher Levels of Violence:**
  - Women in healthcare disproportionately experienced higher levels of gender-based violence.
  - According to some estimates, a quarter of workplace violence across all sectors of the globe occurs in healthcare.
    - At least **half of all employees in the healthcare** sector have reported **experiencing violence at some point in the workplace.**
- **Indian Scenario:**
  - In India, **women spent around 73% of their total daily working time** (that is, the combined average time spent on unpaid and paid work recorded through national daily time-use surveys) **on unpaid work,** compared to **men who spent around only 11%** of their daily working time on unpaid work.
    - In the United Kingdom, nearly 4.5 million people took on unpaid work during Covid-19, 59% of whom were women, with nearly 3 million working simultaneously.
- **Global Crisis of Care:**
  - Decades of underinvestment in health and care work contribute to a growing global crisis of care.
  - Stagnation in progress towards Universal Health Coverage (UHC) leaves billions without full access to essential health services, further burdening women with unpaid care work.
- **Key Recommendations:**
  - Improve working conditions for all forms of health and care work, especially for highly feminised occupations.
  - Include women more equitably in the paid labour workforce
  - Enhance conditions of work and wages in the health and care workforce and ensure equal pay for work of equal value.
  - Address the gender gap in care, support quality care work and uphold the rights and well-being of caregivers.
  - Ensure that national statistics account for, measure and value all health and care work.
  - Invest in robust public health systems.

What are the Government Initiatives to Deal with Gender Disparity?

- **Economic Participation and Health and Survival:**
  - **Beti Bachao Beti Padhao:** It ensures the protection, survival and education of the girl child.
  - **Mahila Shakti Kendra:** Aim to empower rural women with opportunities for skill development and employment.
  - **Mahila Police Volunteers:** It envisages the engagement of Mahila Police Volunteers in States/UTs who act as a link between police and community and facilitate women in distress.
  - **Rashtriya Mahila Kosh:** It is an apex micro-finance organisation that provides micro-credit at concessional terms to poor women for various livelihood and income-generating activities.
  - **Sukanya Samriddhi Yojna:** Under this scheme, girls have been economically empowered by opening their bank accounts.
  - **Female Entrepreneurship:** To promote female entrepreneurship, the Government has initiated Programmes like Stand-Up India and Mahila e-Haat (online marketing platform to support women entrepreneurs/ SHGs/NGOs), Entrepreneurship and Skill Development Programme (ESSDP).
  - **Kasturba Gandhi Balika Vidyalaya:** They have been opened in Educationally Backward Blocks (EBBs).
- **Political Reservation:** Government has reserved 33% of the seats in Panchayati Raj Institutions for women.
  - **Capacity Building of Elected Women Representatives:** It is conducted with a view to empowering women to participate effectively in the governance processes.

Note:

Profits and Poverty: The Economics of Forced Labour

Why in News?

Recently, the **International Labour Organization (ILO)** released a report titled ***'Profits and poverty: The economics of forced labour'***, which has found that **Forced Labour** generates illegal profits worth USD 36 billion per year.

What is Forced Labour?

- According to ILO, forced or compulsory labour is "all work or service that is **exacted from any person under the menace of any penalty** and for which said person has not offered himself voluntarily".
- Forced labour is defined, for **purposes of measurement**, as work that is both **Involuntary** and under penalty or menace of a penalty (coercion).
  - **Involuntary** work refers to **any work undertaken without the free and informed consent** of the worker.
  - **Coercion** refers to the means used to **compel someone to work without their free and informed** consent.

What are the Key Highlights of the Report?

- **Increase in Illegal Profits:**
  - Forced labour generates **illegal profits worth USD 36 billion per year**, which is a 37% increase since 2014.
  - This increase is attributed to **both a growth in the number of people forced** into labour and higher profits generated from the exploitation of victims.
- **Regional Distribution of Illegal Profits:**
  - Total annual illegal profits from forced labour are highest in **Europe and Central Asia (USD 84 billion)**, followed by **Asia and the Pacific (USD 62 billion)**, the Americas (USD 52 billion), Africa (USD 20 billion), and the Arab States (USD 18 billion).
- **Profit Generation Per Victim:**
  - Traffickers and criminals are estimated to generate close to USD 10,000 per victim, up from USD 8,269 a decade ago.
  - Forced **commercial sexual exploitation accounts** for more than **two-thirds (73%) of the total illegal profits**, despite accounting for only 27% of the total number of victims in privately imposed labour.
- **Sectors with Highest Illegal Profits:**
  - After forced commercial sexual exploitation, the sector with the highest annual illegal profits from forced labour is industry (USD 35 billion), followed by services (USD 20.8 billion), agriculture (USD 5.0 billion), and domestic work (USD 2.6 billion).
    - **The Industry Sector** includes **Mining and quarrying, manufacturing**, construction and utilities.
    - **The Services Sector** encompasses activities related to **wholesale and trade**, accommodation and food service activities, art and entertainment, personal services, administrative and support services, education, health and social services, and transport and storage.
    - **The Agriculture Sector** includes forestry, hunting as well as the cultivation of **crops, livestock production and fishing**.
    - **Domestic work** is performed in third party households.
- **Increase in Number of People in Forced Labour:**
  - There were 27.6 million people engaged in forced labour on **any given day in 2021**, representing an increase of **2.7 million since 2016.**
- **Recommendations:**
  - **Need for Comprehensive Approach:** The report emphasises the urgent need for investment in enforcement measures to stem illegal profit flows and hold perpetrators accountable.
    - It highlights the importance of **strengthening legal frameworks, providing training** for enforcement officials, **extending labour inspection** into high-risk sectors, and better coordination between labour and criminal law enforcement.
  - **Addressing Root Causes**: While law enforcement measures are crucial, the report underscores that forced labour cannot be ended through enforcement actions alone. It must be part of a comprehensive approach that prioritises addressing root causes and safeguarding victims.
  - **Promoting Fair Recruitment Processes:** Promoting fair recruitment processes is deemed crucial as forced labour cases can often be traced back to recruitment abuses. **Ensuring the freedom of workers to associate and to bargain collectively** is also essential in combating forced labour.

Note:

What are India's Initiatives to Deal with Forced Labor?

- **Article 23:**
  - It prohibits **trafficking in human beings**, including trafficking for the purpose of forced labour, slavery, or exploitation.
  - It recognizes the **inherent dignity and rights of individuals**, ensuring **protection against such practices.**
- **Article 24 of the Constitution:**
  - No child below the age fourteen years shall be employed in work in any factory or mine or engaged in **any other hazardous employment**.
- **Platform for Effective Enforcement for No Child Labour (PENCIL) Portal 2017**:
  - It is an electronic platform that aims at involving Centre, State, District, Governments, civil society and the general public in achieving the target of child labour free society.
  - It has been launched for the effective implementation of Child Labour Act and National Child Labour Project (NCLP) Scheme.
- **Bonded Labour System (Abolition) Act 1976:**
  - The Act extends to the whole of India but is implemented by respective state governments. It provides for an institutional mechanism at the district level in the form of Vigilance Committees.
    - Vigilance committees advise District Magistrate (DM) to ensure the provisions of this act are properly implemented.
  - The State Governments/UTs may confer, on an Executive Magistrate, the powers of a Judicial Magistrate of the first class or second class for the trial of offences under this Act.
- **Central Sector Scheme for Rehabilitation of Bonded Labourers (2021):**
  - The Ministry of Labour and Employment revamped the scheme for **rehabilitation of bonded labourers (2016)** in 2021, providing an immediate financial assistance **of Rs 30,000 to the rescued person by the district administration.**
  - The scheme also provides for the creation of a Bonded Labour Rehabilitation Fund at the district level, with a permanent corpus of at least Rs **10 lakh at the disposal of the District Magistrate.**
    - This fund can be renewed to extend immediate help to the released bonded labourers.

What is the International Labour Organization?

- **About:**
  - The **International Labour Organization (ILO)** is the only tripartite UN agency, since 1919. It brings together governments, employers and workers of 187 member States, to set labour standards, develop policies and devise programmes promoting decent work for all women and men.
- **Established:**
  - By the **1919 Treaty of Versailles** as an affiliated agency of the League of Nations.
  - Became the first affiliated specialised agency of the United Nations in 1946.
- **Headquarters:** Geneva, Switzerland
- **Founding Mission:** Social justice is essential to universal and lasting peace.
  - Promotes internationally recognized human and labour rights.
- **Nobel Peace Prize:**
  - Received in 1969 for
    - improving peace among classes
    - Pursuing decent work and justice for workers
    - Providing technical assistance to other developing nations

India's Progress in Gender Equality

Why in News?

Recently, the **Gender Inequality Index (GII), 2022** has been released by **UNDP** in their **Human Development Report 2023-24.**

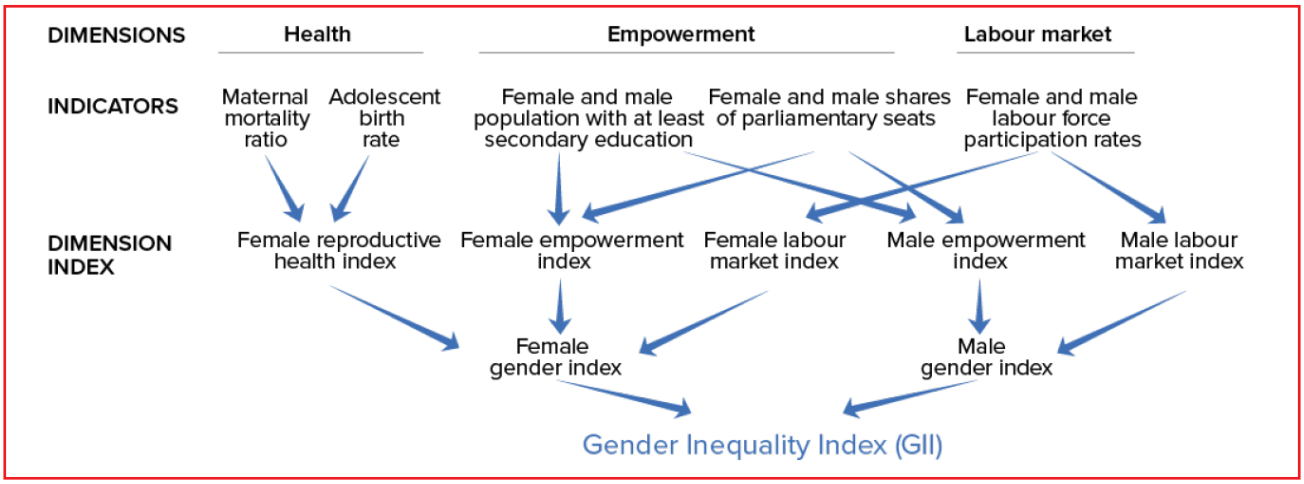
- In GII, India stands at rank **108th** out of 193 countries, with a score of 0.437.

What is the Gender Inequality Index?

- **About**: GII is a composite metric of gender inequality using three dimensions: **reproductive health, empowerment and the labour market.**
  - It reflects the gap in human development potential due to inequality between female and male achievements in these areas.
  - GII values range from **0 (equality) to 1 (extreme inequality).**
    - A low GII value indicates low inequality between women and men, and vice-versa.

Note:

- **Dimensions and Indicators:**



- **India's Progress:**
  - India stood at rank **122 out of 191 countries** with a score of 0.490 in the Gender Inequality Index 2021.
  - The current data shows a significant jump of 14 ranks on GII 2022 vis-a-vis GII 2021.
  - Over the last 10 years, India's rank in GII has become **consistently better,** indicating progressive improvement in achieving gender equality in the country.

Note:

- **Maternal Mortality Ratio**: Number of deaths due to pregnancy-related causes per 100,000 live births.
- **Adolescent Birth Rate:** Annual number of births to females aged 10-14 or 15-19 years per 1,000 females in the respective age group.
- **Labor Force Participation Rate:** Proportion of the working-age population (ages 15 and older) that engages in the labour market, either by working or actively looking for work, expressed as a percentage of the working-age population.

What are the Major Issues Related to Gender Inequality in India?

- **Gender-Based Violence:** Women and girls in India often face various forms of **violence**, including **domestic violence, sexual harassment,** rape, dowry-related violence, and **honour killings.**
  - These issues contribute significantly to the gender inequality landscape.
  - Nearly **one-third of women in India** have experienced physical or sexual violence, according to the **National Family Health Survey-5 report**.
- **Unequal Access to Education:** Despite efforts to improve education access, disparities still exist between boys and girls in terms of **enrollment, retention, and completion rates.**
  - Cultural norms, economic constraints, and safety concerns often hinder girls' education.
- **Invisible Labour:** Women in India often perform a significant amount of **unpaid care work,** including **household chores, childcare, and eldercare**, which is often overlooked and undervalued, contributing to their economic dependency and time poverty.
- **Gender Wage Gap**: Women in India generally earn less than men for similar work, reflecting a significant **gender wage gap.**
  - This gap is prevalent across various sectors and levels of employment.
  - According to the estimates of the **World Inequality Report 2022**, in India, men earn 82% of the labour income, whereas women earn 18% of it.
- **Child Marriage**: Child marriage disproportionately affects girls, depriving them of educational and economic opportunities and exposing them to health risks.
  - According to UNESCO, **one in three of the world's child brides live in India.**
    - **Child brides include girls under 18 who are already married**, as well as women of all ages who first married in childhood.
  - The prevalence of child marriage has reduced by half from **47% in 2006 to 23.3% during 2019-21 (NFHS-5).**

Note:

- However, a few States such as **Andhra Pradesh, Assam, Bihar, Jharkhand, Rajasthan, Telangana, Tripura and West Bengal** have higher prevalence of child marriage than the national average.

What are the Indian Government Initiatives to Promote Gender Equality?

- **Beti Bachao Beti Padhao (BBBP)** ensures the protection, survival, and education of the girl child.
- **Mahila Shakti Kendra (MSK)** aims to empower rural women through skill development and employment opportunities.
- The **National Creche Scheme** offers safe environments for children, enabling women to pursue employment.
- **Pradhan Mantri Matru Vandna Yojna** provides maternity benefits to pregnant and lactating mothers.
- **Pradhan Mantri Awas Yojana** ensures housing under women's names.
- **Sukanya Samriddhi Yojna (SSY)** economically empowers girls through bank accounts.
- **Gender Budget** has been made a part of the Union Budget of India since 2005 and entails fund allocation towards programmes/schemes dedicated to women.
- **Nirbhaya Fund Framework** provides for a **non-lapsable corpus fund** for the implementation of initiatives aimed at enhancing the safety and security of women in the country.
- **One Stop Centres (OSCs)** offer integrated services for women victims of violence, including medical aid, legal assistance, and counselling.
- The **Constitution (106th Amendment) Act, 2023**, reserves **one-third of all seats for women in Lok Sabha, State legislative assemblies, and the Legislative Assembly** of the National Capital Territory of Delhi, including those reserved for SCs and STs.
  - 33% reserved seats in Panchayati Raj Institutions for women are already in place.
- The **Vigyan Jyoti programme** aims to encourage girls to pursue higher education and careers in **STEM (Science, Technology, Engineering and Mathematics),** especially in the areas where women's participation is low in order to balance the gender ratio across the streams.
- Other Initiatives like **Stand-Up India,** Mahila e-Haat, Entrepreneurship and Skill Development Programme (ESSDP), and **Pradhan Mantri Mudra Yojana (PMMY)** promote women entrepreneurs.

Global Gender Gap Report (World Economic Forum):

- The Global Gender Gap Index annually benchmarks the current state and evolution of gender parity across four key dimensions (**Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment**).
  - It is the longest-standing index, which tracks progress towards closing these gaps over time since its inception in **2006**
  - India was ranked at **127 out of 146 countries** in the **Gender Gap Report, 2023.**

SBI's Study on Empowering Women Through SHGs

Why in News?

The **State Bank of India (SBI)** recently unveiled a research study highlighting the evolving dynamics of **Self-Help Groups (SHGs)** in India.

- This study delves into the patterns of credit utilisation and digital behaviours among SHGs, their members, and the emerging group known as **'Lakhpati Didis'.**

What are the Key Highlights of the Study?

- **Rise of SHGs and Lakhpati Didis:**
  - The SHGs in India, numbering **approximately 8.5 million with approximately 92.1 million members**, are spearheading a transformative revolution.
    - A notable outcome of this movement is the rising proportion of **Lakhpati Didis**.
      - Lakhpati Didi is a government initiative that aims to empower **women in SHGs to earn at least Rs 1,00,000 per year** through sustainable livelihood practices.
      - The program was launched in 2023 with an initial target of 2 crore women, but the target has been increased to 3 crore in 2024-25.
    - This movement underscores the **growing contribution of women to Gross Value Added (GVA) and economic output**.

Note:

- Through formalisation initiatives, the increasing participation of women in the formal sector is evident, as reflected in the **rising female Labor Force Participation Rate (LFPR).**

➢ **Bank Linkage and Credit Access:**

- **SHG Bank Linkage Programme (SHG-BLP),** stands as a game-changer with approximately **97.5% of SHGs now holding bank accounts.**
  - This robust banking relationship enables timely credit access, critical for economic value addition. With **optimal funds at reduced interest rates,** SHGs overcome roadblocks, unlocking their full marketing potential.
  - The SHG portfolio of **Scheduled Commercial Banks (SCBs)** is now nearing Rs 2 trillion.

➢ **Credit Utilisation and Repayment:**

- Average limit sanctioned to SHGs has increased **2.2 times in FY24 compared to FY19.**
- Credit repayment has significantly improved, with average repayment increasing by 3.9 times in FY24 compared to FY19, demonstrating judicious and timely repayment.

➢ **Digital Inclusion:**

- **Bank Mitras** and **Digital Didis** are enabling financialisation at an unprecedented scale.
- Initiatives like **SARAS Melas** are commendable but can be further augmented by onboarding them onto digital platforms like **Open Network for Digital Commerce (ONDC).**
- Expenditure through the **Aadhar Enabled Payment system** increased by at least 3 times in FY24 from FY23 in all regions.

➢ **Income Growth:**

- Female SHG member incomes have tripled during FY19-FY24, with urban members seeing a 4.6 times increase.
- Around 65% of rural SHG members have moved upwards in relative income in FY24 vs FY19.

➢ **State-wise Progress:**

- While **Andhra Pradesh and Telangana lead in SHGs**, other states like Tamil Nadu, Uttarakhand, Kerala, Punjab, and Gujarat have also increased female SHG incomes significantly.
  - By FY27, India is expected to have millions of Lakhpati Didis in almost every state.

Self-Help Groups (SHGs)

➢ Self-help groups (SHGs) are **informal associations of individuals with similar socio-economic backgrounds,** aiming to collectively address common issues such as **poverty, illiteracy, and lack of skills.**

➢ These groups promote self-governance and peer support, fostering self-employment and poverty alleviation within marginalised communities.

➢ The SHG model was introduced in India in 1984, inspired by ***Prof. Yunus's Grameen Bank model.***

- **Kudumbashree in Kerala, Mahila Arthik Vikas Mahamandal in Maharashtra**, and **Looms of Ladakh** are a few examples of **success stories from SHGs.**
  - **Looms of Ladakh, a Pashmina brand** with 427 women SHG members, recorded sales of Rs 34 lakh in FY 2022-23 and Rs 42 lakh in the first 10 months of 2023-24, showcasing exponential growth.

SHG-Bank Linkage Programme (SHG-BLP)

➢ The SHG-BLP, initiated by the **National Bank for Agriculture and Rural Development (NABARD)** in 1989, evolved from an action research to a pilot project by 1992.

- This collaborative effort between SHGs, banks, and NGOs, with support from the **Reserve Bank of India (RBI) and NABARD,** aimed to provide financial services to underserved poor households.
- Over time, it has transformed into the **largest microfinance program globally,** covering approximately **16.19 crore households,** predominantly women groups, thus empowering women across the country.
- NABARD's efforts include policy advocacy, training programs, and capacity building for all stakeholders, contributing to the success of this savings-led microfinance model.

What are the Challenges Faced by SHGs?

➢ **Limited Resources:**

- SHGs typically operate with **limited financial resources**, making it difficult to invest in infrastructure, marketing, and distribution channels required for scaling up operations.

Note:

- **Quality control and standardisation:**
  - Ensuring **consistent quality and standardisation of products** or services can be a challenge for SHGs, particularly when operating on a small scale with **limited resources and technical expertise.**
- **Access to Technology:**
  - Limited access to modern technologies, such as digital platforms, e-commerce solutions, and automated production processes, can hinder SHGs' ability to scale efficiently and reach wider markets.
- **Limited Market Access:**
  - SHGs often struggle to access wider markets beyond their local communities due to **factors such as lack of market information, limited distribution channels, and competition from established businesses.**
- **Socio-Cultural Barriers:**
  - In some communities, SHGs may face sociocultural barriers, such as **gender discrimination, lack of support from family members,** or resistance to change, which can hinder their growth and acceptance.

What are the Initiatives Related to SHGs?

- **Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY – NRLM):** It is implemented in mission mode to organise rural poor women into Self-Help Groups (SHGs).
  - Aims to nurture and support SHGs until they achieve increased incomes and improved quality of life.
  - Implements **Start-up Village Entrepreneurship Programme (SVEP)** and **Mahila Kisan Sashaktikaran Pariyojana (MKSP)** as sub-schemes.
    - SVEP aims to assist SHG members in setting up enterprises at the village level in non-farm sectors.
    - MKSP empowers women in agriculture, covering about 1.77 crore women farmers nationwide.
- **Micro Enterprise Development Programme (MEDPs):**
  - **NABARD,** since 2006, has been supporting need-based skill development programmes (MEDPs) for matured SHGs that already have access to finance from Banks.
    - MEDPs are on-location skill development training programmes that attempt to **bridge the skill deficits or facilitate the optimisation of production activities** already pursued by the SHG members.
- **Scheme for Promotion of Women Self-Help Groups (WSHGs) in Backward and Left Wing Extremism (LWE) Districts of India:**
  - The scheme aims to **establish sustainable WSHGs** with the help of anchor agencies, facilitate credit linkage with banks, provide support for livelihoods, and ensure loan repayments.

■■■

Note:

Science & Technology

Highlights

- *Bone Grafting Technology*
- *Google DeepMind's SIMA and AlphaGeometry*
- *Purification Processes of Water*
- *Refrigerants*
- *Use of Snake Venom for Intoxication*
- *Astronomical Grand Cycles*

Bone Grafting Technology

Why in News?

Recently, the **Indian Institute of Technology (IIT) Kanpur** signed a **Memorandum of Understanding (MoU)** with **Canada based biotechnology company (Conlis Global)** for licensing of an innovative and indigenously developed technology that promotes **bone healing and regeneration.**

What are Nano Hydroxyapatite-based Porous Composite Scaffolds?

- **About:**
  - The **Nano Hydroxyapatite-based Porous Composite Scaffolds** are biodegradable and have **osteoinductive** and **osteopromotive** properties for bone regeneration.
  - It is highly biocompatible ensuring good cell material interaction with **osteoblast cells** exhibiting a high mechanical strength and interaction between the polymer network and the solvent.
- **Characteristics:**
  - It has **osteoinductive** and **osteopromotive** properties due to which it has **bone healing** and **bone growth** characteristics.
  - They are highly biocompatible, resulting in good cell material interaction with **osteoblast cells** exhibiting a high mechanical strength and interaction between the polymer network and the solvent.
    - Osteoblast cells are responsible for **mineralisation of bone** during **bone formation** and **bone remodelling**.
- **Applications:**
  - It is commonly used in **orthopaedic** and **dental implants**, **bone graft substitutes, coatings for prosthetic devices**, and **tissue engineering scaffolds.**
  - Functionalized scaffolds can be used as fillers in **large-size bone defects,** without compromising the **connectivity** and **structural defects, oxygen,** and **blood circulation.**
  - It enhances **tissue formation**, **mineralization**, and **rapid defect healing.**

What is Bone Grafting?

- **About:**
  - **Bone grafting** involves a **surgical technique** where transplanted bone is utilised to **repair** and **reconstruct bones** affected by **disease** or **injury.**
  - This procedure is applicable for **repairing bones** throughout the body.
  - Surgeons may harvest bone from various sources such as the **hips, legs,** or **ribs** for grafting purposes.
- **Objective:**
  - The primary objective of the invention is to **overcome the drawbacks** of the existing remedies.
    - Other alternatives have been associated with **infection** and **immune** related complications.
  - This technology provides the delivery of **bone active molecules**, **antibiotics** or any other drug for combating bone pathologies, reconstruction of irregular bone defects and for dental applications as well.
- **Functions:**
  - The technology facilitates bone regeneration in a biocompatible manner by acting as a carrier for **bone- active biomolecules**, delivering them directly to the site of an implant.

Note:

- The material is a promising approach for reconstructing and repairing bone defects while addressing the drawbacks and complications associated with technologies that are available in the market at present.
- The functionalized scaffolds can be used as fillers in large size bone defects, without compromising the connectivity and structural defects, oxygen and blood circulation thereby enhancing tissue formation, mineralisation, and rapid defect healing.
- It can also be used as a **bone substitute**, overcoming autograft limitations.

Google DeepMind's SIMA and AlphaGeometry

Why in News?

Recently, Google DeepMind has revealed its various **AI (Artificial Intelligence)** products based on **Predictive AI Models**, such as **SIMA (Scalable Instructable Multiworld Agent)** and **AlphaGeometry.**

- **OpenAI's ChatGPT** and **Google's Gemini** have garnered significant attention from various sectors, with companies and researchers, including those in oil and gas as well as pharmaceutical industries, increasingly turning to **Generative AI** **or Predictive AI** for applications such as oil exploration and drug discovery.

What is Predictive AI?

- Predictive AI models are **a type of artificial intelligence system** designed to **forecast or predict future outcomes** based on historical data, patterns, and trends.
- These models utilise advanced algorithms, statistical techniques, and machine learning methods to analyse vast amounts of data and make informed predictions about future events or behaviours.

What is SIMA?

- **About:**
  - SIMA is an AI Agent, which is **different from AI models such as OpenAI's ChatGPT or Google Gemini.**
    - AI models are **trained on a vast data set and are limited when it comes to working on their own.**
    - On the other hand, an AI Agent can process **data and take action themselves.**
  - It is a game assisting AI, making it a valuable asset for enhancing the gaming experience.
  - SIMA can be called a **generalist AI Agent that is capable of doing different kinds of tasks.**
  - It is like a virtual buddy who can understand and follow instructions in **all sorts of virtual environments** – from exploring mysterious dungeons to building **lavish castles.** It can accomplish tasks or solve challenges assigned to it.
- **Working:**
  - SIMA "understands" any person's commands as it has been trained to **process human language**. So when one asks it to build a castle or find the treasure chest, it **understands exactly what these commands mean.**
  - One **distinct feature of this AI Agent** is that it is capable of learning and adapting. SIMA does this through the interactions it has with the user.
- **Training:**
  - Google DeepMind collaborated with eight game studios to train SIMA, an AI agent, on nine different video games including Teardown and No Man's Sky.
  - SIMA learned various skills like navigation, menu use, resource mining, and spaceship flying.
  - They also tested SIMA in **four research environments,** one of which was the Construction Lab in Unity.

What is AlphaGeometry?

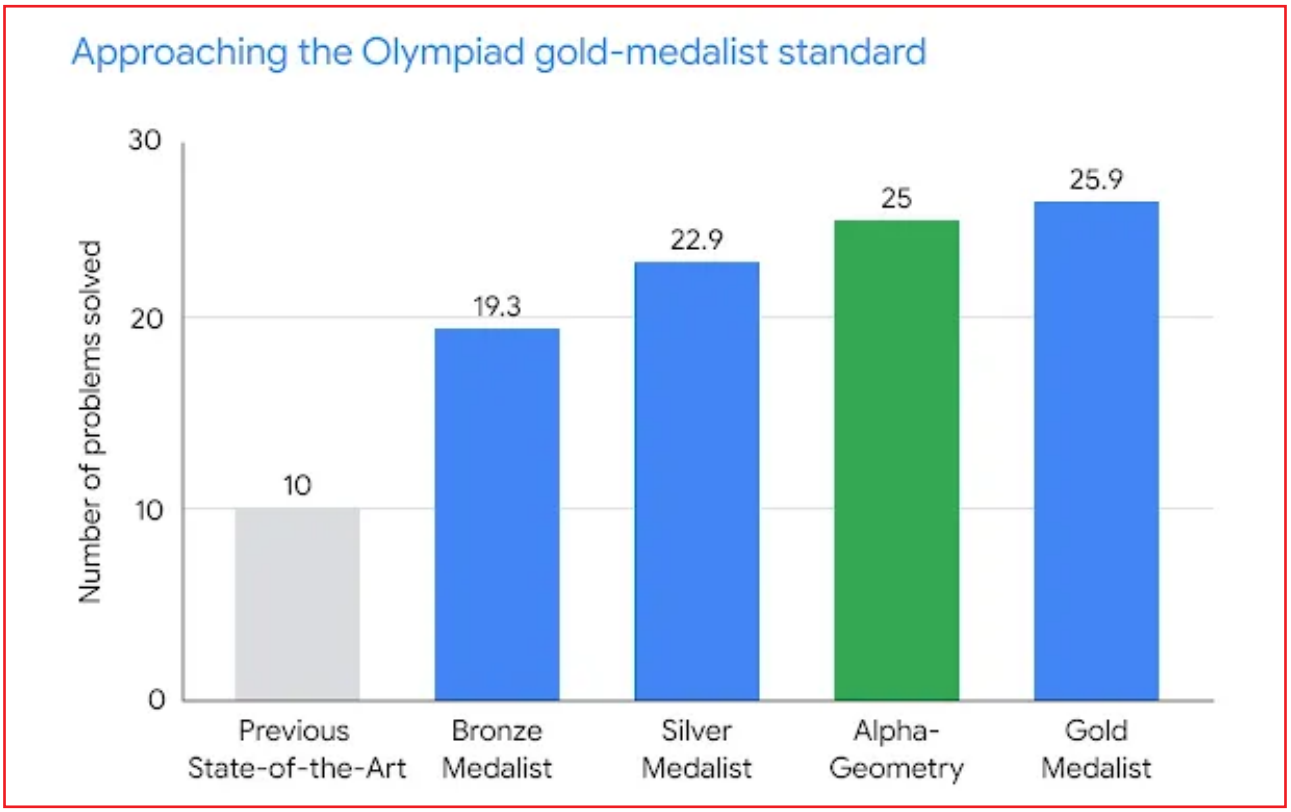
- **About:**
  - DeepMind's AlphaGeometry is a **specialised AI system** designed to tackle complex geometry problems.
  - Unlike general-purpose AI models like OpenAI's ChatGPT or Google's Gemini, AlphaGeometry is **tailored specifically for geometric reasoning tasks.**
  - It combines **advanced neural language modelling techniques** with a symbolic deduction engine specialised in algebraic and geometric reasoning.

Note:

- **Neural language models** are built using neural network architectures, which are computational models inspired by the structure and function of the human brain.
- **Symbolic deduction** is a method of logical reasoning that operates on symbols and logical rules to derive conclusions from premises. In symbolic deduction, statements are represented using symbols, such as variables and logical operators, and logical rules are applied to manipulate these symbols **according to predefined inference rules.**

➢ **Working:**

- It leverages both **neural language models** for intuitive idea generation and **symbolic deduction for precise reasoning**.
- When faced with geometry problems, Alpha Geometry first utilises its language model to suggest **potential geometric construct**s that could aid in solving the problem.
- These suggestions help inform the symbolic deduction engine, which then makes further deductions and approaches the solution systematically.
  - AlphaGeometry's performance was evaluated using a benchmarking set of geometry problems compiled from the **International Mathematical Olympiads (IMO).**
  - It demonstrated impressive results, solving a significant portion of the problems within competition time limits, surpassing previous AI systems in geometry and approaching the performance levels of human gold medallists in the IMO.



How Predictive AI Models are Gaining Traction?

➢ **Volcanic Ash Monitoring:**

- Companies like Moscow-based Yandex are utilising advanced mathematical models and neural networks to **develop interactive maps for real-time monitoring of volcanic ash** dispersion.
- This enables authorities and communities to respond swiftly to ashfall, safeguarding public safety and infrastructure.

➢ **Oil and Gas Exploration:**

- Major oil and gas companies are investing in AI strategies for both upstream (exploration) and midstream (pipeline and logistics) operations.

Note:

- AI algorithms are employed to **analyse past surveys and explorations,** identify patterns and correlations in data, predict probable reserves, optimise extraction methods, and reduce costs.
  - For instance, Shell and Saudi Aramco are leveraging **generative AI tools to improve subsurface imaging**, analyse drilling plans, and make precise forecasts for refined products.

➢ **Medicine Research:**

- Deep Neural networks are being applied in drug discovery to develop predictive models for **assessing the properties of chemical compounds** and their potential effectiveness in targeting specific diseases.
- Pharmaceutical companies like Merck are using **machine learning techniques to enhance drug discovery** processes, leading to the development of new models for compound assessment.
  - Collaborative initiatives such as the **European Union's (EU's)** MELLODDY Project aim to improve **predictive models through federated learning**, ensuring **data privacy and protection** while pooling resources for enhanced research outcomes.

What are India's Initiatives for Generative AI?

➢ **Launching the Generative AI Report: INDIAai,** the Government of India's National AI Portal, conducted numerous studies and **hosted three roundtable discussions** with some of the most prominent voices in Generative AI, AI Policy, AI Governance and Ethics, and academia to examine the impact, ethical and regulatory questions, and opportunities it brings to India.

➢ **Joining the Global Partnership on Artificial Intelligence (GPAI):** In 2020, India joined forces with 15 other countries to form the GPAI. The purpose of this alliance is to establish frameworks for the responsible utilisation of emerging technologies.

➢ **Fostering an AI Ecosystem within the Country:** The Indian government has been dedicated to fostering an AI ecosystem within the country **by investing in research and development, supporting startups** and innovation hubs, creating AI policies and strategies, and promoting AI education and skilling.

- National Strategy for Artificial Intelligence:
  - The Government has published the National Strategy for Artificial Intelligence with the **objective of developing an ecosystem for the research and adoption of Artificial Intelligence.**
- National Mission on Interdisciplinary Cyber-Physical Systems:
  - Under this Mission, Technology Innovation Hubs (TIH) has been established on Artificial Intelligence and Machine Learning at the Indian Institute of Technology (IIT) Kharagpur, which aims **to provide the state-of-the-art training and capacity building for the creation of next-generation scientists**, engineers, technicians, and technocrats in the field of Artificial Intelligence.
- Artificial Intelligence Research, Analytics and Knowledge Assimilation Platform:
  - It is a Cloud computing platform, aiming to make India a pioneer amongst emerging economies with regards to AI and transform sectors like education, health, agriculture, urbanization and mobility.

Purification Processes of Water

Why in News?

In recent years, Reverse Osmosis (RO) has gained popularity for its ability not only to eliminate impurities and pathogens from water but also to reduce TDS (Total Dissolved Solids) levels, however, concerns arise due to the loss of essential minerals **such as calcium and magnesium.**

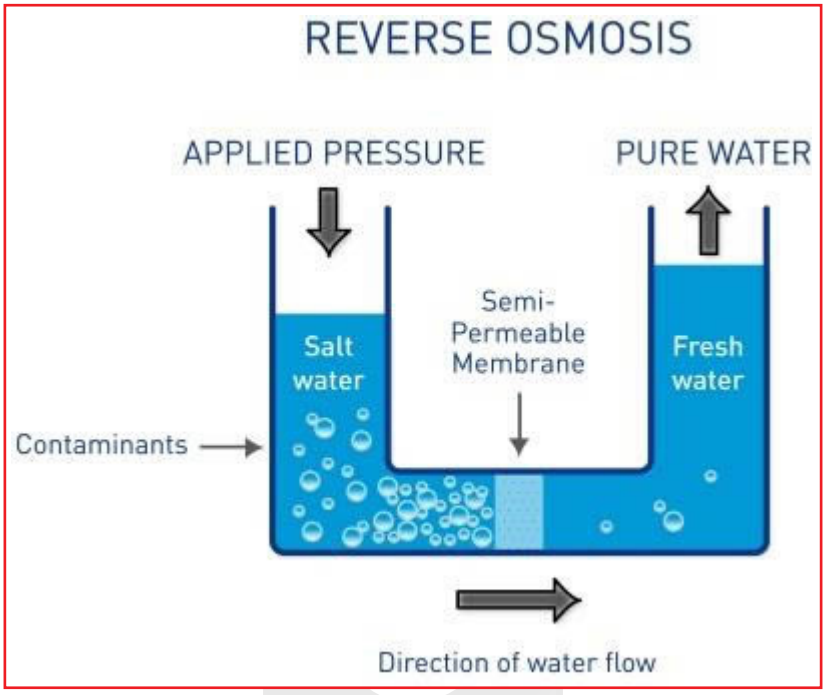
What is the RO Water Purification Method?

➢ **About:**

- RO is a water purification process that **removes contaminants from water by utilising a semi-permeable membrane**.
  - A typical RO system consists of a semi-permeable membrane, **with pores 0.0001 to 0.001 microns in size**.
- In this method, **water is forced through the membrane under pressure**, while contaminants such as **dissolved solids, chemicals, microorganisms**, and other impurities are left behind.
- The membrane a**llows water molecules to pass throug**h while blocking larger molecules and ions.

Note:

- The RO process effectively removes a wide range of impurities, including salts, heavy metals, bacteria, viruses, and organic compounds, producing clean and purified water.
  - This technology is widely used in both residential and industrial settings to improve water quality for drinking, cooking, and various other applications.



➢ **Reasons for Growing Demand for RO Water:**

- **Poor Water Quality:** Many regions, especially rural areas, face challenges with poor quality groundwater or tap water. Issues such as **brackish taste, unpleasant odour**, and contamination with pollutants like chlorine or heavy metals drive **people to seek alternative sources** of clean drinking water.
- **Perceived Health Benefits:** There is a common belief among consumers that **RO water is healthier and safer to drink** compared to untreated or municipally supplied water.
  - Despite **limited scientific evidence supporting this belief**, the perception of improved health outcomes associated with **RO water consumption contributes to its popularity.**
- **Convenience and Accessibility**: RO water is readily available through water purification plants and point-of-use domestic RO systems.
  - This convenience, coupled with the **ease of installation and maintenance, makes it a preferred choice for consumers** seeking hassle-free access to clean drinking water.
- **Increasing Urbanisation:** Rapid urbanisation and population growth lead to higher demand for clean water, especially in urban areas where groundwater contamination and municipal water quality issues are prevalent.
  - As a result, the demand for **RO water purification systems rises to meet the needs of the urban population.**
- **Technological Advancements:** Continuous advancements in RO technology have led to the development of more efficient and cost-effective water purification systems.
  - These innovations make RO water more accessible and appealing to a wider range of consumers.

What are the Concerns Related to the RO Process?

➢ **Loss of Essential Minerals:**

- RO systems are **highly effective at removing impurities and pathogens** from water, including minerals like calcium and magnesium.
- While this purification process ensures clean water, it also **leads to a reduction in essential minerals** that are beneficial for human health.

Note:

- This loss of minerals, especially **calcium and magnesium, can potentially contribute to micronutrient deficiencies** and pose a public health threat, particularly in regions where people already **suffer from such deficiencies.**

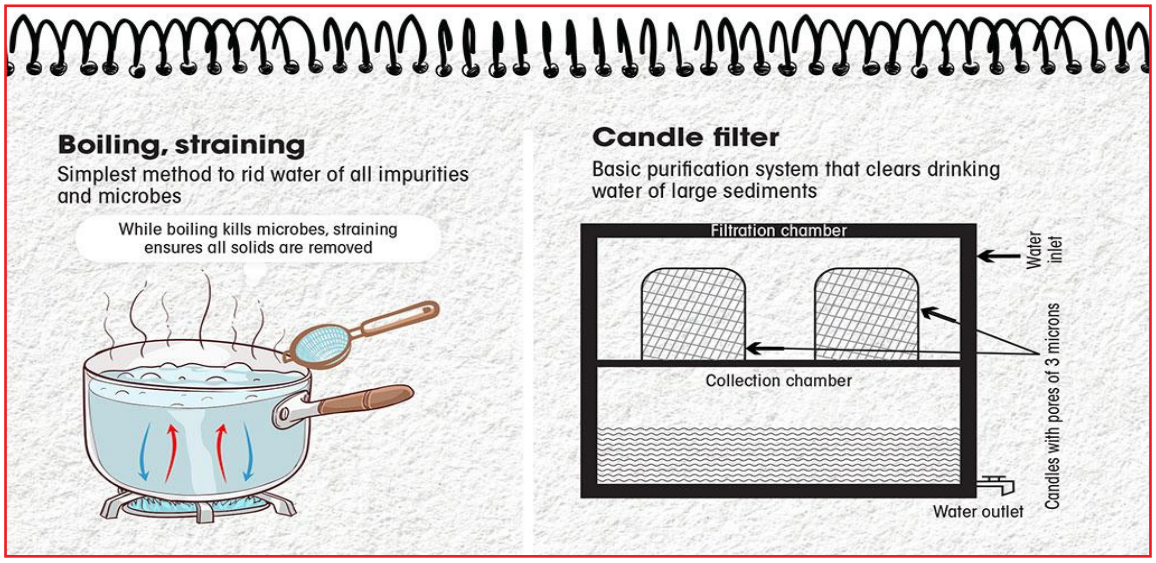
➢ **Extreme Less TDS Levels:**

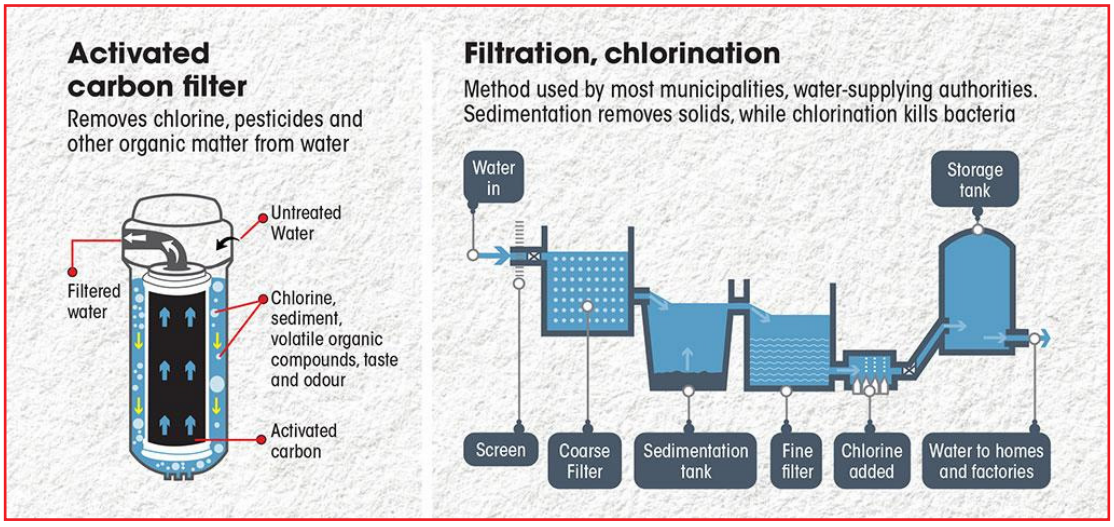
- In several studies, it was discovered that the **Total Dissolved Solids (TDS) l**evel was below 50 mg/l in numerous locations, indicating a significant reduction in calcium and magnesium levels.
  - In one study conducted across nearly 4,000 locations nationwide, TDS levels were observed to range from 25 to 30 mg/l, signalling a scarcity of essential minerals in the water.
- RO water was found to display TDS levels of 18 to 25 mg/l in various instances, suggesting a lack of essential minerals. This is called **"dead water,"** deemed suitable for purposes such as battery **use but not for consumption.**

➢ **Health Impacts:**

- Research suggests that RO systems can remove significant amounts of beneficial calcium and magnesium, leading to potential health issues such as **joint pain, coronary heart disease, back pain**, and vitamin **B12 deficiency**.
- Additionally, the **WHO (World Health Organization)** has highlighted cases where populations experienced health problems, including c**ardiovascular disorders and muscular cramps**, after using RO systems, indicating acute magnesium deficiency.

What are the Other Methods of Purification of Water?

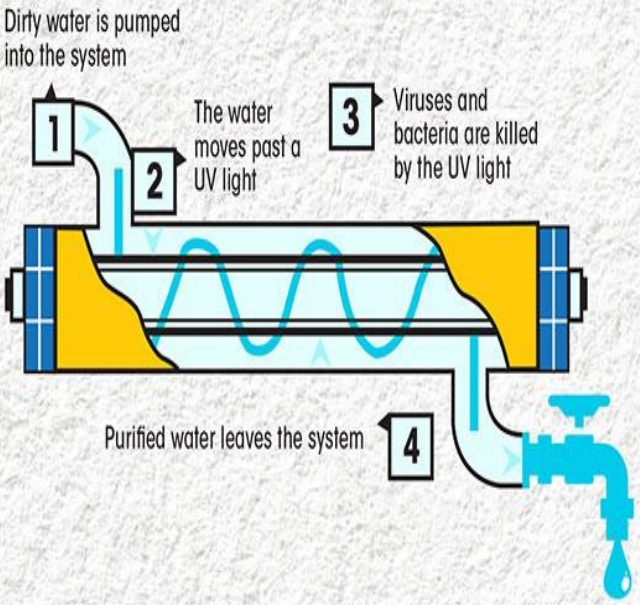




Note:

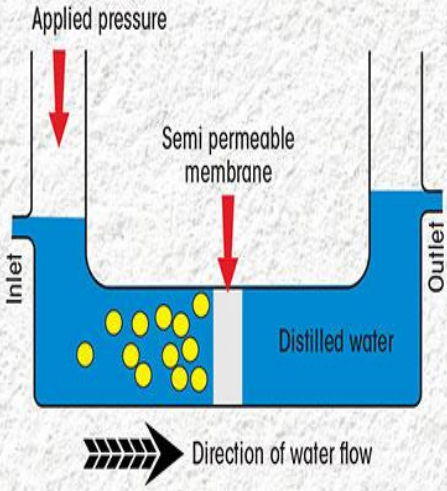
Ultraviolet purification

Targets disease-causing microbes in water, often used in conjunction with sediment-removal systems



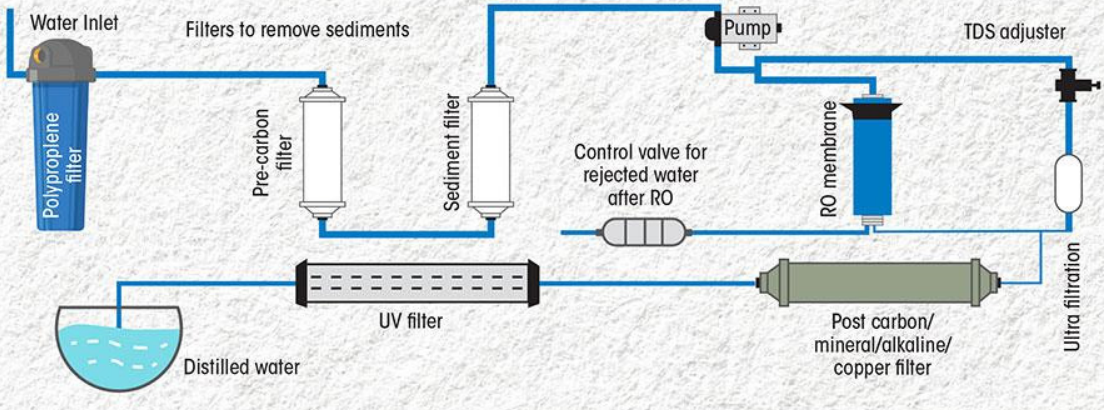
Reverse osmosis

Removes nearly all sediments and elements including essential minerals



Multi-stage purification systems

Modern purification systems come with multiple technologies, providing nearly fully distilled water



Sources: Based on communication with scientists, information from company websites

Note:

What are the Recommended TDS Limits for Safe Drinking Water?

- The **Bureau of Indian Standards (BIS)** states that the maximum TDS limit for safe drinking water is **500 milligrams per litre (ppm).**
  - However, in the absence of any alternative water source, a TDS limit of 2,000 mg/l is permissible.
- In its drinking water standards issued in **2017, WHO (World Health Organization)** states that TDS in drinking water **should be between 600 and 1,000 mg/l.**
- Countries in **Europe, the US and Canada** have set **TDS standards at 500 to 600 mg**/l.

What Technologies are Available to Address Mineral-Related Issues Within RO systems?

- To address concerns related to TDS, RO manufacturers introduced TDS controllers (or modulators) and **mineral infusion cartridges** (or mineralisers) for commercial and residential machines. TDS controllers help set TDS levels in purified water, while mineral cartridges inside the machine i**nfuse specific minerals into water as it passes.**
- Reduction of TDS also **lowers pH, which increases the acidity of water**. Hence, newer RO systems have **alkaline cartridges so compounds like bicarbonates** and hydrogen oxide can be infused.

Refrigerants

Why in News?

A recent court case in San Diego, US, highlighted the **smuggling of banned refrigerants from Mexico into the US,** shedding light on the environmental repercussions of such illicit activities.

- The refrigerants in question are **hydrofluorocarbons** and a form of hydrochlorofluorocarbons, known as **HCFC 22.**

What are Refrigerants?

- **About:** A refrigerant is a chemical substance used **in refrigeration and air conditioning systems.**
  - They work by absorbing heat and transferring it in a cycle to achieve cooling of air or objects.
  - They typically have **low boiling points,** allowing them to evaporate and cool the surrounding environment at relatively low temperatures.
  - **Example:** chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs).
- **HFCs and HCFCs:** In the 1990s, **hydrofluorocarbons (HFCs) and hydrochlorofluorocarbons (HCFCs)** gained popularity as substitutes for **chlorofluorocarbons (CFCs)** in refrigeration and air conditioning systems.
  - This shift came after research in 1985 confirmed that **CFCs were causing abnormally low ozone concentrations** above Antarctica, leading to the ozone hole phenomenon.
  - Refrigerants, including HFCs and HCFCs, are released into the atmosphere primarily when **appliances reach the end of their life** and are disposed of improperly, contributing significantly to environmental pollution.

What Measures have been Taken Globally to Reduce the Usage of Refrigerants?

- The **Vienna Convention for the Protection of the Ozone Layer (Vienna Convention)** was agreed in 1985. It established global monitoring and reporting on ozone depletion.
  - In 1987, nearly **200 countries** signed the **Montreal Protocol** aiming to halt the production and use of **ozone-depleting substances like CFCs.**
    - India became a signatory to the Montreal Protocol in 1992.
  - The Protocol mandated the **phasing out of CFCs by 1996 and HCFCs by 2030,** with HCFCs acting as a temporary solution due to their lesser impact on the ozone layer.
  - Consequently, HFCs emerged as the primary refrigerant as they do not deplete the ozone layer.
    - However, they were later recognised as **potent greenhouse gasses.**
- The **Climate and Clean Air Coalition (CCAC) report** highlighted that HFCs contribute significantly to global warming, despite having zero ozone-depleting potential.
  - In 2016, over 150 countries agreed to the **Kigali Amendment under the Montreal Protocol** aiming to **reduce HFC consumption by 80-85% by the late 2040s.**
    - **India is also signatory to the Kigali Amendment.**
    - India will complete its phase down of production and consumption of HFCs for controlled uses in 4 steps from 2032 onwards with cumulative reduction of **10% in 2032, 20% in 2037, 30% in 2042 and 85% in 2047.**

Note:

- Successful implementation of the Kigali Amendment could potentially prevent more than 0.4 of global warming by the year 2100.

Note: The Vienna Convention and its Montreal Protocol are the first and only global environmental treaties to achieve universal ratification, with **197 parties.**

Fluorochemical	Ozone Depleting Potential	Global Warming Potential
Chlorofluorocarbons (CFCs)	High	High
Hydrochlorofluorocarbons (HCFCs)	Low	High
Hydrofluorocarbons (HFCs)	Zero	High
HydrofluoroOlefin (HFOs)	Zero	Very Low

Use of Snake Venom for Intoxication

Why in News?

Recently, a few people have been arrested by the police on charges of allegedly providing snake venom for a rave party under the **Wild Life (Protection) Act, 1972,** and the **Indian Penal Code (Bharatiya Nyay Sanhita, 2023).**

What are Key Facts About Snake Venom and its Use?

- **About:**
  - Out of nearly 3400 snake species globally, **India hosts around 300 snake species** inhabiting varying habitats across the country.
- **Types of Snake:** The species falls under 4 families namely - **Colubridae, Elapidae, Hydrophiidae, and Viperidae.**
- **Venomous Snake:** Out of 300 species found in India, more than 60 are venomous, 40+ mildly venomous, and about 180 non-venomous.
  - **Snake venoms (highly toxic saliva)** are the **secretions of venomous snakes**, which are synthesised and stored in special glands.
- **Properties of Venom:** Snake venom is a complex **mixture of enzymes, peptides and proteins** of low molecular mass with specific chemical and biological activities.
  - Snake venom contains several **neurotoxic, cardiotoxic, and cytotoxic nerve growth factors,** lectins, disintegrins, haemorrhaging and many other different enzymes.
- **Use of Snake Venom:**
  - Certain particular **snake species like cobras, kraits and Black mambas** are used for **medicinal and intoxication purposes.**
  - **Medicinal use:**
    - The use of snake venom in different pathophysiological conditions has been **mentioned in Ayurveda, homoeopathy and folk medicine.**
    - It is also used for the **treatment of thrombosis, arthritis, cancer** and many other diseases.
      - One of the most well-known examples is the use of snake venom **in antivenom production.**
  - **Recreation Use**:
    - **Snake venom** is often used as a **recreational drug**, despite less scientific research. Its smuggling is a multi-million dollar illicit industry.
    - Various forms of **neurotoxin** found in cobra venom, particularly, bind on nicotinic acetylcholine receptors **(nAChRs)** that are widely distributed in the human brain area and are involved in the euphoric or rewarding experience.
      - People also **experience "muscular paralysis and analgesia"** (loss of the ability to feel pain while still conscious), and **drowsiness**.
- **Regulation:**
  - The use and trade of most psychoactive 'substances of abuse' come under the **Narcotic Drugs and Psychotropic Substances (NDPS) Act**, but **not snake venom.**
    - The NDPS Act, 1985, prohibits a person from **producing, possessing, selling, purchasing, transporting, storing, and/or consuming** any narcotic drug or psychotropic substances.
  - The matters related to snakes and their venom come under the purview of the Wildlife Protection Act.
  - **Section 120A (criminal conspiracy) of the IPC** also covers crimes related to snake venom for recreational use.

Note:

KNOW YOUR SNAKES

COMMON SAND BOA VS RUSSELL'S VIPER

Common Sand Boa
(Eryx conicus)

- Non-venomous
- 1 to 2 ft long
- Relatively small head; neck indistinct
- Conical tail
- Asymmetrical pattern

Russell's Viper
(Daboia russelii)

- Venomous
- 4 to 6 ft long
- Larger, triangular head; distinct neck
- Blunt tail
- Well defined round/oval with pointy ends

INDIAN WOLF SNAKE VS COMMON KRAIT

Indian Wolf Snake
(Lycodon aulicus)

- Non-venomous
- 1 to 2 ft long
- Round body, without ridge
- Wide bands; broad band on neck
- Scales similar throughout

Common Krait
(Bungarus caeruleus)

- Venomous
- 3 to 4 ft long
- Triangular body; ridge along spine
- Narrow bands; more prominent posteriorly
- Hexagonal vertebral scales

INDIAN RAT SNAKE VS INDIAN COBRA

Indian Rat Snake
(Ptyas mucosa)

- Non-venomous
- 6 to 8 ft long
- Doesn't form a hood
- Lower lips with black bands
- Diurnal

Indian Cobra
(Naja naja)

- Venomous
- 3 to 5 ft long
- Raises hood when threatened
- No black bands on lips
- Crepuscular and diurnal

Note:

Note:

- **Intoxicate substances act on the central nervous system** and alter an individual's mood, perception and consciousness.
  - Depending on the nature of psychoactive substances, they produce either modest type of psychological effects such as euphoria, anxiolysis, dissociation, emotional blunting, etc. or more unusual effects such as hallucination, synaesthesia, altered space-time continuum, and mystical experience.
- **Some of the most commonly used hallucinogens include** mushrooms, cannabis, mescaline, lysergic acid diethylamide (LSD), dimethyltryptamine (DMT) and methylenedioxymethamphetamine (MDMA).
- **Some of the commonly used psychoactive fauna** are hallucinogenic fish such as clownfish and Rabbitfish, amphibians such as toads, ants such as Red Harvester Ants, reptiles such as the Indian Wall Lizard, and liver and bone marrow of giraffe.

Astronomical Grand Cycles

Why in News?

A recent study published in the journal ***Nature Communications*** has found evidence of erosion in the deep sea linking **astronomical grand cycles** with the **orbits of Earth and Mars,** and **global warming or cooling.**

What are the Key Findings of the Study?

- **Astronomical Grand Cycles:**
  - Geological sedimentary evidence in the deep sea has revealed a newly discovered **2.4-million-year cycle, known as "astronomical grand cycles,"** linked with the orbits of Earth and Mars.
  - The cycle influences **global warming or cooling trends** and has been detected through **erosion patterns in deep-sea sedimentary data.**
- **Connection Between Mars' Orbit and Earth's Climate:**
  - The **gravity fields of planets in the solar system** interfere with each other, leading to changes in their **orbital eccentricity (how circular their orbits are).**
    - The interaction between Earth and Mars' orbits causes variations in the **amount of solar radiation received by Earth,** resulting in **cycles of warming and cooling over 2.4 million years.**
- **Impact on Climate and Ocean Circulation:**
  - The vigorous deep-sea circulation driven by **eddies (a circular current of water)** during warmer cycles could potentially **prevent ocean stagnation,** even if the **Atlantic Meridional Overturning Circulation (AMOC) slows or stops functioning.**
    - AMOC is a large system of ocean currents that carry warm water from the tropics northwards into the North Atlantic.
  - Deep ocean eddies could help provide oxygen to the deep ocean and draw carbon dioxide from the **atmosphere** into the ocean in a warmer world.
    - Intense deep-ocean eddies, described as giant whirlpools, play a vital role in **ocean circulation dynamics,** these sit at depths of 3,000 to 6,500 meters and where sunlight doesn't penetrate.
    - These **eddies contribute to seafloor erosion** and the formation of large sediment accumulations known as **contourites,** resembling snowdrifts in their structure.
- **Future Research Directions:**
  - The team plans to gather more data showcasing cycles driven by Earth-Mars interaction, further exploring the dynamics of Earth's climate fluctuations over millions of years.

What are Astronomical Cycles?

- Astronomical cycles refer to **periodic variations in the Earth's orbit and orientation towards the Sun** that impact the amount of solar radiation received by our planet over long periods.
  - These cycles are caused by the **gravitational forces between the Earth, Sun, and other planets** in the solar system.
- These cycles were first theorised by **Serbian scientist Milutin Milankovitch** in the 1920s to explain the cyclical patterns of ice ages on Earth also called **Milankovitch cycles, or Milankovitch oscillations.**
  - Some key astronomical cycles include
    - **Eccentricity** (100,000 years) - Changes in the elliptical shape of Earth's orbit around the Sun.
    - **Obliquity** (41,000 years) - Variations in the tilt of Earth's axis relative to its orbital plane.
    - **Precession** (23,000 years) - The shifting orientation of **Earth's axis over time.**

Note:

What are the Other Astronomical Influences on Earth's Climate?

- **Sunspot Activity:**
  - Sunspots are **dark and cooler patches on the sun** that increase and decrease in a cyclical manner.
    - The number and intensity of sunspots increase and decrease in a cyclical pattern, typically over an **11-year solar cycle.**
  - According to some meteorologists, **higher sunspot activity** and numbers are associated with:
    - **Cooler and wetter weather patterns on Earth** and increased storminess and cloud cover.
    - Conversely, periods with **fewer sunspots** are linked to **Warmer and drier** conditions globally.
  - However, these **correlations between sunspot activity and specific weather patterns are not consistently** supported by statistically significant evidence.
- **Galactic Cosmic Rays:**
  - Some studies suggest that increased **cosmic ray flux from our galaxy** could influence cloud formation on Earth, potentially leading to cooling effects.
    - However, the magnitude of this effect and the mechanisms involved **are still subjects of ongoing research.**
- **Asteroid/Comet Impacts:**
  - Major **asteroid or comet** impacts on Earth, while extremely rare, can inject **massive amounts of dust and gasses** into the atmosphere, leading to temporary cooling periods.
  - The **Cretaceous-Paleogene extinction (caused extinction of dinosaurs)** around 66 million years ago is thought to have been caused in part by an asteroid impact and associated climate changes.

■■■

Note:

Environment and Ecology

Highlights

- *Low-Carbon Action Plan (LCAP)*
- *Black Carbon Emissions and PMUY*
- *Challenges of Handling Nuclear Waste*
- *Global E-waste Monitor 2024*
- *Plastic Waste Management (Amendment) Rules, 2024*
- *Climate Finance Road to COP29*
- *Sundarbans*
- *Environmental Protection Charge*
- *Great Indian Bustards*
- *Captive Elephant (Transfer or Transport) Rules, 2024*
- *Global Methane Tracker 2024*
- *World Sparrow Day 2024*
- *State of the Global Climate 2023: WMO*
- *World Air Quality Report 2023*
- *Forest Fires*
- *IPCC Reports and Equity in Climate Change Mitigation*
- *BBNJ Treaty*

Note:

Low-Carbon Action Plan (LCAP)

Why in News?

Bihar has initiated a **well-designed work plan to strengthen its waste management** profile by formulating a **Low-Carbon Action Plan (LCAP)** for the waste and domestic wastewater sector.

- This is part of its commitment to transform itself into a **Net Zero state by 2070.**
- The detailed assessment, done by **ICLEI (International Council for Local Environmental Initiatives)**, South Asia, of the waste and wastewater sectors constitutes a critical part of the strategy.
  - ICLEI is a network of more than 2500 local and regional governments, supported by a team of global experts, driving sustainable urban development worldwide.
  - ICLEI influences **sustainability policy and drives local actio**n for low emission, nature-based, equitable, resilient and circular development.

What is the Low Carbon Action Plan (LCAP)?

- **About:**
  - The LCAP is a strategic document **developed to address the challenges of Greenhouse Gas (GHG) emissions** and promote **sustainable waste management practices.**
  - Specifically tailored to Bihar, the LCAP outlines a comprehensive roadmap for reducing emissions from the waste and domestic wastewater sectors, thereby contributing to the **state's goal of becoming carbon neutral by 2070.**
- **Components:**
  - **Assessment and Inventory:** The LCAP begins with a **thorough assessment of the existing waste management** infrastructure, including both the solid waste and domestic wastewater sectors.
    - This involves collecting **data on waste generation**, treatment methods, and GHG emissions.
  - **Identification of Key Issues:** The LCAP identifies key challenges in waste management, such as inadequate sewage collection and treatment, **poor waste segregation**, and unmanaged solid waste disposal.
  - **Setting Targets and Goals:** Based on the assessment, the LCAP establishes ambitious targets for emission reductions and waste management improvements.
    - These targets are set for different timeframes, including **2030, 2050, and 2070**.
  - **Intervention Strategies:** The LCAP proposes a range of low-carbon interventions and recommendations to address the identified issues.
    - These strategies include improving waste segregation at the source, enhancing collection and transportation systems, implementing efficient treatment technologies, and promoting methane recovery from wastewater.
  - **Community Engagement and Policy Enforcement:** The success of the LCAP relies on active participation from various stakeholders, including government agencies, local communities, and private sector entities. Additionally, policy-driven enforcement mechanisms are essential to ensure compliance with waste management regulations and promote sustainable practices.

What are the Benefits of LCAPs?

- **Environmental Benefits:** The main advantage is combating climate change by reducing emissions that trap heat in the atmosphere. This can help slow global warming and its associated problems like extreme weather events, rising sea levels, and harm to ecosystems.
- **Public health Benefits:** Reducing reliance on fossil fuels like coal can improve air quality, leading to less respiratory illness. Low carbon plans often encourage things like walking, cycling, and public transport, which can boost physical activity levels.
- **Economic Benefits:** Investing in renewable energy sources and energy efficiency can create new jobs in these sectors. There can also be long-term cost savings from reduced reliance on imported fossil fuels.

What are the Challenges of LCAP?

- **Upfront Costs:** Shifting to renewable energy sources or energy-efficient technologies often requires an initial investment.
- **Changing Habits:** The plan might require changes in how people live and work, such as using public transport more or driving less. People may be resistant to these changes.

Note:

- **Political Will:** Low carbon plans can take time and sustained effort to show results. There may be political resistance to changes that could disrupt powerful industries.
- **Equity Concerns:** The transition to a low carbon economy needs to be managed fairly to ensure that everyone benefits and the burden isn't placed unequally on disadvantaged groups.

What are the Initiatives Related to Waste Management in India?

- **Solid Waste Management Rules 2016:**
  - These rules replaced the Municipal Solid Wastes (Management and Handling) Rules, 2000 and focused on segregation of waste at source, responsibility on the manufacturer to dispose of sanitary and packaging wastes, user fees for collection, disposal and processing from the bulk generator.
- **Waste to Wealth Portal:**
  - It aims to identify, develop, and deploy technologies to treat waste to generate energy, recycle materials, and extract resources of value.
- **Waste to Energy:**
  - A waste-to-energy or energy-from-waste plant converts municipal and industrial solid waste into electricity and/or heat for industrial processing.
- **Plastic Waste Management (PWM) Rules, 2016:**
  - It mandates the generators of plastic waste to take steps to minimize generation of plastic waste, prevent littering of plastic waste, and ensure segregated storage of waste at source among other measures.
  - In Feb 2022, **Plastic Waste Management (Amendment) Rules, 2022** were notified.
- **Project REPLAN:**
  - It aims to make carry bags by mixing processed and treated plastic waste with cotton fibre rags in the ratio 20:80.
- **Plastic Waste Management (Amendment) Rules, 2022:**
  - The rules specify the responsibilities of various stakeholders such as manufacturers, importers, retailers, and consumers. All these stakeholders have a role to play in ensuring that plastic waste is managed properly and does not end up polluting the environment.

Black Carbon Emissions and PMUY

Why in News?

During the **UNFCCC COP26 climate talks** in **Glasgow** in **November 2021,** India committed to attaining **net-zero emissions** by **2070,** positioning itself as a leading contender in the pursuit of **carbon neutrality.**

- As per the **Ministry of New and Renewable Energy,** India has established a renewable energy capacity surpassing **180 GW by 2023** and is on track to achieve its goal of reaching **500 GW by 2030.**
- **Pradhan Mantri Ujjwala Yojana (PMUY),** a scheme of the government of India can contribute to **net zero emission** significantly by mitigating the black carbon emission.

What is Black Carbon (BC)?

- **About:**
  - **Black carbon (BC)** is the **dark, sooty material** emitted alongside other pollutants when **biomass** and **fossil fuels** are not fully combusted.
  - BC is a short-lived pollutant that is the second-largest contributor to warming the planet behind **carbon dioxide (CO2).**
    - Unlike other **greenhouse gas emissions,** BC is quickly washed out and can be eliminated from the atmosphere if emissions stop.
    - Unlike historical carbon emissions it is also a localised source with greater local impact.
    - Black carbon is a kind of an aerosol.
- **Impacts:**
  - Among aerosols (such as brown carbon, sulphates), Black Carbon has been recognized as the second most important anthropogenic agent for **climate change** and the primary marker to understand the adverse effects caused by **air pollution.**
    - Black carbon absorbs solar energy, it warms the atmosphere. When it falls to earth with precipitation, it darkens the surface of snow

Note:

and ice, reducing their albedo (the reflecting power of a surface), warming the snow, and hastening melting.

- It contributes to **global warming** and poses severe risks. Studies have found a direct link between exposure to **black carbon** and a higher risk of **heart disease**, **birth complications,** and **premature death.**

➢ **Source:**

- Most **black carbon emissions** in India arise from **burning biomass,** such as **cow dung** or **straw**, in traditional **cookstoves.**
- It gets emitted from **gas** and **diesel engines, coal-fired power plants,** and other sources that burn **fossil fuel.** It comprises a significant portion of **particulate matter (PM).**
- According to a 2016 study, the **residential sector** contributes **47%** of India's total black carbon emissions.
- Industries contribute a further **22%, diesel vehicles 17%, open burning 12%,** and other sources **2%.**

What is Pradhan Mantri Ujjwala Yojana (PMUY)?

➢ **About:**

- The Ministry of Petroleum and Natural Gas (MoPNG), introduced the **'Pradhan Mantri Ujjwala Yojana' (PMUY)** in 2016 as a flagship scheme with the objective of making clean cooking fuel such as LPG available to the rural and deprived households which were otherwise using traditional cooking fuels such as firewood, coal, cow-dung cakes etc.
  - Usage of traditional cooking fuels had detrimental impacts on the health of rural women as well as on the environment due to huge emission of particulate matter and black carbon.

➢ **Objectives:**

- Reducing the number of deaths in India due to unclean cooking fuel which emits more black carbon.
- Preventing young children from a significant number of acute respiratory illnesses caused due to indoor air pollution by burning fossil fuel and black carbon emission.
- To make clean cooking fuel available to rural and poor households and reduce their dependence on traditional cooking fuels.
- To set up infrastructure to accompany LPG connections, which includes providing complimentary gas stoves, deposits for LPG cylinders, and establishing a distribution network.

➢ **Features:**

- The scheme provides a financial support of **Rs 1600 for each LPG connection** to the BPL households.
- Along with a deposit-free LPG connection, **Ujjwala 2.0** provides the first refill and a hotplate free of cost to the beneficiaries.

➢ **Challenges of the Scheme in BC Emission Mitigation:**

- **Energy Needs and Traditional Fuels:** Up to half of the energy needs of households benefiting from the PMUY are still met by traditional fuels, emitting high levels of black carbon.
  - In 2022-23, **25%** of all **PMUY beneficiaries** availed either **zero LPG refill** or only **one LPG refill,** according to **RTI data,** meaning they still relied entirely on **traditional biomass** for cooking which aggravates the emission of black carbon.
- **Impact on Health and Well-being:** A shortage of LPG and increased reliance on traditional fuels disproportionately affects women and children, leading to elevated indoor air pollution due to black carbon and other pollutants, health concerns, and premature deaths.
- **LPG Subsidy and Affordability:** In October 2023, the government increased the LPG subsidy to ₹300 from ₹200. However, despite this adjustment, the cost of a 14.2-kg LPG cylinder remains around ₹600, posing affordability challenges for many PMUY beneficiaries compared to free alternatives like cow dung and firewood.
  - Cow dung and firewood are more affordable to PMUY beneficiaries so its use is more prevalent, intensifying the problem of black carbon.
- **Last-Mile Connectivity Hindrance:** The lack of last-mile connectivity in the LPG distribution network poses a significant challenge to the success of PMUY in reducing the black carbon emission, especially impacting remote rural areas heavily reliant on biomass burning which is a significant source of black carbon.

Note:

Other Measures Taken to Mitigate Black Carbon Emission

- **Introducing Cleaner Fuels:** Introduction of cleaner / alternate fuels like gaseous fuel (CNG, LPG etc.), ethanol blending.
- **SATAT Scheme:** A new initiative Sustainable Alternative Towards Affordable Transportation (SATAT), has been launched to set up 5000 Compressed Bio-Gas (CBG) production plants and make CBG available in the market for use.
- **Managing Crop Residue:** Agricultural machines and equipment for in-situ crop residue management in Punjab, Haryana, Uttar Pradesh and NCT of Delhi are promoted under the Central Sector Scheme on Promoting Agricultural Mechanization for in-situ Crop Residue Management with 50% subsidy to individual farmers and 80% subsidy to the establishment of Custom Hiring Centers.
- **National Clean Air Programme:** Under the National Clean Air Programme, the government has set a new target: a **40%** reduction in particulate matter concentration in covered cities by **2026,** surpassing the previous goal of **20 to 30%** reduction by **2024**.
- **City specific Clean Air Action Plans:** The CPCB has identified 131 cities based on ambient air quality levels exceeding national ambient air quality standards, and cities with a million plus population.
  - These plans define time bound targets to control city specific air polluting sources (soil & road dust, vehicles, domestic fuel, municipal solid waste burning, construction material and industries, etc.).
- **FAME Scheme:** Faster Adoption and Manufacturing of Electric Vehicles (FAME) phase-2 scheme has been rolled out.

Challenges of Handling Nuclear Waste

Why in News?

Recently, India loaded the core of its long-delayed prototype fast breeder reactor (PFBR) vessel, bringing it to the cusp of stage II — powered by **uranium and plutonium** — of its three-stage nuclear programme.

- By **stage III**, India hopes to be able to **use its vast reserves of thorium** to produce nuclear power.
- Managing nuclear waste poses a significant challenge due to the widespread use of nuclear power.

Prototype Fast Breeder Reactor (PFBR)

- A breeder reactor is a nuclear reactor that **generates more fissile material than it consumes** by irradiation of fertile material, such as Uranium-238 or Thorium-232 that is loaded into the reactor along with fissile fuel.
- These are designed to extend the nuclear fuel supply for electric power generation.
- PFBR is a 500-megawatt electric (MWe) fast-breeder nuclear reactor presently being constructed at the Madras Atomic Power Station in Kalpakkam (Tamil Nadu).
  - It is fuelled by Mixed Oxide (MOX) Fuel.

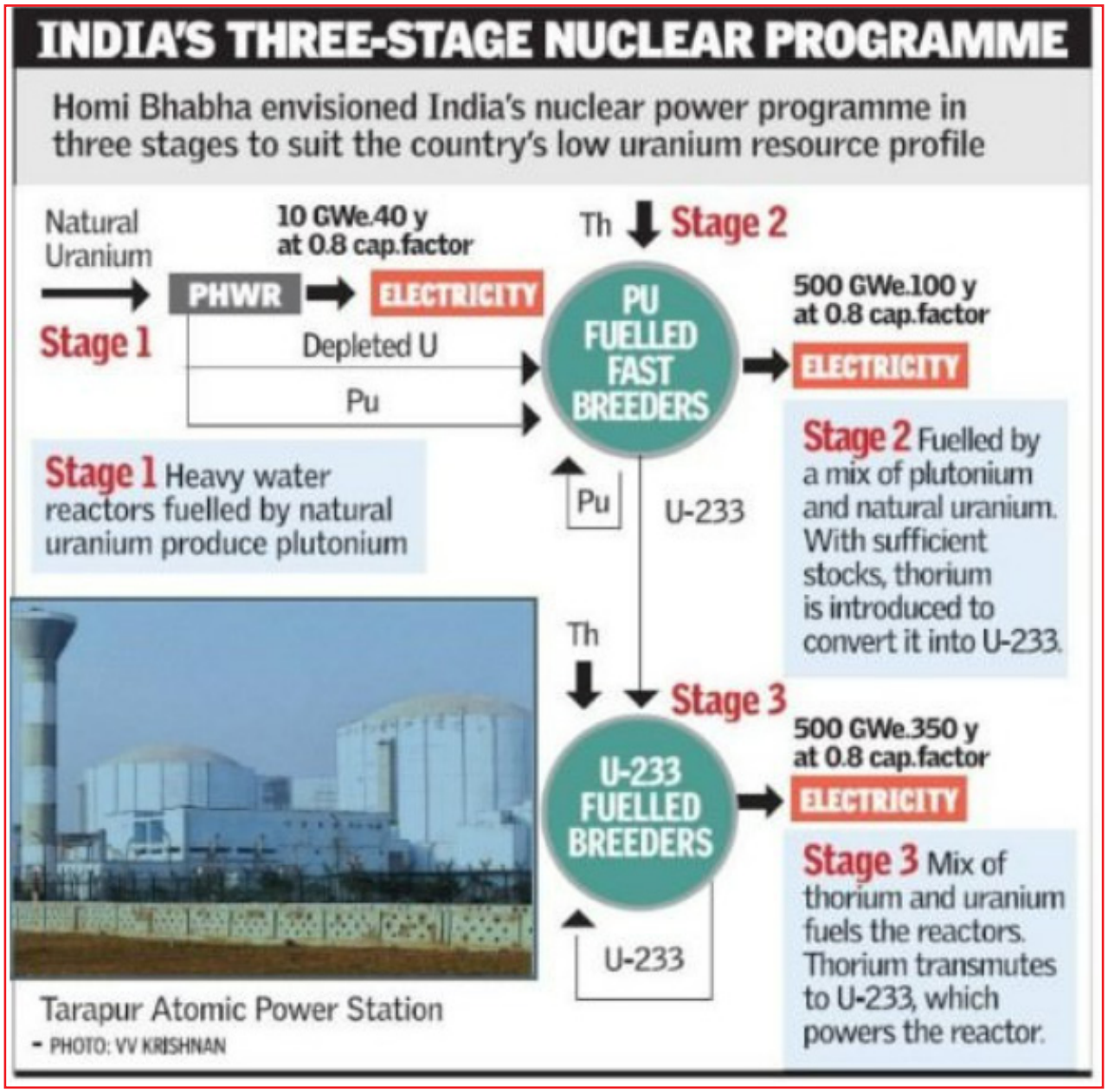
What is Nuclear Waste?

- In a **fission reactor**, **neutrons bombard the nuclei of atoms of certain elements.** When one such nucleus absorbs a neutron, it destabilises and breaks up, yielding some energy and the nuclei of different elements.
  - **For example,** when the **uranium-235 (U-235)** nucleus absorbs a neutron, it can fission to **barium-144, krypton-89, and three neutrons.** If the **'debris' (barium-144 and krypton-89)** constitute elements that can't undergo fission, they become nuclear waste.
  - Fuel loaded into a nuclear reactor becomes irradiated and must eventually be removed, at which point it is known as **spent fuel.**
- Nuclear waste is **highly radioactive** and needs to be **stored in facilities reinforced to prevent leakage** into and/or contamination of the local environment.

Note:

- Fission is a process in which the nucleus of an **atom splits into two or more smaller nuclei** and some byproducts.
  - When the **nucleus splits, the kinetic energy** of the fission fragments (primary nuclei) is transferred to other atoms **in the fuel as heat energy,** which is eventually used to produce steam to drive the turbines.
- Fusion is defined as the **combining of several small nuclei into one large nucleus** with the subsequent release of huge amounts of energy.
  - Harnessing fusion, **the process that powers the Sun** could provide a limitless, clean energy source.
    - In the sun, the extreme pressure produced by its immense gravity creates the conditions for fusion to happen.

Note:



How can Nuclear Waste be Managed Safely and Effectively?

- The primary challenge is managing **spent fuel,** which is hot and radioactive. It must be **submerged in water for several decades before it can be transferred to dry casks** for long-term storage once it has cooled.
  - All countries with longstanding nuclear power programmes have accumulated a considerable inventory of spent fuel.
  - For example, the **US had 69,682 tonnes (tn)**, **Canada 54,000 tn**, and **Russia 21,362 tn.**
- Depending on radioactivity levels, **the storage period can run up to a few millennia (1000 years),** as they have to be isolated from human contact for periods of time that are longer than anatomically modern **Homo sapiens** have been around on the planet.
  - Nuclear power plants also have **liquid waste treatment facilities.**
    - Japan is currently discharging, after treatment, such water from the **Fukushima nuclear power plant** into the Pacific Ocean.

Note:

- Other such waste, depending on their hazard, can be evaporated or "chemically precipitated" which means the sludgy substance can be managed by either being soaked up by solid materials or burned.
- **Liquid high-level waste** contains "almost all of the fission products produced in the fuel". It is **vitrified to form a storable glass.**

- Some experts advocate for **geological disposal, where the waste is sealed in special containers and buried underground in granite or clay.**
- Another way to deal with the **spent fuel is Reprocessing** — which separates fissile from non-fissile material in spent fuel.
  - The material is chemically treated to separate fissile material left behind from the non-fissile material.
  - Because spent fuel is so hazardous, reprocessing facilities need specialised protections and personnel of their own.
  - Such facilities present the **advantage of higher fuel efficiency** but are also expensive.
  - Reprocessing also yields weapons-usable (different from weapons-grade) plutonium.
    - **Weapons-grade plutonium is highly pure,** ideal for efficient and compact nuclear weapons.
    - Weapons-usable plutonium, including **reactor-grade or from dismantled weapons,** may require more material or special designs, impacting efficiency and design options.

What are the Challenges in Managing Nuclear Waste?

- **Geological Disposal Leakage:** The **geological disposal of nuclear waste** poses the **risk of radioactive material** being exposed to humans in the event that containers are disturbed, for instance, **through nearby excavation activities.**
  - **Example:** Waste Isolation Pilot Plant, US, has a licence to store waste for a few millennia. In 2014, an **accident at the site released small quantities of radioactive materials into the environment,** revealing serious failures in its maintenance.
- **Exclusion of Private Sector:** Private sector involvement often drives innovation through competition and market incentives. **Without private sector participation**, there may be **less incentive to develop new technologies and processes** for more efficient and effective nuclear waste treatment.
- **Unutilized Fund:** The US's **Nuclear Waste Policy Act of 1982** mandated that a portion of electricity generated from nuclear power be allocated to a **'Nuclear Waste Fund,'** which would finance a geological disposal facility.
  - Despite amassing a corpus of USD 40 billion as of July 2018, **the fund has faced criticism for remaining unutilized for its intended purpose.**
- **Lack of International Cooperation:** Stakeholders often lack cooperation, hindering effective management of nuclear waste. As nuclear waste is a global issue, international collaboration is essential to share knowledge, develop best practices, and ensure responsible management across all countries utilizing nuclear energy.

How does India handle nuclear waste?

- According to a 2015 report from the **International Panel on Fissile Materials (IPFM),** India has reprocessing plants in **Trombay, Tarapur, and Kalpakkam.**
  - The **Trombay facility** reprocesses 50 tonnes of heavy metal per year (tHM/y) as spent fuel from two research reactors **to produce plutonium for stage II reactors as well as nuclear weapons.**
  - Of the **two in Tarapur,** one used to reprocess 100 tHM/y of fuel from some **pressurised heavy water reactors (stage I)** and the other, commissioned in 2011, has a capacity of 100 tHM/y.
  - The third facility in **Kalpakkam processes 100 tHM/y.**
- The report also suggested the **Tarapur and Kalpakkam facilities** operate with a combined **average capacity factor of around 15%.**

Global E-waste Monitor 2024

Why in News?

Recently, the **United Nations Institute for Training and Research (UNITAR)** has released the ***Global E-waste Monitor 2024***, which states that the world's generation of electronic waste is rising five times faster than documented **e-waste recycling**.

Note:

- The UNITAR is a **training arm of the United Nations** that helps governments, organisations, and individuals overcome global challenges.
- UNITAR offers **learning events and solutions**, including workshops, seminars, conferences, public lectures, and online courses. It also provides organisational advisory services, conference and retreat facilitation, and online learning solutions.

Note:

What are the Key Highlights of the Global E-waste Monitor 2024 Report?

- **E-waste Generation Trends:**
  - There is a **significant increase in global e-waste generation**, rising from 34 billion (bn) kg in **2010 to 62 bn kg in 2022**.
    - This trend is projected to continue, **reaching 82 bn kg by 2030.**
  - Of this 62 bn kg, only 13.8 bn kg is documented as '**formally collected and recycled in an environmentally** sound manner'.
    - 62 bn kg of e-waste includes 31 bn kg of metals, 17 bn kg of plastics and 14 bn kg of other materials (minerals, glass, composite materials, etc.)
- **Drivers of E-waste Generation:**
  - Factors driving the increase in e-waste generation include **technological progress**, higher consumption rates, limited repair options, short product life cycles, growing electronification, and inadequate e-waste management infrastructure.
- **Informal Recycling Sector:**
  - A significant portion of e-waste (both in high- and upper-middle-income countries as well as low- and lower-middle-income countries) is handled by the **informal sector due to inadequate formal e-waste management** infrastructure.
- **Environmental and Health Impacts:**
  - The improper management of e-waste, including informal recycling practices, leads to the release of hazardous substances such as mercury and plastics containing **brominated flame retardants into the environment**, posing direct and severe impacts on both the environment and public health.
    - A brominated flame retardant is a chemical compound containing bromine that is added to materials to inhibit or suppress the ignition and spread of fires.
    - They work by interfering with the combustion process, **reducing the flammability of materials** and slowing down the rate at which flames spread.
  - A whopping 58,000 kg of mercury and **45 million kg of plastics containing brominated flame** retardants are released into the environment every year.
- **Regional Disparities:**
  - Europe has the highest rate of documented formal collection and recycling of e-waste (42.8%), while Africa **struggles with low recycling rates** (<1%) despite generating lower amounts of e-waste.
  - Asia, including India, generates a **significant portion of global e-waste** but has made limited advances in e-waste management.
    - Countries in Asia generate **almost half of the world's e-waste (30 bn kg)** but relatively few of them have enacted legislation or established clear e-waste collection targets.
- **Per Capita E-waste Generation and Recycling Rates:**
  - Europe (17.6 kg), Oceania (16.1 kg) and the Americas (14.1 kg) generated the highest amount of e-waste per capita in 2022.
    - They also had the **highest documented per capita collection** and recycling rates (7.53 kg per capita in Europe, 6.66 kg per capita in Oceania and 4.2 kg per capita in the Americas).
    - This was because their collection and **recycling infrastructure was the most advanced.**
- **Recycling Rates by Equipment Type:**
  - Collection and recycling rates are highest for heavier and bulkier equipment like **temperature exchange equipment** and screens and monitors.
  - Thus, while toys, microwave ovens, vacuum cleaners and e-cigarettes comprise a third (20 bn kg) of the world's e-waste, recycling **rates for them are very low 12% globally.**
    - Small IT and telecommunication equipment — laptops, mobile phones, GPS devices and routers — constitute 5 bn kg of e-waste.
    - But just 22% of this is **documented as formally collected and recycled.**
- **Policy Adoption:**
  - 81 countries have adopted e-waste policy, legislation or regulation.
  - Sixty-seven countries have legal provisions on Extended Producer Responsibility (EPR) for e-waste.
  - Another 46 have provisions on e-waste collection rate targets. Finally, 36 countries have provisions on e-waste recycling rate targets.

What is an e-Waste?

- Electronic waste (e-waste), is a generic term used to describe **all types of old, end-of-life or discarded electrical and electronic equipment**, such as household appliances, office information and communications equipment etc.
  - E-waste contains numerous toxic chemicals including metals such as lead, cadmium, **mercury, and nickel.**
- India currently ranks **third among the largest generators of e-waste globally**, behind only China and the US.

Note:

- The volume of e-waste in India has witnessed a significant surge to 1.6 million tonnes in 2021-22.
- The 65 cities in India generate more than 60% of the total generated e-waste, whereas 10 states generate 70% of the total e-waste.

What are the Provisions regarding E-waste Management in India?

- In 2011, a significant notice pertaining to the E-waste (Management and Handling) Regulations of 2010, governed by the Environment (Protection) Act of 1986, was issued.
  - **Extended producer's responsibility (EPR)** was its main feature.
- **E-waste (Management) Rules, 2016** were introduced with over 21 products (Schedule-I) included under the purview of the rule.
  - It included Compact Fluorescent Lamp (CFL) and other mercury containing lamps, as well as other such equipment.
- Government of India notified **E-Waste (Management) Rules, 2022** with a major aim to digitise the e-waste management process and enhance visibility.
  - It also restricts the use of hazardous substances (such as lead, mercury, and cadmium) in manufacturing electrical and electronic equipment that have an adverse impact on human health and the environment.
- A **Deposit Refund Scheme** has also been introduced as an additional economic instrument wherein the producer charges an additional amount as a deposit at the time of sale of the electrical and electronic equipment and returns it to the consumer along with interest when the end-of-life electrical and electronic equipment is returned.

Plastic Waste Management (Amendment) Rules, 2024

Why in News?

The Ministry of Environment, Forest and Climate Change of India has recently introduced amendments to the **Plastic Waste Management Rules, 2016,** through the **Plastic Waste Management (Amendment) Rules, 2024.**

- These changes signify a significant effort to address plastic pollution in India, particularly by **targeting microplastics and setting stricter criteria for biodegradable plastics.**

What are the Key Highlights of the Plastic Waste Management (Amendment) Rules 2024?

- **Biodegradable Plastics:**
  - Biodegradable plastics are now defined as materials **capable of degradation by biological processes** in specific environments like soil and landfill, **without leaving any microplastics.**
    - **Microplastics** are defined as any **solid plastic particle insoluble in water,** with dimensions between 1 micron and 1,000 microns (1 micron is one-thousandth of a millimetre).
      - In recent years, they have been reported as a major source of pollution affecting rivers and oceans.
- **Microplastics Testing:**
  - The rules **do not specify which chemical tests** can establish the absence of microplastics or the extent to which microplastics must be reduced for elimination.
- **Expanded Definition of "Importer":**
  - The definition now includes **imports of various plastic-related materials** such as packaging, carry bags, sheets, raw materials, and intermediate materials used in plastic manufacturing for commercial purposes.
    - **Earlier, "importer" referred** to someone who imported plastic packaging, products with plastic packaging, carry bags, multilayered packaging, plastic sheets, or similar items.
- **Inclusive Definition of "Manufacturer":**
  - The scope now encompasses those engaged in the **production of plastic raw materials, compostable plastics, and biodegradable plastics,** reflecting a broader range of entities covered under this term.
- **Extended Scope of "Producer":**
  - Beyond manufacturing plastic packaging, it now includes the production of intermediate materials used in plastic packaging and contract manufacturing for brand owners.
- **Certification Requirement:**
  - Manufacturers are allowed to produce carry bags and commodities from **compostable or biodegradable plastics,** and must obtain a certificate from the **Central Pollution Control Board (CPCB)** before marketing or selling their products.

Note:

Note:

- There are two categories of microplastics: **primary and secondary.**
  - **Primary microplastics** are tiny particles designed for commercial use and microfibers shed from clothing and textiles, such as **microbeads** found in personal care products, plastic pellets, and plastic fibres.
  - **Secondary microplastics** are formed from the **breakdown of larger plastics**, such as water bottles, caused by exposure to environmental factors like the sun's radiation and ocean waves.
- Microplastics act as carriers for **various chemicals, antibiotic-resistant bacteria, and pathogens**, posing risks to **aquatic life and human health** if they bypass the water treatment process.

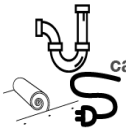
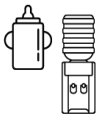
What are Biodegradable Plastics and Compostable Plastics?

	Biodegradable Plastic	Compostable Plastic
Definition	Defined as materials capable of degradation by biological processes in specific environments such as soil or landfill. Biodegradation depends on factors like temperature, presence of microorganisms, nutrients, oxygen, and moisture.	Designed to biodegrade in the conditions of an industrial composting plant or an industrial anaerobic digestion plant with a subsequent composting step.
Environmental Benefit	Can reduce reliance on fossil fuels if made from biobased sources.	Reduces waste for specific applications such as take-out containers
Potential Harm	If not managed properly, it may not biodegrade as intended, leading to environmental damage.	If not composted in appropriate conditions, can have the same consequences as non-biodegradable plastics, contributing to plastic pollution.

Note:

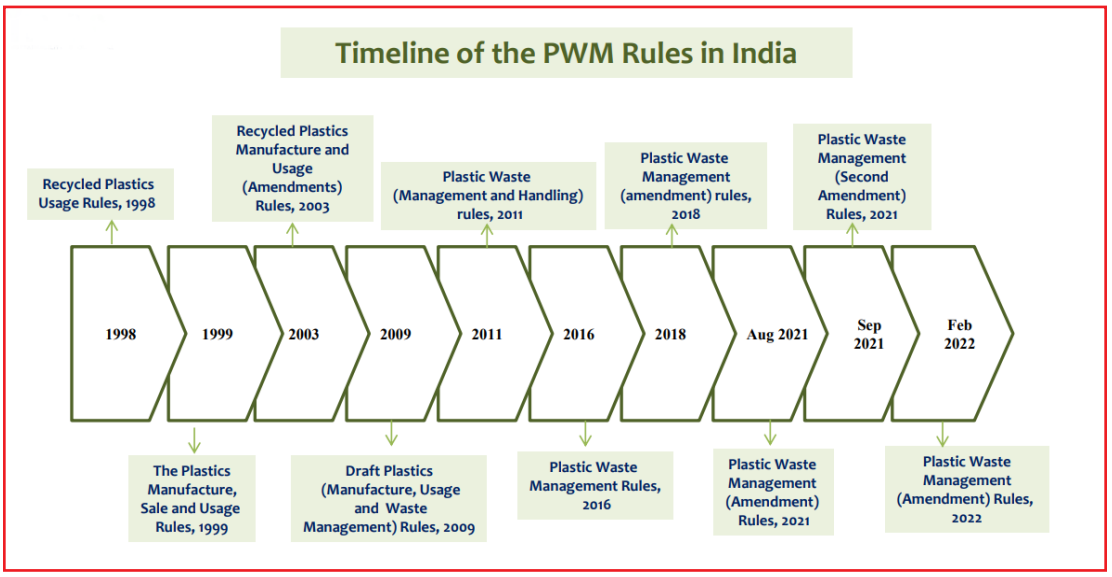
Which plastics are recyclable?

Summary of plastic polymer groups, their common uses, properties and recyclability. Numerical coding (from 1-7) is typically provided on plastic items and gives information of their polymer grouping below. Recyclability is based on common recycling schemes but can vary between countries as well as regionally within countries; check local recycling guidelines for further clarification.

Symbol	Polymer	Common Uses	Properties	Recyclable?
1 PETE	Polyethylene terephthalate	 Plastic bottles (water, soft drinks, cooking oil)	Clear, strong and lightweight	Yes; widely recycled
2 HDPE	High-density polyethylene	 Milk containers, cleaning agents, shampoo bottles, bleach bottles	Stiff and hardwearing; hard to breakdown in sunlight	Yes; widely recycled
3 PVC	Polyvinyl chloride	 Plastic piping, vinyl flooring, cabling insulation, roof sheeting	Can be rigid or soft via plasticizers; used in construction, healthcare, electronics	Often not recyclable due to chemical properties; check local recycling
4 LDPE	Low-density polyethylene	 Plastic bags, food wrapping (e.g. bread, fruit, vegetables)	Lightweight, low-cost, versatile; fails under mechanical and thermal stress	No; failure under stress makes it hard to recycle
5 PP	Polypropylene	 Bottle lids, food tubs, furniture, houseware, medical, rope, automobile parts	Tough and resistant; effective barrier against water and chemicals	Often not recyclable; available in some locations; check local recycling
6 PS	Polystyrene	 Food takeway containers, plastic cutlery, egg tray	Lightweight; structurally weak; easily dispersed	No; rarely recycled but check local recycling
7 OTHER	Other plastics (e.g. acrylic, polycarbonate, polyactic fibres)	 Water cooler bottles, baby cups, fiberglass	Diverse in nature with various properties	No; diversity of materials risks contamination of recycling

Note:

What are the Recent Plastic Waste Management Rules in India?



What are the other Initiatives taken to Curb Plastic Waste?

- Swachh Bharat Mission
- India Plastics Pact
- Project REPLAN
- Un-Plastic Collective
- GoLitter Partnerships Project

Central Pollution Control Board (CPCB)

- The CPCB was constituted in **1974 under the** Water (Prevention and Control of Pollution) Act, 1974.
- CPCB was also entrusted with powers and functions under the **Air (Prevention and Control of Pollution) Act, 1981.**
  - It serves as a field formation and provides technical services to the **Ministry of Environment and Forests.**
- Principal functions include promoting the cleanliness of streams and wells, improving air quality, and preventing, controlling, or abating water and air pollution.

Climate Finance Road to COP29

Why in News?

The **UN Climate Change Conference (UNFCCC COP 27) convened in Sharm El-Sheikh, Egypt** established a **Loss and Damage Fund** for **climate disaster recovery** in developing nations.

- The **2023 UNFCCC COP 28 (Dubai)** focused on transitioning from **fossil fuels,** pledging to **triple renewable energy capacity by 2030.**
- As preparations for COP29 in Baku intensify, attention now turns to finance discussions, particularly the **New Collective Quantitative Goal (NCQG).**

What is the New Collective Quantitative Goal?

- The NCQG is a new annual **financial target that developed countries must meet from 2025** onward to provide climate finance to developing countries.
  - It will replace the previous commitment of **USD 100 billion per year** that developed nations had pledged in 2009 but failed to deliver.
- The final NCQG amount is expected to be a central point of negotiation at the **COP29 summit in Baku, Azerbaijan, in November 2024.**
  - The NCQG negotiations aim to set a higher collective amount that wealthy countries will need to mobilise annually for mitigation, adaptation, and other climate action efforts in poorer nations vulnerable to the impacts of climate change.
- Securing an adequate NCQG figure is extremely important for developing countries, as a **lack of sufficient climate finance has been a major barrier** to implementing effective climate plans and building resilience against global warming's effects.

How Much Money is Needed for Effective Climate Action?

- Global climate action faces a significant hurdle due to inadequate financing, especially in developing countries.

Note:

- Annual climate finance flows fall far short of the promised USD 100 billion mobilisation by developed countries since 2020.
- Even if that amount were available, it would only be a small fraction of the money needed to keep the world on the **1.5°C** pathway until 2030.

- Current assessments suggest annual financial requirements amount to several trillions of dollars.
  - A 2021 report by UN Climate Change estimated that developing countries would need about **USD 6 trillion annually until 2030** to implement their climate action plans. Updated reports are expected to raise this figure substantially.
  - The final agreement at Sharm el-Sheikh outlined that transitioning to a low-carbon economy could require USD 4-6 trillion annually until 2050.
- Tripling renewable energy capacity, as agreed in Dubai, is estimated to cost USD 30 trillion by 2030 as per the **International Renewable Energy Association (IRENA).**
- Combining these estimates suggests an annual requirement of USD 5-7 trillion, equivalent to about **5-7% of global GDP,** highlighting the escalating cost of inaction.

Prospects for a Realistic New Annual Climate Finance Target

- Exact amounts under discussion are undisclosed to the public at present. Given past performance, the expectation that developed nations commit to significantly higher amounts is deemed unrealistic.
- **India has called for the NCQG to be at least USD 1 trillion per year**, primarily in grants and concessional finance.
  - However, it is unlikely that developed countries will commit to an amount close to the assessed requirements, given their failure to mobilise even USD 100 billion annually.
- The UN Climate Change Executive Secretary has urged developed countries to make climate finance **"bigger and better," emphasising the need for "trillions, not billions".**

What are the Challenges Regarding Climate Finance?

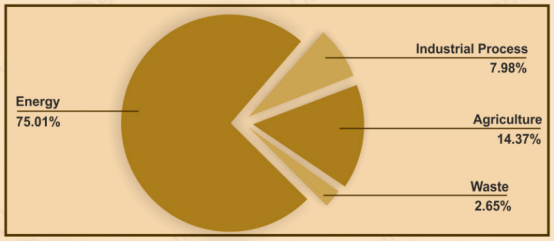
- **Insufficient Funds:**
  - There is a significant gap between the **funds needed to address climate change and the actual resources available** for climate-related projects and initiatives.
  - Many developing countries and vulnerable communities have limited access to climate finance, hindering their ability to implement adaptation and mitigation measures.
  - Many organisations like the **UNFCCC** are currently facing severe financial challenges with a budget that is less than half funded.
- **Lack of Ambition:**
  - Developed countries have been reluctant to commit to the scale of funding necessary to address the climate crisis, particularly in **providing grants and concessional finance to developing nations.**
- **Transparency and Accountability:**
  - There is a need for transparent and inclusive processes to **monitor and measure the delivery of climate finance commitments,** ensuring that funds are distributed equitably and used effectively.
- **Ensuring Equity and Justice:**
  - The distribution and utilisation of climate finance should prioritise equity and justice, taking into account the needs and priorities of the **most vulnerable communities and marginalised groups** who are disproportionately affected by climate change.
- **Mobilising Private Finance:**
  - While public finance from developed nations is crucial, mobilising private sector investment and leveraging innovative financial instruments remain challenges in scaling up climate finance.
- **Capacity Building and Technology Transfer:**
  - Climate finance **should not only focus on monetary support** but also on **capacity building and technology transfer** to enable developing countries to effectively implement climate action and transition to low-carbon economies.
- **Debt Burdens:**
  - The climate finance requirements **add to the existing debt burdens of many developing nations,** raising concerns about their ability to access and repay loans for climate action.
- **Economic Impacts:**
  - The **global economic slowdown and competing priorities** may make it challenging for developed nations to allocate significant resources towards climate finance.

Note:

INDIA'S CLIMATE PROFILE

Sector-wise Contribution

- **Key Emitting Sectors:** Energy, Transportation, Construction



- **Key Climate Risks:** Floods, Droughts, Heat Waves, Cold Waves and Cyclones
- **Vulnerable Sectors:** Agriculture & Food, Water, Coastal, Health, Forests & other natural ecosystems

Key Initiatives for Tackling Climate Change

- **National Policy Framework**
  - National Action Plan on Climate Change (NAPCC)
  - State Action Plan on Climate Change (SAPCC)
- **India's Updated Nationally Determined Contributions (2022)**
  - Mass movement for 'LIFE'– Lifestyle for Environment
  - Adopt a climate-friendly and cleaner path for economic development
  - 45% reduction in emissions intensity of GDP by 2030 compared to 2005 levels, aiming for net-zero emissions by 2070
  - 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030
  - Additional carbon sink of 2.5 to 3 billion tonnes of CO_2
  - Better adapt to climate change by enhancing investments in specific sector
  - Mobilise domestic and new & additional funds
  - Build capacities, create domestic framework and international architecture
- **International Climate Negotiations - UNFCCC (1994) Convention and Agreements**
  - Paris Agreement (2015)
  - Kyoto Protocol (2005)

Bilateral and Multilateral Cooperation

Bilateral Projects

- **With Deutsche Gesellschaftfür Internationale Zusammenarbeit (GIZ) GmbH (Germany)**
  - Climate Adaptation & Finance in Rural India (CAFRI) (2020-2023)
  - Nationally Appropriate Mitigation Actions (NAMAs) (2007)
  - Global Carbon Market (GCM) (1997)
  - Institutionalisation of Capacities on Climate Change Studies and Action (ICCC)
- **With European Union (EU)**
  - Strategic Partnerships for the Implementation of the Paris Agreement (SPIPA) (2018-2022)
  - Clean Technologies and Energy Efficiency for Eco-Cities

Multilateral Projects

- **UN Secretary-General (UNSG) Climate Action Summit (2019)**
- **Global Commission on Adaptation (GCA) (2018)**
- **UNDP:** Market Transformation and Removal of Barriers for Effective Implementation of the State-Level Climate Change Action

Drishti IAS

Sundarbans

Why in News?

The Sundarbans face numerous environmental challenges including freshwater scarcity, pollution from microplastics and chemicals, and coastal erosion, making it important to look for sustainable solutions to protect it.

What is Sundarbans?

- **About:**
  - The Sundarbans hosts the largest mangrove forests in the world, lying on the delta of the Ganges, Brahmaputra and Meghna rivers on the Bay of Bengal.
    - The mangrove ecosystem is a specialised environment between the land and the sea in the tropical and subtropical regions.

Note:

- **Flora Fauna:**
  - It provides shelter for **84 species of flora, including 26 mangrove species, 453 species of fauna,** 120 species of fish, 290 species of birds, 42 species of mammals, 35 reptiles and eight amphibian species. More than 12 million people — 4.5 million in India and 7.5 million in Bangladesh — live in this estuarine ecosystem.
  - Sundarban is the natural **abode of many animal groups and many species** are known to feed, breed and take shelter in this ecosystem.
    - It is home to many rare and globally threatened wildlife species such as the **estuarine crocodile, water monitor lizard, Gangetic dolphin and olive ridley turtle.**
- **Protection:**
  - 40% of Sundarban lies in India and the rest in Bangladesh. Sundarban was designated a **UNESCO World Heritage site in 1987 (India)** and 1997 (Bangladesh).
  - Sundarban Wetland, India was recognised as the 'Wetland of International Importance' under the **Ramsar Convention in January 2019.**
  - **Project TIger:** Project Tiger is one of the most important steps in conserving the Sundarbans unique ecosystem because it protected the entire forest by preserving the Royal Bengal Tiger population.
  - **MOU between India and Bangladesh on Conservation of the Sundarban:** In 2011 Both India and Bangladesh signed an MoU on Conservation of the Sundarbans, recognising the need to monitor and conserve the Sundarbans.
  - **Biosphere Reserve:**
    - Sundarbans is also a **Biosphere Reserve (BR)**, Within which there are several protected areas, including national parks and wildlife sanctuaries, they are,
      - **Sundarbans National Park (India)**
      - **Sundarbans East Wildlife Sanctuary (India)**
      - Sundarbans South Wildlife Sanctuary (India)
      - Sundarbans West Wildlife Sanctuary (India)
      - Sundarbans Reserve Forest (Bangladesh)

Spanning across India and Bangladesh, Sundarbans is amongst the world's largest contiguous blocks of mangrove forest. Less than 40 percent of Sundarbans is located in India and the rest is in Bangladesh. On the Indian side, forest boundaries have changed very little since 1943.

Note:

What are the Challenges Faced by the Sundarbans?

- **Freshwater Scarcity:**
  - The Sundarbans experience scarcity of freshwater due to the predominantly **saline nature of the rivers,** impacting both the ecosystem and the livelihoods of inhabitants.
    - According to the observations of the experts, fresh groundwater may be found deeper than **250 metres and, in some cases,** the groundwater is saline in nature in Sundarbans.
- **Pollution and Erosion:**
  - Pollution from various sources, including microplastics, chemicals from industrial activities, and waste disposal, threatens the delicate ecosystem of the **Sundarbans and the health of its inhabitants.**
    - In some of the study reports, it was found **four million tonnes of microplastics are released** into the Bay of Bengal and the Sundarbans each year from various rivers in Bangladesh and India.
  - **Very little fresh (sweet) water enters the Sundarbans mangrove** system. Some of the major impacting factors are river erosion and exploitation of forest resources.
    - Moreover, the use of **non-forest land for mangrove forestation** further exacerbates the situation.
- **Sea Level Rise:**
  - Sundarbans face nearly double the sea level rise compared to other coastal regions.
  - Also, the increasing frequency and intensity of cyclones in this region pose a serious threat to its carbon sequestration potential and other ecosystem services of this mangrove forest.
  - Rising temperatures, sea levels, and changes in biodiversity due to climate change are putting additional stress on the Sundarbans ecosystem and its inhabitants.
- **Human-Wildlife Conflict:**
  - Conflicts between humans and animals, particularly with species like tigers, pose a **significant challenge to both conservation efforts** and the safety of local communities.
- **Contamination:**
  - Chemicals such as **hydrocarbons and marine paints**, caused by Bangladesh's Mongla Port and India's Leather Estate, **contaminate the rivers and water ecosystem.**

What can be Done to Protect the Sundarbans?

- **Protecting Streambanks:**
  - Instead of introducing non-local s**pecies like vetiver,** cultivating native grass species such as **wild rice** *(Porteresia coarctata)***, *Myriostachya wightiana,*** biscuit grass *(Paspalum vaginatum),* and salt couch grass *(Sporobolus virginicus)* can help stabilise **streambanks and prevent erosion.**
    - Vetivers are not local species and are **not salt–tolerant**.
- **Promoting Sustainable Agriculture:**
  - Encouraging the cultivation of soil-tolerant paddy varieties such as **Darsal, Nona Bokra, Talmugur,** etc and crop cultivation and promoting organic agriculture practices can enhance agricultural productivity **while minimising environmental impact.**
  - Additionally, **promoting organic agriculture can** help farmers increase their income while maintaining environmental health.
    - Implementing rainwater harvesting and watershed development initiatives will further enhance agricultural production.
- **Utilising Non-Timber Forest Resources:**
  - Leveraging non-timber forest resources for economic growth can promote sustainable development while **ensuring the conservation of natural resources.**
    - Mangroves can be climate protectors and sources of livelihood. There are many mangroves such as **Bayen, Garjan, Golpata, Hogla, Hetal, Kankra, Kumbhi , Kayora, Nona Jhau**, Posur, Goran, Gewoya, Sundari, etc. in this area.
    - These mangroves have **economical as well as medicinal values**. Such fruits of Hetal, Kayora and Golpata can be sold in commercial markets.
      - Flowers of Hogla can be used in the food industry to prepare **delicious cuisine and ropes can be prepared from dry leaves.**

Note:

- **Wastewater Treatment:**
  - Utilising natural processes and microorganisms for wastewater treatment, including **lactic acid bacteria and photosynthetic bacteria**, can help **maintain water quality and ecosystem health.**
- **Biodiversity Conservation:**
  - Promoting the conservation of biodiversity, including indigenous fish species like **major carp**, can aid in restoring and maintaining the health of the Sundarbans' ecosystems.
- **India-Bangladesh Collaboration:**
  - The **India-Bangladesh Joint Working Group (JWG)** can be converted into a joint high-powered board and a set of interdisciplinary experts to plan and implement climate resilience of the Sundarbans and the welfare of the communities dependent on this ecosystem.
  - Institutional mechanisms should be blended with the flexibility to work across multiple sectors, engaging locals for tackling the on ground issues effectively.
    - The two nations can learn from several international initiatives such as the **Amazon Cooperation Treaty Organisation** and the **Senegal River Basin Development Organisation.**

Environmental Protection Charge

Why in News?

According to a **CPCB (Central Pollution Control Board)** report submitted to the **National Green Tribunal**, a significant portion of the **Environment Protection Charge (EPC)** and Environmental Compensation (EC) collected by the CPCB remains unspent.

- As much as 80% of the EPC and EC collected by the Central Pollution Control Board remains unspent.

What is the Environment Protection Charge?

- The EPC is a fund used by the **Central Board of Pollution Control (CPCB)** to provide scientific inputs for improving air quality in **Delhi NCR.** The CPCB works with other institutions like IIT and NEERI under the EPC fund.
- The EPC is received as per an order of the **Supreme Court (*M.C. Mehta Vs Union of India Case, 1985*), and for air quality improvement** and related work in Delhi-NCR such as research and development activities and vehicular pollution control health impact studies and specific projects to control pollution in Delhi-NCR and Punjab.
- The CPCB also receives 25% of the environmental compensation collected by state pollution control boards. It also collects environmental penalties directly from polluters/defaulters in various matters.
  - In 2016, the **SC (Supreme Court)** imposed an **EPC of 1% on the sale of 2000cc** and above diesel cars in Delhi and NCR.

What is Environmental Compensation?

- The EC is a tool **aimed at protecting the environment and mitigating the damage** caused by pollution. It operates on the **principle of "polluter pays,"** which means that those who are responsible for polluting the environment should bear the cost of its restoration or compensation for the damage caused.
- In simple terms, environmental compensation involves **imposing monetary penalties on individuals, companies**, or entities that pollute the environment or adversely affect human health.
- These penalties are intended to recover the costs associated with the environmental damage and to deter future violations.

What is CPCB?

- The **Central Pollution Control Board (CPCB),** is a statutory organisation, was constituted in 1974 under the **Water (Prevention and Control of Pollution) Act, 1974.**
- CPCB was also entrusted with the powers and functions under the **Air (Prevention and Control of Pollution) Act, 1981.**
- It serves as a field formation and also provides technical services to the Ministry of Environment and Forests and Climate change of the provisions of the **Environment (Protection) Act, 1986.**

Note:

What is the National Green Tribunal?

- **Foundation:** The NGT was established in October, 2010, under the National Green Tribunal Act 2010.
  - Its primary focus is to facilitate the swift and efficient resolution of cases related to environmental protection, conservation of forests, and preservation of natural resources.
  - Currently, **New Delhi serves as the principal place of sitting of NGT**, with Bhopal, Pune, Kolkata, and Chennai designated as the other four places of sitting for the Tribunal.
- **Structure:**
  - The Tribunal is headed by the Chairperson who sits in the Principal Bench and has at least 10 but not more than 20 judicial members and expert members.
    - The Chairperson is appointed by the Central Government in consultation **with the** Chief Justice of India (CJI).
    - A Selection Committee shall be formed by the central government to appoint the Judicial Members and Expert Members.
- **Legal Mandate:** The Tribunal's jurisdiction extends to **enforcing environmental rights, granting relief and compensation** for damages to individuals and property, and addressing matters associated with environmental protection and conservation.
  - It operates independently of the **procedural rules laid down in the** Code of Civil Procedure**, 1908, guided instead by principles of natural justice.**
  - Any person seeking relief and compensation for environmental damage involving subjects in the legislations mentioned in **Schedule I of the National Green Tribunal Act, 2010,** may approach the Tribunal. The statutes in **Schedule I are:**
    - The Water (Prevention and Control of Pollution) Act, 1974
    - **The Water (Prevention and Control of Pollution) Cess Act, 1977**
    - The Forest (Conservation) Act, 1980
    - The Air (Prevention and Control of Pollution) Act, 1981
    - The Environment (Protection) Act, 1986
    - The Public Liability Insurance Act, 1991
    - The Biological Diversity Act, 2002.

Great Indian Bustards

Why in News?

Recently, the Supreme Court (SC) has constituted an **expert committee to balance the conservation** and protection of the endangered Great Indian Bustard **bird** population with the country's international commitments to promote Renewable sources of energy.

- The large-winged birds are on the brink of extinction, with one of the causes being frequent collisions with **high-powered power cables running adjacent** to its core habitats in Gujarat and Rajasthan.

What is the Great Indian Bustard?

- **About:**
  - The **Great Indian Bustard (*Ardeotis nigriceps*)**, the **State bird of Rajasthan**, is considered India's most **critically endangered bird.**
  - It is considered the flagship grassland species, representing the health of the grassland ecology.
  - Its population is confined mostly to Rajasthan and Gujarat. Small populations occur in **Maharashtra, Karnataka and Andhra Pradesh.**
- **Vulnerability:**
  - The bird is under constant threats due to collision/ electrocution with power transmission lines, hunting (still prevalent in Pakistan), habitat loss and alteration as a result of widespread agricultural expansion, etc.
  - GIBs are a **slow-reproducing species**. They lay a few eggs and have almost a **year-long parental care of chicks**. The GIB achieves maturity in around 3-4 years.
- **Protection Status:**
  - IUCN Red List: **Critically Endangered**
  - Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): **Appendix 1**
  - Convention on Migratory Species (CMS): **Appendix I**
  - Wildlife (Protection) Act, 1972: **Schedule I**

Note:

What Steps are Being Taken to Conserve the GIB?

- **Species Recovery Programme:**
  - It is kept under the species recovery programme under the **Integrated Development of Wildlife Habitats** of the Ministry of Environment, Forests and Climate Change (MoEFCC).
- **Firefly Bird Diverters:**
  - **Firefly bird diverters** are flaps installed on power lines. They work as **reflectors for bird species like the GIB.**
  - Birds can spot them from a distance of about 50 meters and change their path of flight to avoid collision with power lines.
- **Artificial Hatching:**
  - The conservation breeding programme started in 2019 by collecting eggs from the wild and **artificially hatching them.** The first chick hatched on 21st June 2019, and was **named 'Uno'**. Eight more chicks were hatched that year and raised and monitored.
  - A total of **29 GIBs have been housed** in the two breeding centres in Rajasthan.
- **National Bustard Recovery Plans:**
  - It is currently being implemented by conservation agencies.
- **Conservation Breeding Facility:**
  - MoEF&CC, the Rajasthan government and the **Wildlife Institute of India (WII)** have also established a conservation breeding facility in **Desert National Park** at **Jaisalmer in June 2019.**
- **Project Great Indian Bustard:**
  - It has been **launched by the Rajasthan government** to construct breeding enclosures for the species and develop infrastructure to reduce human pressure on its habitats.

Desert National Park

- It is situated on the western border of India **within the Jaisalmer & Barmer Districts of Rajasthan.**
- Great Indian Bustards, Rajasthan State animal (Chinkara), State tree (khejri) and State flower (Rohida) are found naturally at this park.
- It was declared a **UNESCO World Heritage Site in 1980** and National Park in 1992.

Kutch Bustard Sanctuary

- The Kutch Bustard Sanctuary is **located near Nalia in the Kutch district of Gujarat,** India.
- It is the smallest sanctuary in the country, spread over just two square kilometres. The sanctuary, also known as the **Lala-Parijan sanctuary,** was declared in July 1992 primarily to **safeguard the endangered Great Indian bustard.**
- The sanctuary is home to three **species of Bustards:** the Great Indian bustard, lesser floricans, and the Macqueen bustard.

Captive Elephant (Transfer or Transport) Rules, 2024

Why in News?

The Ministry of Environment, Forest, and Climate Change (MoEF&CC) has notified the **Captive Elephant (Transfer or Transport) Rules, 2024,** which liberalises the conditions for transferring **elephants** within or between states.

What are the Captive Elephant (Transfer or Transport) Rules, 2024?

- **Circumstances for Transfer of Captive Elephants:** Transfer may occur when:
  - The **owner is no longer capable** of adequately maintaining the elephant's welfare.
  - If it's determined that the **elephant will receive better care in the new circumstances** compared to its current situation.
  - The **Chief Wildlife Warden may deem it necessary** for the elephant's better upkeep based on the specific circumstances of the case.
- **Procedure Within the State:**
  - Before a transfer within a state, the **elephant's health must be confirmed** by a veterinarian.
  - The suitability of both the current and prospective habitats must be verified by the **Deputy Conservator of Forests.**
  - Approval or rejection of the transfer is at the discretion of the **Chief Wildlife Warden** based on these assessments.
- **Procedure Outside the State:**
  - Similar conditions apply for transferring elephants outside a state.

Note:

- Additionally, the **elephant's genetic profile must be registered** with the MoEF&CC before the transfer.

➢ **Requirements for Elephant Transfer:**

- The elephant must be accompanied by a **mahout and an elephant assistant.**
- A health certificate from a veterinary practitioner confirming fitness for transport is mandatory.
- Transport should occur after the quarantine period, if required for contagious diseases, is completed.
- Proper feeding and watering arrangements must be made during transport.
- Tranquillisers/sedatives shall be used to control nervous or temperamental elephants upon prescription by the veterinary practitioner.

Note:

➢ Until August 2022, the Wildlife Protection Act 1972 explicitly **prohibited the trade in wildlife including both wild and captive elephants.**

➢ The Captive Elephant (Transfer or Transport) Rules, 2024 stem from **amendments to the Wildlife Protection Act in 2022** exempting captive elephants from the prohibition on wildlife trade.

- A Parliamentary Committee, recommended the deletion of this exemption clause for elephants and providing **only an exemption for elephants owned by temple trusts** and argued that a "careful balance" between traditions and conservation was needed.
- Despite recommendations to delete this exemption, the final amended act retains it, **allowing transfers only for elephants with an existing certificate of ownership.**

Global Methane Tracker 2024

Why in News?

The **International Energy Agency**'s **Global Methane Tracker 2024** indicates that **methane** emissions from fuel usage in 2023 were nearly at their **highest level** on record, representing a slight increase compared to 2022.

What are the Major Highlights of Global Methane Tracker 2024?

➢ **Methane Emissions Overview:** In 2023, methane emissions from fossil fuels totaled close to **120 million tonnes (Mt)**.

- **Bioenergy** (largely from biomass use) contributed a further 10 Mt methane emissions. This level has stayed constant since 2019.

➢ **Rise of Major Methane Emissions Events:** Major methane emissions events increased by over 50% in 2023 compared to 2022.

- These events included more than 5 million metric tons of methane emissions from significant fossil fuel leaks globally.
- One prominent incident was a major **well blowout in Kazakhstan** that lasted **over 200 days.**

➢ **Top Emitting Countries:** Nearly **70% of methane emissions from fossil fuels come from the top 10 emitting countries.**

- The **United States** is the largest emitter of methane from oil and gas operations, closely followed by **Russia**.
- **China** is the highest emitter of methane in the coal sector.

➢ **Importance of Cutting Methane Emissions:** Cutting methane emissions from fossil fuels by **75% by 2030 is crucial for limiting global warming to 1.5 °C.**

- The IEA estimated that this goal would require about **USD 170 billion in spending**. This is less than 5% of the income generated by the fossil fuel industry in 2023.
- Around 40% of emissions from fossil fuels in 2023 could have been avoided at no net cost.

What is Methane?

➢ **About:** Methane is the simplest hydrocarbon, consisting of one carbon atom and four hydrogen atoms (CH4).

- It is the primary component of natural gas, possessing key characteristics:
  - **Odourless, colourless, and tasteless gas.**
  - Lighter than air.
  - Burns with a **blue flame in complete combustion**, yielding carbon dioxide (CO_2) and water (H_2O) in the presence of oxygen.

➢ **Contribution to Global Warming:** Methane ranks as the **second** most important **greenhouse gas (GHG)** after carbon dioxide (CO_2).

- Its 20-year global warming potential (GWP) is **84**, indicating that it traps 84 times more heat per mass unit than CO_2 over a 20-year period, making it a potent GHG.

Note:

- Despite its potency, methane has a shorter atmospheric lifetime compared to CO_2, **classifying it as a short-lived GHG.**

❍ It is a significant contributor to global warming, accounting for about **30% of the rise in global temperatures since the preindustrial era.**

❍ Methane also contributes to the formation of ground-level ozone.

➢ **Major Sources of Methane Emission:**

❍ **Natural Sources:**

- **Wetlands**, both natural and human-made, are significant sources of methane emissions due to anaerobic decomposition of organic matter.

❍ **Agricultural Activities:**

- Growing **paddy** fields release methane due to **anaerobic conditions in flooded rice paddies.**
- **Excreta from cattle** and other livestock undergo enteric fermentation, producing methane as a byproduct.

❍ **Combustion and Industrial Processes:**

- Burning of **fossil fuels,** including oil and natural gas, releases methane emissions.
- **Biomass burning,** such as wood and agricultural residues, also contributes to methane levels.
- Industrial activities like **landfills and wastewater treatment plants** generate methane during organic waste decomposition in anaerobic environments.
- **Fertiliser factories** and other industrial processes can also release methane during production and transportation.

➢ **Initiatives to Tackle Methane Emissions:**

❍ **India:**

- **Harit Dhara (HD)**
- **BS VI Emission Norms.**
- **National Action Plan on Climate Change (NAPCC)**

❍ **Global:**

- **Methane Alert and Response System (MARS).**
- **Global Methane Pledge**
- **Global Methane Initiative (GMI)**
- **MethaneSAT**

What is the Global Methane Pledge?

➢ **About:** The Global Methane Pledge was launched at **UNFCCC COP26 in November 2021** to catalyse action to reduce methane emissions. Led by the US and the EU, the Pledge now has 111 country participants who together are responsible for **45% of global human-caused methane emissions.**

❍ It aims for a 30% reduction in global methane emissions from 2020 levels by 2030.

❍ India has **opted not to sign** the Global Methane Pledge.

➢ **Key Reasons for this Decision Include:**

❍ India contends that the primary contributor to climate change remains CO_2, with a long lifespan of **100-1000 years.**

- The Pledge shifts focus to methane reduction, which has a shorter lifespan of just **12 years**, thus altering the burden of CO_2 reduction.

❍ Methane emissions in India primarily stem from **agricultural activities like enteric fermentation and paddy cultivation,** affecting small, marginal, and medium farmers whose livelihoods would be jeopardised by the Pledge.

- This contrasts with industrial agriculture prevalent in developed countries.
- Also, given India's significant role as a rice producer and exporter, signing the Pledge could affect trade and economic prospects.

❍ India hosts the **world's largest cattle population**, supporting the livelihoods of many.

- However, Indian livestock's contribution to global enteric methane is minimal due to their diet rich in agricultural by-products and unconventional feed materials.

What is the International Energy Agency?

➢ IEA is an independent intergovernmental organisation founded in **1974** in **Paris, France.**

➢ Its primary emphasis isblications are the **World Energy Outlook Report, World Energy Investment Report, and India Energy Outlook Report.**

❍ India became a member of the IEA in 2017.

World Sparrow Day 2024

Why in News?

Every year, **World Sparrow Day is observed on March 20,** shedding light on the significance of sparrows in maintaining biodiversity and ecological balance.

Note:

What are the Key Highlights of the World Sparrow Day 2024?

- **Theme:** In 2024, the theme for World Sparrow Day is **"Sparrows: Give them a tweet-chance!", "I Love Sparrows"** and **"We Love Sparrows".**
- **History:** The inaugural World Sparrow Day took place on March 20, 2010. In India, it was initiated by the **Nature Forever Society.**
  - Founded by Mohammed Dilawar, an Indian conservationist, the society aimed to emphasize the importance of conserving **house sparrows** and other common birds.

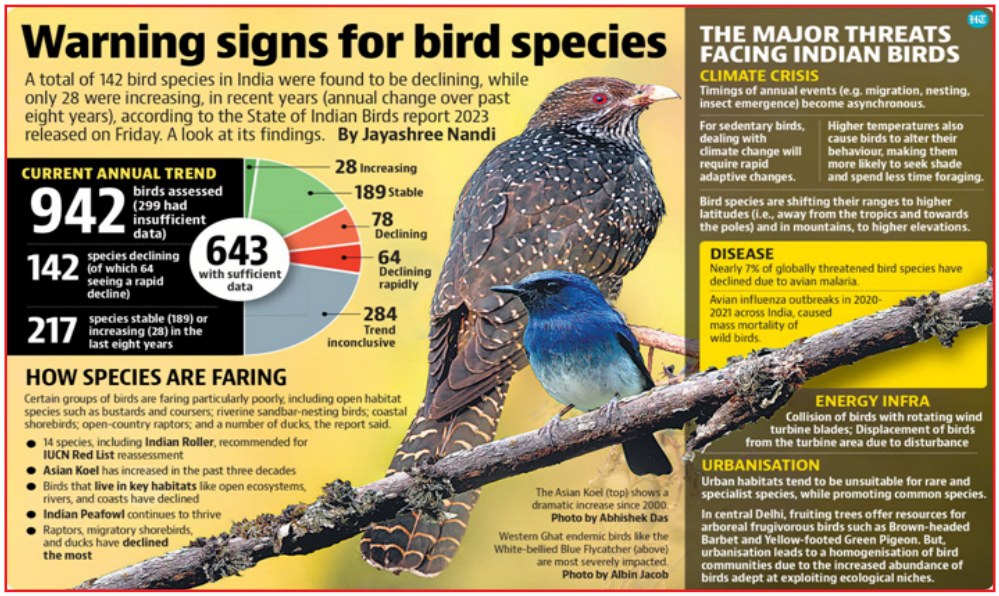
What are the Key Facts About Sparrow?

- Sparrows are crucial for biodiversity and plant growth in ecosystems. They consume and excrete seeds, helping to disperse plant seeds and promote vegetation.
- **Threats:**
  - Sparrow populations are declining due to **habitat degradation, urbanization, and changes in agricultural practices**. The loss of nesting sites and foraging areas, as well as the decline in insect populations, are major factors.
  - This decline has wide-ranging effects, including potential increases in insect pests and threats to biodiversity.
- **Conservation:**
  - Efforts include urban greening projects and agroecological practices to create suitable habitats for sparrows.

Note:

- House Sparrow ***(Passer domesticus)*** belongs to the **order Passeriformes** and the **family Passeridae.**
  - It is the **state bird of Bihar and Delhi** and is commonly found due to its proximity to human habitations.
  - **Its conservation status is Least Concern on the IUCN Red List.**

Note:



Read more: State of India's Birds 2023 Report

State of the Global Climate 2023: WMO

Why in News?

Recently, the **World Meteorological Organization (WMO)** has released its ***State of the Global Climate 2023 report***, which highlights that the heat content of the world's oceans reached a record high in 2023.

- Additionally, **weather and climate hazards have compounded** concerns over **food security, population displacements,** and impacts on vulnerable populations in 2023.

What are the Key Highlights of the Report?

- **Record-High Ocean Heat Content:**
  - The heat content of the **world's oceans reached a record high in 2023**, with the highest level of ocean heat content ever recorded.
  - This increase in ocean heat content is **attributed to anthropogenic climate drivers** such as **greenhouse gas (GHG)** emissions and changes in land use.
- **Contrasting Heating and Cooling Patterns in the North Atlantic:**
  - While the majority of the world's oceans are experiencing warming, relatively small regions, **such as the subpolar North Atlantic Ocean**, are experiencing cooling.
  - This cooling is linked to the slowdown of the **Atlantic Meridional Overturning Circulation (AMOC)**, a system of ocean currents.
    - AMOC is a system of **ocean currents that circulates water within the Atlantic Ocean**, bringing warm water **north and cold water south.**

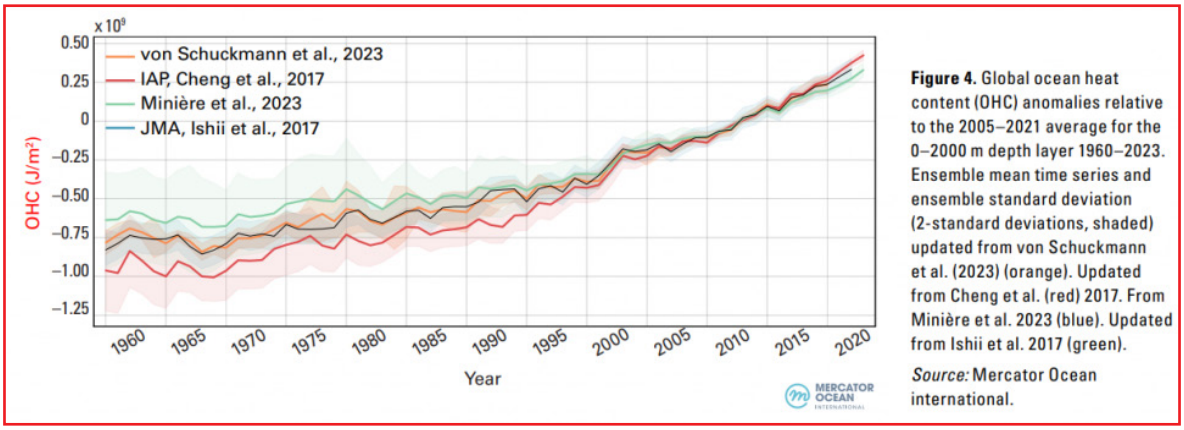


Figure 4. Global ocean heat content (OHC) anomalies relative to the 2005–2021 average for the 0–2000 m depth layer 1960–2023. Ensemble mean time series and ensemble standard deviation (2-standard deviations, shaded) updated from von Schuckmann et al. (2023) (orange). Updated from Cheng et al. (red) 2017. From Minière et al. 2023 (blue). Updated from Ishii et al. 2017 (green).

Source: Mercator Ocean international.

Note:

- **Global Average Sea-Surface Temperatures:**
  - Global average **sea-surface temperatures (SST)** were at a record high in 2023, with several months breaking previous records by significant margins.
  - Exceptional heating was observed in various regions including the eastern North Atlantic, the **Gulf of Mexico, the Caribbean, the North Pacific, and large areas of the Southern Ocean.**
- **Marine Heatwaves and Ocean Acidification:**
  - The global ocean experienced an average daily **Marine Heatwave** coverage of 32%, well above the previous record of 23% in 2016.
  - At the end of 2023, most of the global ocean **between 20° S and 20° N had been in heatwave conditions** since early November.
    - The end of 2023 saw a broad band of severe and extreme marine heatwave across the North Atlantic, with temperatures 3°C above average.
  - These heat waves have negative repercussions for marine ecosystems and coral reefs. Additionally, **ocean acidification** has increased due to the absorption of carbon dioxide by the oceans.
- **Global Mean Near-Surface Temperature:**
  - The global mean near-surface temperature in 2023 was 1.45 ± 0.12 °C above the **pre-industrial 1850–1900 average**, making it the **warmest year on record.**
  - Every month from **June to December was record warm for the respective month**, and the long-term increase in global temperature is attributed to **increased concentrations of greenhouse gases** in the atmosphere.
- **Accelerating Glacial Retreat and Antarctic Sea Ice Loss:**
  - Glaciers worldwide experienced the largest loss of ice on record, driven by extreme melt in both western North America and Europe.
  - Antarctic sea ice extent reached an absolute record low for the satellite era, and Arctic sea ice extent remained well below normal.
- **Increased Frequency and Intensity of Extreme Weather Events:**
  - Extreme weather events such as heatwaves, floods, droughts, wildfires, and tropical cyclones had major socio-economic impacts on all inhabited continents.
    - Flooding linked to extreme rainfall from **Mediterranean Cyclone Daniel affected Greece**, Bulgaria, Türkiye, and Libya with particularly heavy loss of life in Libya in September 2023.
    - Tropical **Cyclone Freddy in February and March** 2023 was one of the world's longest-lived tropical cyclones with major impacts on Madagascar, Mozambique and Malawi.
    - Tropical **Cyclone Mocha** in 2023, was one of the most intense cyclones ever observed in the Bay of Bengal and triggered 1.7 million displacements across the sub-region from Sri Lanka to Myanmar and through India and Bangladesh, and worsened acute food insecurity.
- **Renewable Energy Surge:**
  - Renewable energy generation surged in 2023, with renewable capacity additions increasing by almost 50% from the previous year.
  - This growth indicates the potential for achieving decarbonisation targets and transitioning to clean energy sources to mitigate climate change.
- **Climate Financing Challenges:**
  - In 2021/2022, global **climate-related finance flows** reached almost USD 1.3 trillion, nearly doubling compared to **2019/2020 levels**. Even so, tracked climate finance flows represent only **approximately 1% of global GDP.**
  - There is a large financing gap. In an average scenario, for a 1.5°C pathway, annual climate finance investments **need to grow by more than six times, reaching almost USD 9 trillion by 2030** and a further USD 10 trillion through 2050.
  - Adaptation finance continues to be insufficient. Though adaptation finance reached an all-time high of USD 63 bn in 2021-22, the global adaptation financing gap is widening, falling well short of the **estimated USD 212 bn per year needed up to 2030 in developing countries alone.**

Note:

What were the Socioeconomic Impacts of Weather and Climate Hazards?

- **Food Insecurity:**
  - Extreme weather events such as **floods**, **droughts**, and storms led to crop and **livestock production losses**, exacerbating **food insecurity globally.**
  - The acute food insecurity more than doubled from 149 million people affected before the **Covid-19 pandemic to 333 million in 2023.**
    - This crisis is the largest in modern human history, indicating the profound impact of **climate-related events on food availability and access.**
- **Population Displacement:**
  - Displacements occurred in regions like **Syria, Lebanon, Jordan, Iraq, Egypt, Somalia, and Pakistan** where communities were already vulnerable due to conflict or previous **climate-related events**.
  - These displacements strain resources and **exacerbate social tensions, contributing to instability in affected regions**.
    - Displaced populations living in temporary shelters are particularly vulnerable to disease outbreaks, which can further strain healthcare systems already grappling with the impacts of climate-related disasters.
- **Economic Losses:**
  - These losses include damage to infrastructure, agricultural productivity, and livelihoods.
  - The destruction of agricultural areas due to flooding and storms, as well as the disruption of supply chains, hinders economic recovery and exacerbates poverty in affected regions.
- **Inequality:**
  - Migration and displacement due to climate-related shocks and stresses affect people's livelihoods which affect various **Sustainable Development Goals (SDG)**.
    - These include poverty (SDG 1) and hunger (SDG 2), direct threats to their lives and well-being (SDG 3), widening inequality gaps (SDG 10), limited access to quality education (SDG 4), water and sanitation (SDG 6) as well as clean energy (SDG 7).
    - Pre-existing gender and socio-economic **inequalities mean women and girls are among the worst affected, impacting SDG5.**
- **Global Economic Impact:**
  - The socioeconomic impacts of climate-related disasters extend beyond individual countries and regions, affecting global economic stability.
  - Rising food prices, disruptions to supply chains, and increased humanitarian aid expenditures strain r**esources and contribute to economic uncertainty** on a global scale.

What is the World Meteorological Organization (WMO)?

- The **World Meteorological Organization (WMO)** is an intergovernmental organisation with a membership of 192 Member States and Territories.
  - India is a member of WMO.
- It originated from the **International Meteorological Organization (IMO)**, which was established after the **1873 Vienna International Meteorological Congress.**
- Established by the ratification of the WMO Convention on 23rd March 1950, WMO became the specialised agency of the UN for meteorology (weather and climate), operational hydrology and related geophysical sciences.
- WMO is **headquartered in Geneva**, Switzerland.

World Air Quality Report 2023

Why in News?

India has been identified as the **world's third most polluted country,** as per the **World Air Quality Report 2023** by Swiss organisation IQAir.

What are the Key Highlights of the World Air Quality Report 2023?

- **India's Air Quality Ranking:**

Note:

- Ranked as the **world's third most polluted country**, with an average annual **PM2.5 concentration** of **54.4 micrograms per cubic meter.**
  - **Bangladesh and Pakistan** surpassed India in pollution levels, becoming the most and second most polluted countries, respectively.
  - **9 out of the top 10 most polluted cities in the world are from India.**
- India's air quality deteriorated compared to the previous year, with Delhi emerging as the world's most polluted capital city for the fourth consecutive time.
- **Begusarai in Bihar is labelled as the world's most polluted metropolitan area**, with an average PM2.5 concentration of 118.9 micrograms per cubic meter.
- **Health Impacts and WHO Guidelines:**
  - Around **136 million Indians (96% of the Indian population**) face PM2.5 concentrations (seven times) higher than the World Health Organization's recommended levels of **5 micrograms per cubic meter.**
    - Over 66% of Indian cities have reported **annual averages higher than 35 micrograms per cubic metre (µg/m3).**
  - PM2.5 pollution, primarily from burning fossil fuels, is linked to increased rates of heart attack, stroke, and oxidative stress, with severe health implications.

➢ **Global Air Quality:**

- Seven countries that met the WHO annual PM2.5 guideline (annual average of 5 µg/m3 or less) included **Australia, Estonia, Finland, Grenada, Iceland, Mauritius, and New Zealand.**
- The report states that **Africa continues to be the most underrepresented continent,** with a third of its population lacking access to air quality data.
- Some countries, including **China and Chile,** reported decreases in PM2.5 pollution levels, indicating progress in combating air pollution.
- Pollution does not stay confined to its source, with prevailing winds distributing it across regions, emphasising the need for international cooperation in addressing air quality issues.
- **Global Impact of Air Pollution:**
  - Air pollution causes approximately **seven million premature deaths worldwide annually.** It contributes to approximately **one in every nine deaths worldwide.**
  - PM2.5 exposure leads to health issues like **asthma, cancer, stroke, and mental health complications.**
  - Exposure to elevated levels of fine particles can **impair cognitive development in children,** lead to mental health issues, and complicate existing illnesses, including diabetes.

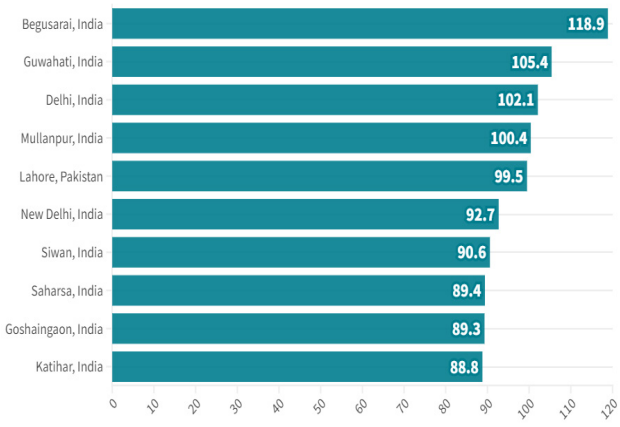
World's most polluted countries

Most polluted country ranking based on annual average PM2.5 concentration (µg/m³)

Rank	Country	2023	2022	2021	2020	2019
1	Bangladesh	79.9	65.8	76.9	77.1	83.3
2	Pakistan	73.7	70.9	66.8	59	65.8
3	India	54.4	53.3	58.1	51.9	58.1
4	Tajikistan	49	46	59.4	30.9	--
5	Burkina Faso	46.6	63	--	--	--
6	Iraq	43.8	80.1	49.7	--	39.6
7	United Arab Emirates	43	45.9	36	29.2	38.9
8	Nepal	42.4	40.1	46	39.2	44.5
9	Egypt	42.4	46.5	29.1	--	18
10	Democratic Republic of the Congo	40.8	15.5	--	--	32.1

World's most polluted cities

Most polluted city ranking based on annual average PM2.5 concentration (µg/m³)



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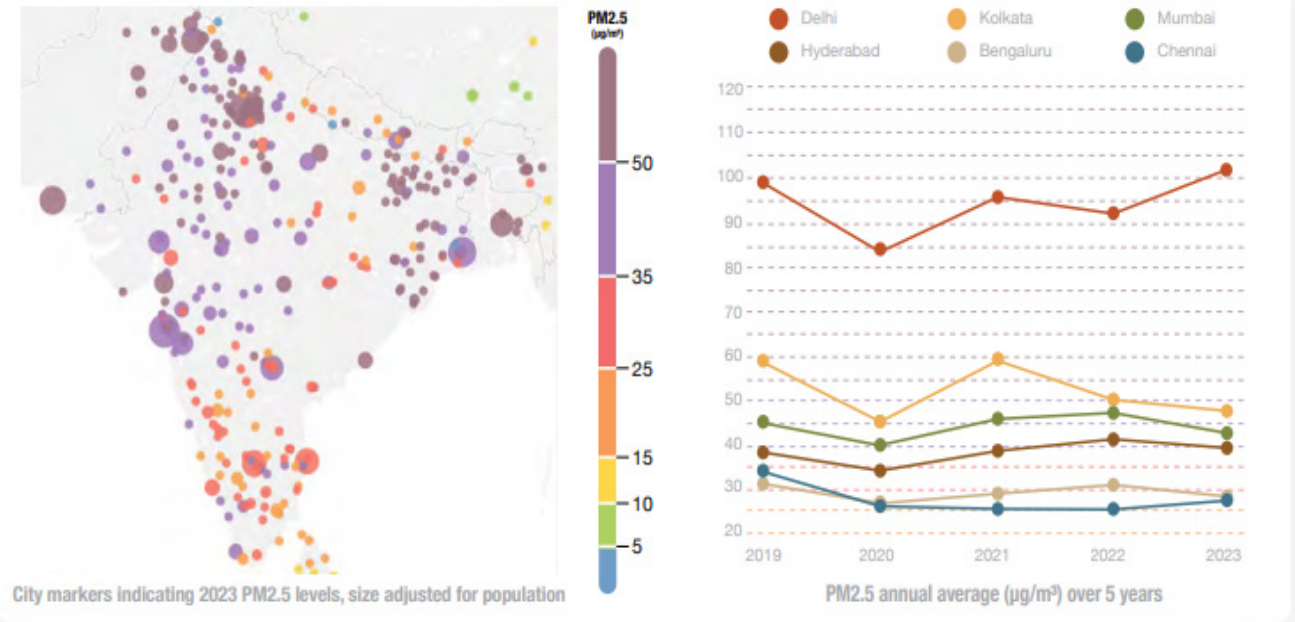
What are the WHO Air Quality Guidelines?

- **Pollutants Covered:**
  - The World Health Organization (WHO) regularly updates its evidence-based air quality guidelines to safeguard public health from the ongoing threat of air pollution. The most **recent update occurred in 2021**, revising the guidelines that were originally published in 2005.
  - The guidelines cover both **particulate matter (PM)** and gaseous pollutants, including PM2.5, PM10, ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and carbon monoxide (CO).

Recommended 2021 AQG levels compared to 2005 air quality guidelines

Pollutant	Averaging Time	2005 AQGs	2021 AQGs
$PM_{2.5}$, µg/m^3	Annual	10	5
	24-hour[a]	25	15
PM_{10}, µg/m^3	Annual	20	15
	24-hour[a]	50	45
O_3, µg/m^3	Peak season[b]	-	60
	8-hour[a]	100	100
NO_2, µg/m^3	Annual	40	10
	24-hour[a]	-	25
SO_2, µg/m^3	24-hour[a]	20	40
CO, mg/m^3	24-hour[a]	-	4



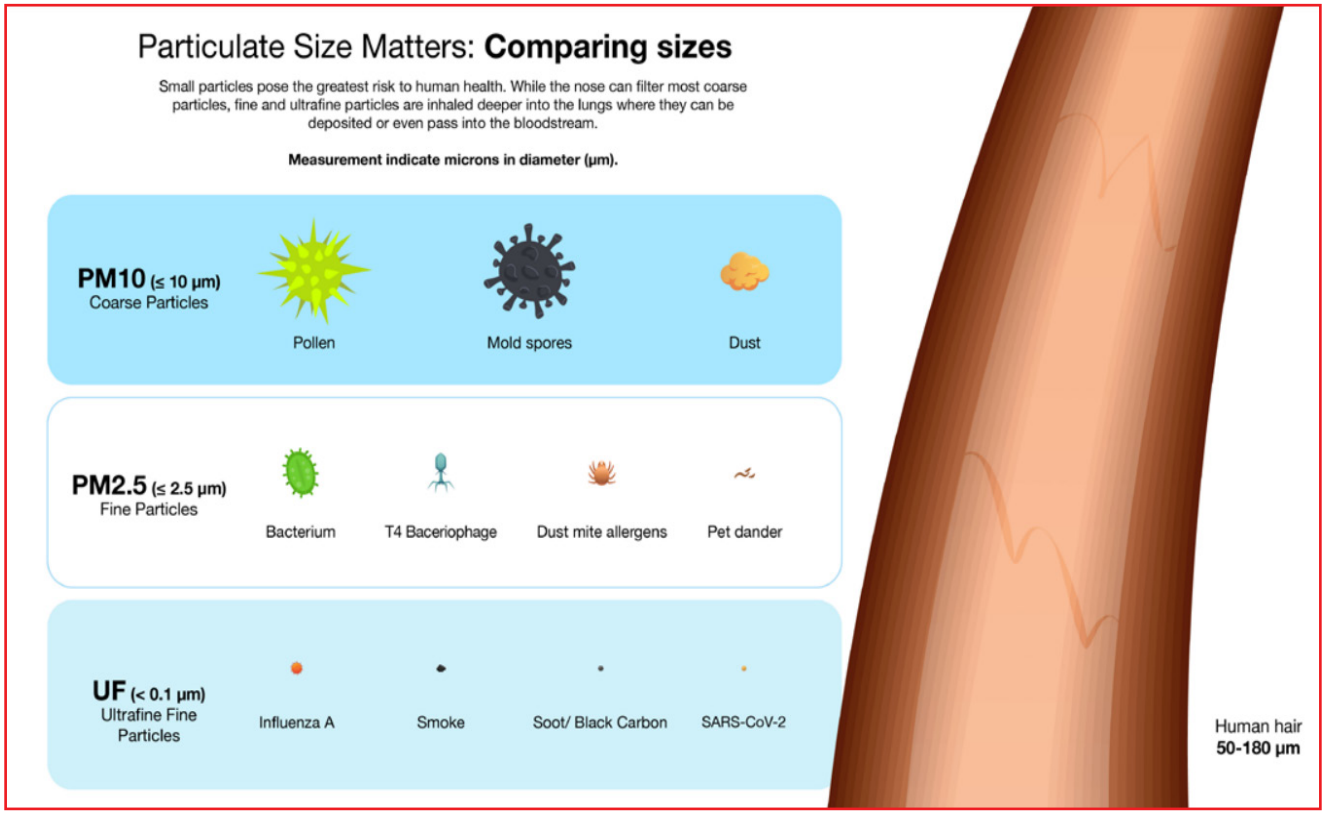
City markers indicating 2023 PM2.5 levels, size adjusted for population

PM2.5 annual average (µg/m³) over 5 years

Note:

Particulate Matter (PM)

- Particulate matter, or PM, refers to a complex mixture of extremely **small particles and liquid droplets** suspended in the air. These particles come in a wide range of sizes and can be made up of hundreds of different compounds.
  - **PM10 (coarse particles)** - Particles with a diameter of 10 micrometres or less.
  - **PM2.5 (fine particles)** - Particles with a diameter of 2.5 micrometres or less.



Air pollution

- It is the contamination of the environment by **chemicals, physical or biological agents.** Sources include household devices, vehicles, industrial facilities, and forest fires.
  - Major pollutants include particulate matter, carbon monoxide, ozone, nitrogen dioxide, and sulfur dioxide, causing respiratory diseases and high mortality rates.
- WHO data shows that **99% of the global population breathes air exceeding guideline limits,** with low- and middle-income countries suffering the most.
- Air quality is closely linked to the earth's climate and ecosystems, and policies to reduce air pollution offer a win-win strategy for both climate and health.
- All of **India's 1.4 billion people (100% of the country's population) are exposed to unhealthy levels of ambient PM2.5.**
  - The health impacts of pollution also represent a heavy cost to the economy. Lost output from premature deaths and morbidity attributable to air pollution accounted for economic losses of USD 36.8 billion was **1.36% of India's gross domestic product (GDP).**

Note:

Air Pollutants

Sulphur Dioxide (SO_2)

It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Ozone (O_3)

Secondary pollutant formed from other pollutants (NOx and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

Nitrogen Dioxide (NO_2)

Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

Impact: Chronic lung disease.

Carbon Monoxide (CO)

It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

Ammonia (NH_3)

Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Lead (Pb)

Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)

PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.
PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.
Source: Emitted from construction sites, unpaved roads, fields, fires.
Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: *These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.*

Note:

What are the Initiatives Taken for Controlling Air Pollution?

- National Clean Air Programme (NCAP).
- Bharat Stage Emission Standards.
- Solid Waste Management Rules,2016.
- System of Air Quality and Weather Forecasting and Research (SAFAR) Portal.
- Air Quality Index.
- Graded Response Action Plan.
- National Air Quality Monitoring Programme (NAMP).
- Commission for Air Quality Management.
- Turbo Happy Seeder (THS) Machine.

Forest Fires

Why in News?

Recently, Forest Fires have been raging in the **Coonoor forest range in the Nilgiris in Tamil Nadu.**

- The Indian Air Force joined the ongoing firefighting efforts of the state forest department, deploying a Mi-17 V5 helicopter to conduct multiple **"Bambi Bucket"** operations.

Note: The Bambi Bucket, also called a helicopter bucket or a helibucket, is a specialised container that is suspended by cable under a chopper, and which can be filled by lowering into a river or pond before being flown a**bove a fire and discharged aerially by opening a valve at the bottom of the bucket.**

- The Bambi Bucket is especially helpful in fighting wildfires that are difficult or impossible to reach from the ground. Around the world, helicopters are frequently commissioned to fight forest fires.

What is a Forest Fire?

- **About:**
  - Also called **bush or vegetation fire or wildfire**, it can be described as any uncontrolled and non-prescribed combustion or burning of plants in a natural setting such as a forest, grassland, brushland or tundra, which consumes the natural fuels and spreads based on environmental conditions (e.g., wind, topography).
  - A wildfire requires **three essential elements to sustain combustion like** Fuel, Oxygen, and a Heat source.
- **Classification:**
  - **Surface Fire:** A forest fire may burn primarily as a surface **fire, spreading along the ground** as the surface litter (senescent leaves and twigs and dry grasses etc) on the forest floor and is engulfed by the spreading flames.
  - **Underground Fire/Zombie Fire:** The fires of low intensity, consuming the organic matter beneath and the surface litter of the forest floor are sub-grouped as underground fires. In most of the dense forests, **a thick mantle of organic matter is found on top of the mineral soil.**
    - These fires usually **spread entirely underground** and burn for some meters below the surface.
    - This fire spreads very slowly and in most cases it becomes **very hard to detect and control** such types of fires.
    - They may continue to **burn for months** and destroy the vegetative cover of the soil.
  - **Canopy or Crown Fires:** These occur when **fire spreads through the upper canopy of trees,** often fueled by high winds and dry conditions. They can be particularly intense and difficult to control.
  - **Controlled Deliberate Fires:** In some cases, controlled deliberate fires, also known as **prescribed burns or bushfires**, are intentionally set by forest management agencies to reduce fuel loads, **mitigate the risk of uncontrolled wildfires,** and promote ecosystem health.
    - These controlled burns are carefully planned and executed under specific conditions to minimize risks and maximize benefits to the forest ecosystem.
- **Government Initiatives:**
- National Action Plan for Forest Fires (NAPFF), was started in 2018 with the goal of reducing forest fires by informing, enabling, and empowering forest fringe communities and incentivizing them to collaborate with state forest departments.
- The Forest Fire Prevention and Management Scheme (FPM) is the only government-sponsored programme dedicated to assisting states in dealing with forest fires.

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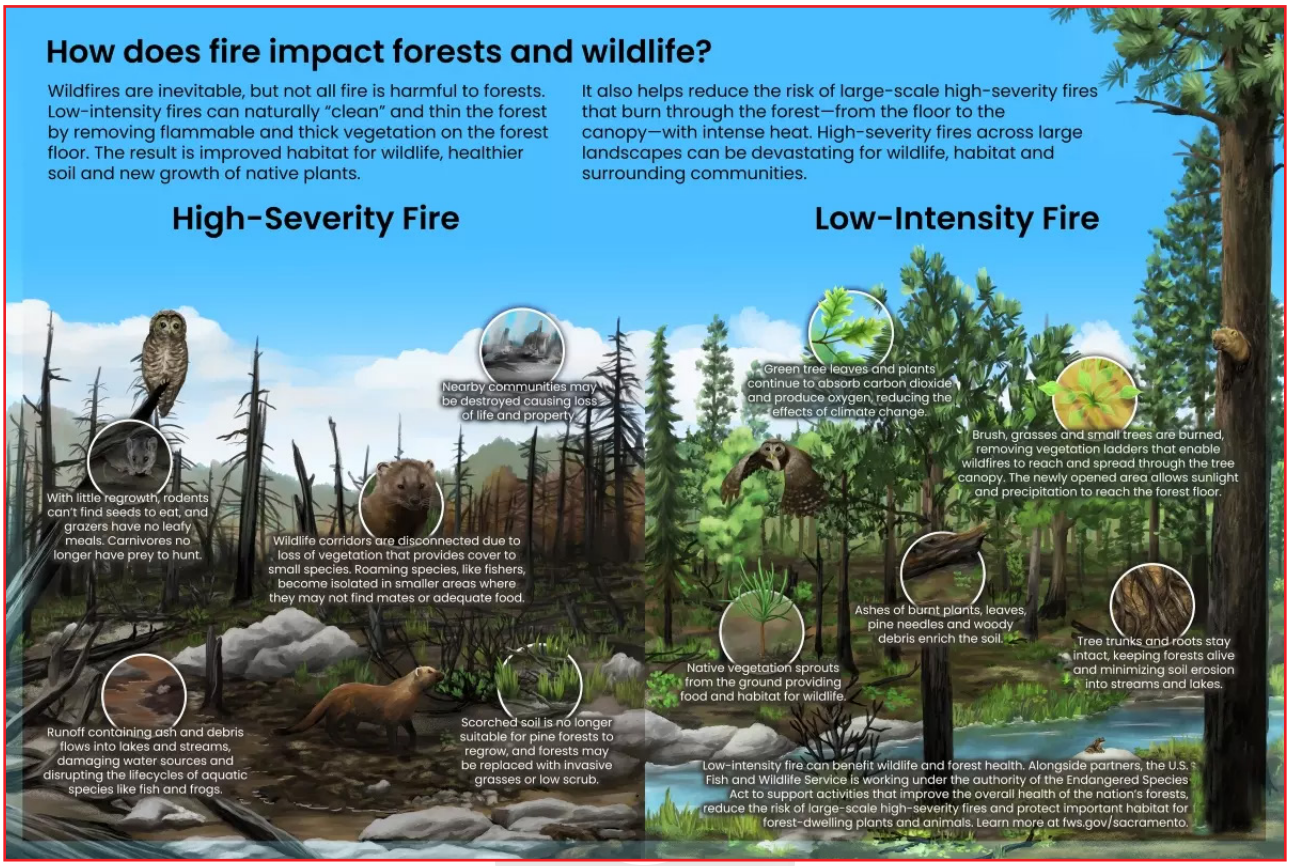


How Common are Forest Fires in India?

- **Forest Fire Season:**
  - November to June is **considered to be forest fire season** in India, with hundreds of thousands of **small and large fires burning every year**, especially from February onward as summer approaches.
    - April-May are usually the worst fire months across the country.
  - The biennial **India State of Forest Report (ISFR)** published by the **Forest Survey of India (FSI)** in its 2021 report, shows that the total Fire-prone forest area is **35.47% of the forest cover.**
- **Regions:**
  - Severe fires break out in **dry deciduous forests**, while evergreen, semi-evergreen, and montane temperate forests are comparatively less prone to fires.
  - The forests of Northeast India, Odisha, Maharashtra, Jharkhand, Chhattisgarh, and Uttarakhand are the **most vulnerable to fires during** the November to June period.
    - In 2021, a series of forest **fires broke out in Uttarakhand, Himachal Pradesh**, Nagaland-Manipur border, Odisha, Madhya Pradesh, and Gujarat, including in wildlife sanctuaries.
- **Present Scenario (2024):**
  - The highest number of forest fires have been reported from **Mizoram (3,738), Manipur (1,702), Assam (1,652), Meghalaya (1,252**), and Maharashtra (1,215), as per FSI data.
  - Satellite data of **Indian Space Research Organisation (ISRO)** tools, showed that forest fires **have been on an uptick since early March 2024** along the Konkan belt in Maharashtra, south-coastal Gujarat along Gir Somnath and Porbandar, southern Rajasthan and adjoining south-western districts of Madhya Pradesh, coastal and interior Odisha, and adjoining Jharkhand.
  - In South India, most forest-covered areas of Andhra Pradesh, Karnataka and Tamil Nadu have seen fire incidents over the past week.

What is the Reason for the Forest Fires?

- **Human Carelessness:**

Note:

- A majority of forest fires are **caused by human activities such as discarded cigarettes**, campfires, burning of debris, and other similar processes.
- With increasing urbanisation and human presence in forested areas, **the risk of accidental fires also increases.**
  - Usually, **poachers and illegal smugglers set fires** either to divert the attention of forest officials or to eliminate evidence of their crimes.

➢ **Weather Conditions:**

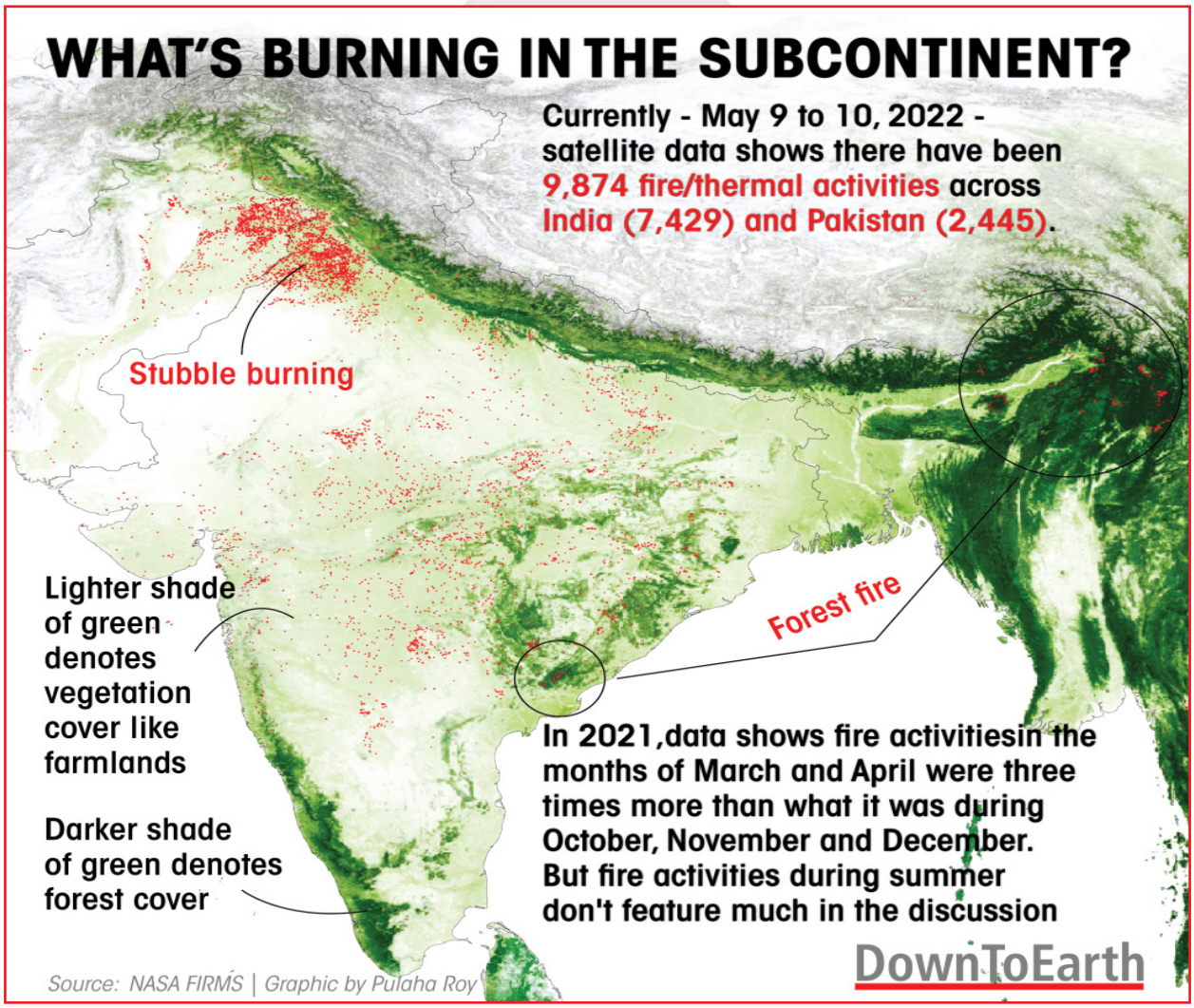
- The exceptionally **hot and dry weather conditions** experienced in southern India, particularly during the early phase of the summer season, **have created a conducive environment** for the spread of forest fires.
- High temperatures, low humidity, and **calm winds increase the likelihood of fires igniting** and spreading rapidly.

➢ **Aridity:**

- Southern India has experienced **above-normal temperatures,** clear sky conditions, and a lack of rainfall, leading to increased aridity.
- This dries out vegetation, making it more susceptible to ignition and facilitating the rapid spread of fires.

➢ **Early Availability of Dry Biomass:**

- The above-normal temperatures experienced in the months leading up to the summer season have **resulted in an early availability of dry biomass in forests.**
- This dry vegetation, **including the leaves of chir forests**, is particularly prone to igniting and spreading fires.
  - The **high flammability of chir forest leaves** raises the chances of forest fires and **adds to their intensity and rapid spread.**



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What can be Done to Mitigate Forest Fire?

- **Public Awareness and Education:**
  - Educating the public about the **causes and consequences of forest fires**, as well as promoting responsible behaviour in forests, can help reduce the incidence of human-caused fires.
  - Campaigns on fire safety, proper disposal of **cigarettes, and the dangers of leaving campfires unattended can raise awareness** and encourage responsible behaviour.
- **Strict Enforcement of Regulations:**
  - Enforcing laws and regulations r**elated to forest fire prevention**, such as restrictions on burning debris and campfire bans during dry periods, can help reduce the risk of accidental fires.
    - Penalties for violating fire safety regulations should be strictly enforced to deter irresponsible behaviour.
- **Firebreaks and Fuel Management:**
  - Creating **firebreaks and conducting controlled burns** to remove excess vegetation can help reduce the spread of fires by creating barriers and reducing fuel loads.
    - Proper fuel management practices, **such as thinning dense vegetation** and clearing deadwood, can also make forests more resilient to fires.
- **Early Detection Systems:**
  - Implementing early detection systems, such as surveillance cameras, satellite monitoring, and lookout towers, **can help detect fires in their early stages when they are easier to contain**.
    - Rapid detection allows for a quicker response, minimizing the size and impact of fires.

IPCC Reports and Equity in Climate Change Mitigation

Why in News?

Recently, a study delved into over 500 future emissions scenarios evaluated by the UN Intergovernmental Panel on Climate Change (IPCC). These scenarios offer projections for the world's climate trajectory.

- The findings of the study shed light on the **significant inequities** within the projected pathways of climate action of the IPCC Reports.

What are IPCC Assessment Reports?

- **About:**
  - The IPCC regularly releases **comprehensive assessment reports** that synthesise scientific literature on climate change.
  - These reports encompass three working group assessments focusing on physical science, climate adaptation, and mitigation actions, along with a **synthesis report consolidating their findings.**
- **Assessment of Future Scenarios:**
  - The IPCC uses 'modelled pathways' to estimate what it will take to **limit the warming of the earth's surface.**
    - These pathways are drawn using **Integrated Assessment Models (IAMs)** that describe human and earth systems.
    - IAMs are complex models that examine **possible futures of the energy and climate systems** and economies.
  - Its macroeconomic models can point to future growth levels in terms of GDP (Gross Domestic Product); its energy models can project future consumption; vegetation models can examine land-use changes; and earth-system models use the laws of physics to understand how climate evolves.
  - With such integration across disciplines, IAMs are meant to **provide policy-relevant guidelines on climate action**.
  - However, these models also have shortcomings. They prioritise **least-cost assessments**,
    - For example, the absolute cost of setting up a solar plant or undertaking afforestation in India is **lower than in the US.**
    - However, experts have suggested facilitating a scenario of enabling countries to equitably share the burden of Climate action, with

Note:

wealthier nations taking **on more immediate and comprehensive mitigation measures.**

What are the Findings of the New Study?

- Researchers analyzed 556 scenarios in the **IPCC's AR6 report** and found troubling projections. They predict that by 2050, regions **encompassing 60% of the world's population**, including Sub-Saharan Africa and South, West, and East Asia (except China), will still have **below** the **global average per-capita GDP.**
  - Similar disparities in consumption of goods, energy, and fossil fuels **exist between the Global North and South.**
- Moreover, these scenarios indicate that **developing nations will shoulder a heavier burden** in terms of **carbon sequestration** and **Carbon Capture and Storage (CCS)** technologies.
  - This unfairly places the responsibility for mitigation and carbon dioxide removal on poorer countries.
- The researchers criticise the scenarios for **ignoring the historical responsibility of wealthier nations** and failing to address the energy needs of the **Global South** to achieve development goals.
  - This highlights **significant inequities within the projected pathways** of climate action.

Why Does Equality Matters in Tackling Climate Change?

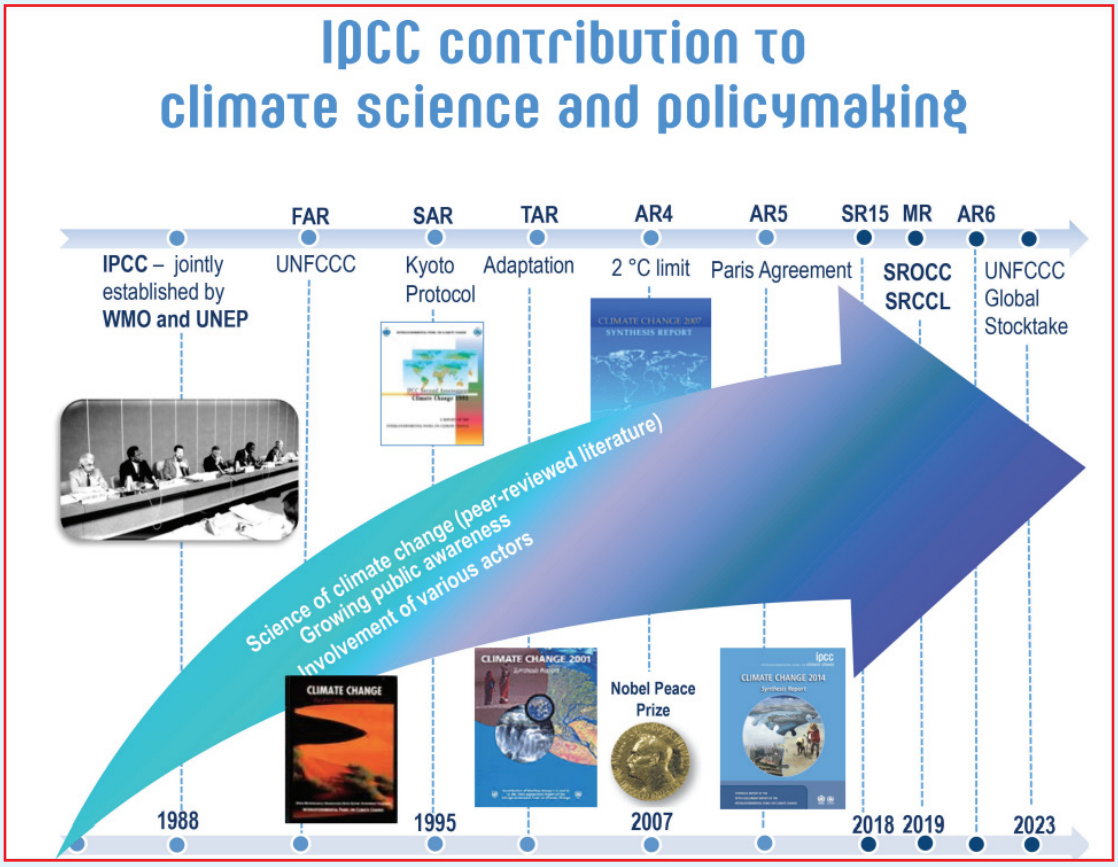
- **Historical Responsibility:**
  - Wealthier nations, **particularly those in the Global North**, have historically contributed the most to **greenhouse gas emissions** through industrialisation and economic development.
  - These historical emissions have **disproportionately contributed to climate change.**
  - Recognising this historical responsibility is essential in addressing climate change fairly.
- **Vulnerability of Developing Countries:**
  - Developing countries, often the **least responsible for greenhouse gas emissions, are the most vulnerable** to the impacts of climate change. They often lack the resources and infrastructure to adapt to climate change-related challenges such as extreme weather events, sea-level rise, and changing agricultural conditions.
  - Equity considerations are **crucial in ensuring that vulnerable communities receive the necessary support** and resources to adapt to climate change impacts.
- **Access to Resources:**
  - Access to resources for mitigation and adaptation efforts is unequal between developed and developing countries.
  - Wealthier nations generally have **greater financial resources,** technological capabilities, and infrastructure to invest in renewable energy, climate-resilient infrastructure, and adaptation measures.
  - Equity ensures that **developing countries have equitable access to Climate funding, technology transfer**, and capacity-building support to address climate change effectively.
- **Social Justice:**
  - Climate change exacerbates existing social inequalities and injustices. Vulnerable communities, including **marginalised groups, indigenous peoples, and low-income populations**, often bear the brunt of climate impacts.
  - Equity in climate action involves **addressing these social injustices and ensuring that climate policies** and measures benefit all members of society, particularly those most affected by climate change.
- **Global Cooperation:**
  - Achieving meaningful progress in addressing climate change requires global cooperation and solidarity.
  - Equity principles, such as **common but differentiated responsibilities,** foster cooperation by **acknowledging the varying capacities and responsibilities of countries in addressing climate change**.
  - Ensuring equity in climate action builds trust and fosters collaboration among nations to work towards shared climate goals.

Note:

Police Custody And Judicial Custody

Intergovernmental Panel on Climate Change (IPCC)

- **About:**
  - The Intergovernmental Panel on Climate Change (IPCC) is the **international body for assessing** the science related to climate change.
  - It was **set up in 1988 by the** World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.
  - IPCC assessments provide a **scientific basis for governments at all levels to develop climate-related policies**, and they underlie negotiations at the UN Climate Conference – the United Nations Framework Convention on Climate Change (UNFCCC).
- **IPCC Assessment Report:**
  - Since 1988, the IPCC has **had six assessment cycles and delivered six Assessment Reports**, the most comprehensive scientific reports about climate change produced worldwide. They are,
    - First Assessment Report (FAR) (1990).
    - The Second Assessment Report (SAR) (1995)
    - Third Assessment Report (TAR) (2001)
    - Fourth Assessment Report (AR4) (2007)
    - **The Fifth Assessment Report (AR5) (2014)**
    - **The Sixth Assessment Report (AR6) (2023)**
    - **The IPCC is currently (2024) in its Seventh Assessment cycle (AR7).**



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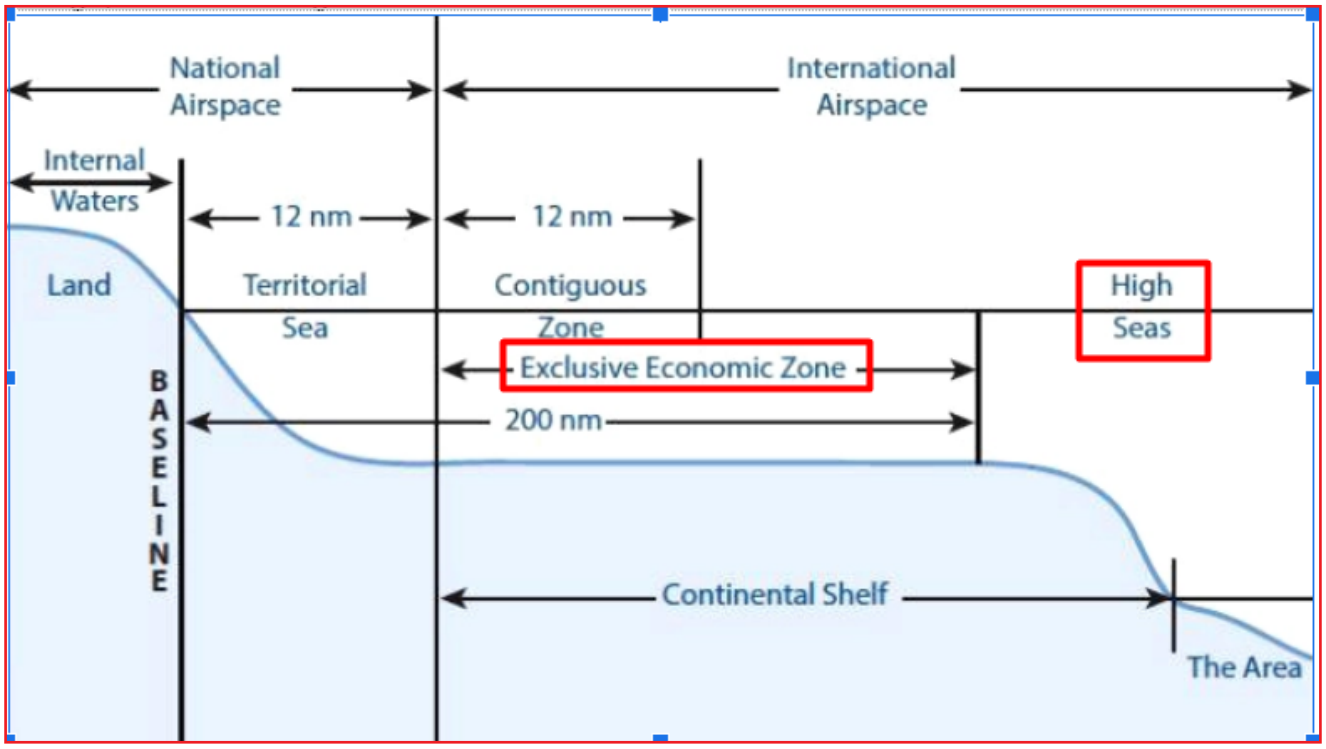
BBNJ Treaty

Why in News?

The **Blue Leaders High-Level Event on** **Biodiversity Beyond National Jurisdiction** took place in Belgium, encouraging nations to ratify the **Marine Biodiversity of Areas Beyond National Jurisdiction (BBNJ) treaty** aimed at protecting the high seas from pollution, climate change, and overfishing.



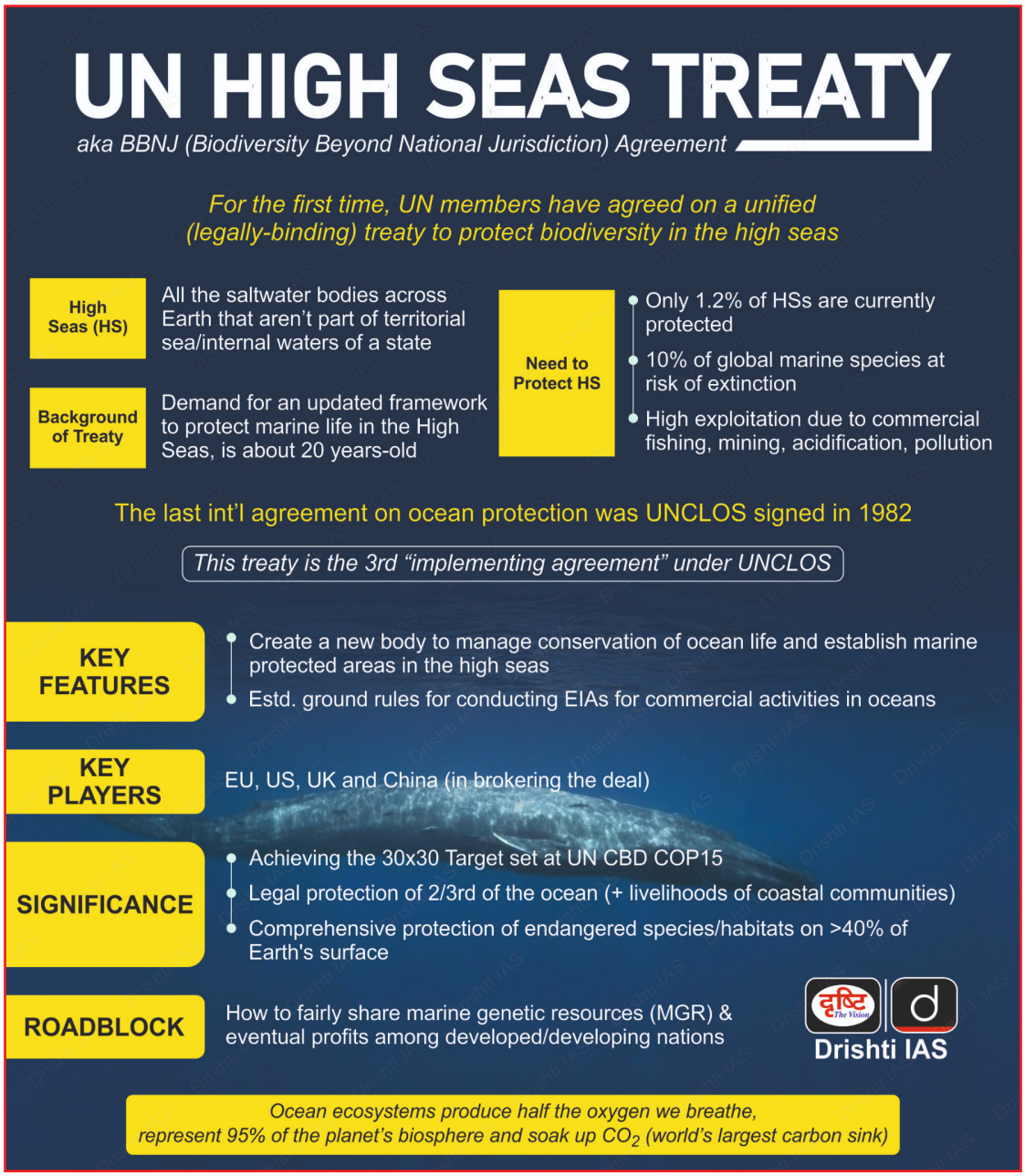
What is the BBNJ Treaty?

- **About:**
  - The BBNJ treaty commonly referred to as the **Treaty of the High Seas** was agreed upon in March 2023 for the conservation and sustainable use of marine biological diversity in areas **beyond national jurisdiction**.
    - It represents a crucial step towards conserving and sustainably managing **marine biological diversity in areas beyond national jurisdiction.**
- **Ratification Progress:**
  - The treaty aims to address the challenges faced by the high seas, which constitute areas beyond **200 nautical miles from the exclusive economic zones of coastal countries**.
    - So far, 88 countries have signed the treaty, with **Chile and Palau being the only two to have ratified it.**
    - However, at least 60 ratifications are necessary for it to come into force.
- **Objectives:**
  - The treaty seeks to increase the **percentage of protected areas on the high seas**, which **currently stands at a mere 1.44%,** despite covering more than **two-thirds of the global ocean.**
  - Additionally, it aims to **ensure fair and equitable sharing of profits from marine genetic resources (MGR)** and establish rules for conducting **Environmental Impact Assessments (EIA),** which deal with identifying and evaluating the potential impacts an activity could have on the ocean.
  - This aligns with **the 30x30 target,** it is a global commitment to protect at least **30% of the planet for nature by 2030.** It was agreed upon at the **Convention on Biological Diversity (CBD)**

Note:

at the **Conference of Parties (COP15) to the UN Convention on Biological Diversity** in 2022 and is included in the **Kunming-Montreal Global Biodiversity Framework.**

- **Challenges:**
  - Despite widespread support for the treaty, concerns persist regarding **potential delays in ratification,** echoing past challenges faced by similar international agreements like the **United Nations Convention on the Law of the Seas.**
  - Additionally, operationalising the treaty poses logistical hurdles, including defining procedural frameworks and securing adequate funding.
- **Moving Forward:**
  - Efforts towards the treaty's entry into force and subsequent implementation require concerted global collaboration.
    - The upcoming **United Nations Ocean Conference in 2025** is identified as a crucial platform for advancing these objectives.



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Security

Highlights

- *India Leads Global Arms Imports Amid Shifting Dynamics*
- *Role of the Internet in Drug Trafficking*

India Leads Global Arms Imports Amid Shifting Dynamics

Why in News?

The latest data on international arms transfers from Stockholm International Peace Research Institute (SIPRI), India emerged as the **leading arms importer globally during the period from 2019 to 2023**.

- During this timeframe, India's imports increased by **4.7%** when compared to the period from 2014 to 2018.

What are the Key Highlights of Recent SIPRI Data?

- **Arms Importers:** Nine of the 10 biggest arms importers in 2019–23, including the top 3 of **India, Saudi Arabia and Qatar,** were in Asia and Oceania or the Middle East.
  - Notably, Ukraine also rose as the **4th-largest arms importer** globally during this period.
- **Arms Exporters:** The **United States**, the largest arms supplier globally, witnessed a 17% growth in arms exports between the periods 2014 –18 and 2019–23.
  - Concurrently, France ascended to become the **world's second-largest arms supplier**.
  - Europe accounted for a third of global arms exports, with a strong military-industrial capacity.
  - In contrast, Russia experienced a significant decline of more than half, with a decrease of **-53%**
- India's Arms Import **Dynamics:** Although Russia remained India's primary arms supplier, accounting for **36% of its arms imports,** this marked the first five-year period since 1960-64 where Russian deliveries made up less than half of India's total arms imports.
  - India is now increasingly turning to Western countries like **France and the USA,** as well as boosting its domestic arms industry, to meet its growing defence needs.

What is SIPRI?

- It is an independent international institute dedicated to research into conflict, armaments, arms control and disarmament.
- It was established in **1966 in Stockholm (Sweden).**
- It provides data, analysis and recommendations, based on open sources, to policymakers, researchers, media and the interested public.

What are the Recent Indian Government Initiatives to Reduce Arms Imports?

- **About**: The Indian Defence sector, the second largest armed force is at the cusp of revolution.
  - In the Interim Budget 2024-25, the Defense Ministry received a total allocation of ₹6.2 lakh crore.
  - Within this allocation, ₹1.72 lakh crore was designated for capital expenditure, specifically for new procurements.
    - This capital allocation reflected a **5.78% increase** compared to the Budget Estimates from 2023-24.
- **Initiatives:**
  - **Positive Indigenisation Lists:** The government releases Positive Indigenisation Lists to identify specific components and subsystems that must be manufactured domestically.
    - The Department of Military Affairs has recently released the **5th Positive Indigenisation List,** which includes 98 items, further bolstering indigenous manufacturing in the defence sector.
  - **Increased FDI Limits in the Defence Sector:** It has been increased in 2020 to **74%** through

Note:

the Automatic Route and up to **100%** via the Government Route.

- **Defence Industrial Corridors:** Two dedicated Defence Industrial Corridors have been established in Tamil Nadu and Uttar Pradesh to boost defence manufacturing.
  - The Uttar Pradesh corridor encompasses nodes in Agra, Aligarh, Chitrakoot, Jhansi, Kanpur, and Lucknow.
  - The Tamil Nadu corridor includes nodes in Chennai, Coimbatore, Hosur, Salem, and Tiruchirappalli.
- **Innovations for Defence Excellence (idEX):** iDEX aims to create an ecosystem for innovation and technology development in Defence and Aerospace.
  - It engages various stakeholders such as industries, MSMEs, startups, innovators, R&D institutes, and academia, providing them grants, funding, and support for R&D with potential for **Indian defence and aerospace needs.**
  - The initiative is funded and managed by the **Defence Innovation Organization (DIO),** established as a not-for-profit company under the Companies Act 2013.
- **SRIJAN Portal:** It is a one-stop shop for vendors to find opportunities to manufacture defence equipment that was previously imported.
  - Defence Public Sector Undertakings (DPSUs) and other government agencies can use SRIJAN to post details about specific items they want indigenized.
  - This allows Indian companies to express their interest and collaborate on production.

Role of the Internet in Drug Trafficking

Why in News?

Recently, the International Narcotics Control Board in its 2023 Annual Report, highlighted that online Drug Trafficking has **increased the availability of drugs on the illicit market.**

Drug Trafficking:

- Drug trafficking refers to the **illegal trade involving the cultivation**, manufacture, distribution, and sale of illicit drugs.
- It encompasses a **wide range of activities associated with the illegal drug trade**, including the production of drugs such as **cocaine, heroin, methamphetamine, and synthetic drugs**, as well as the transportation and distribution of these substances.
- Drug trafficking **operates within a complex network of criminal organisations** that span across borders, regions, and even continents.

What are the Key Highlights of the Annual Report by the International Narcotics Control Board?

- **Regional Drug Supply Trends:**
  - In Afghanistan, illicit opium poppy cultivation and heroin production declined dramatically.
  - The opioid crisis continues to have **serious consequences in North America** with the number of deaths that involve synthetic opioids other than methadone continuing to increase, **reaching more than 70,000 in 2021.**
  - Drug trafficking organisations continue to expand their operations in the Amazon **Basin into illegal mining**, illegal logging and wildlife trafficking.
  - Record levels of illicit coca bush cultivation were recorded in Colombia and Peru, rising by 13% and 18% respectively.
  - Seizures of cocaine reached a record level in 2021 in West and Central Africa, a significant transit region for cocaine.
  - **South Asia** appears to be increasingly being targeted for the trafficking of **methamphetamine illicitly** manufactured in Afghanistan to Europe and Oceania.
  - Pacific island States have transformed from solely transit sites along drug trafficking routes to destination markets for synthetic drugs.
    - This is posing significant challenges to communities and their public health systems.

Note:

- **Challenges in Online Drug Trafficking:**
  - There is an evolving landscape of **online drug trafficking**, presenting new challenges to drug control.
  - The increased availability of **illicit drugs on the Internet**, exploitation by criminal groups of online platforms, and the risk of overdose deaths due to the online presence of **synthetic opioids like fentanyl** are significant challenges.
- **Exploitation of Online Platforms:**
  - Criminals are **exploiting legitimate e-commerce platforms**, social media, and other online platforms for drug trafficking.
  - Encryption methods, anonymous browsing on the darknet, and cryptocurrencies are **used to avoid detection**, making it **difficult to prosecute** online trafficking offences.
    - France's law enforcement authorities collected more than 120 million text messages **from 60,000 mobile phones.**
- **Concerns about Patient Safety:**
  - Patient safety is at risk from illicit Internet pharmacies that sell drugs without a prescription directly to consumers.
  - It is impossible for consumers to know whether the drugs are counterfeit, unapproved or even illegal.
  - The global trade in illicit pharmaceuticals is estimated **to be worth 4.4 billion USD**.
- **Recommendations:**
  - Despite challenges, there are opportunities to **use online platforms for drug use prevention, awareness campaigns**, and improving access to drug treatment services.
    - Governments **can use social media platforms to conduct drug use prevention** campaigns to prevent substance misuse among young people in particular.
  - **Telemedicine and Internet pharmacies** could improve access to healthcare and help reach patients with drug use disorders and deliver drug treatment services to more people.
  - Online platforms could also be **used for sharing information about the adverse consequences of drug use** and communicating warnings of adulterated drugs which could save lives.
  - Placing certain **amphetamine-type stimulant precursors and fentanyl precursors under international control** to prevent illicit drug manufacturers from substituting controlled chemicals with closely related substitutes.
  - Given the global nature of online platforms, **collaborative efforts between governments, international organizations**, regulatory authorities, and the private sector are essential to identify new threats and develop effective responses.
    - INCB encourages voluntary cooperation to tackle the misuse of legitimate e-commerce platforms for drug trafficking.

International Narcotics Control Board

- The International Narcotics Control Board (INCB) is the **independent and quasi-judicial monitoring body** for the implementation of the United Nations international drug control conventions.
- It was established in 1968 in accordance with the **Single Convention on Narcotic Drugs, 1961.**
- Its secretariat is **located in Vienna, Austria.**
  - India's Narcotics Control Bureau (NCB), cooperates with the INCB.

Narcotics Control Bureau

- It was constituted by the Government of India in **1986 under the Narcotic Drugs and Psychotropic Substances Act, 1985.**
- It is the **apex coordinating agency** under the **Ministry of Home Affairs.**
- The National Policy on Narcotic Drugs and Psychotropic Substances is based on **Article 47 of the Indian Constitution** which directs the State to endeavour to bring about prohibition of the consumption, except for medicinal purposes, of intoxicating drugs injurious to health.

What are the Initiatives Taken by India to Curb the Drug Menace?

- **The Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985:** It prohibits a person from **producing, possessing, selling, purchasing, transporting**, storing, and/or consuming any narcotic drug or psychotropic substance.

Note:

- **The National Fund for Control of Drug Abuse was** also created under a provision of the NDPS Act, 1985, to meet the expenditure incurred in the implementation of the Act.

- **National Action Plan for Drug Demand Reduction:** The **Ministry of Social Justice and Empowerment** has prepared a plan for Drug Demand Reduction for 2018-25.
  - This plan **focuses on preventive education, awareness generation, identification, counselling,** treatment, and rehabilitation of drug-dependent persons, as well as **training and capacity building of service providers** through collaborative efforts of government and **Non-governmental Organizations (NGOs).**
- **Nasha Mukt Bharat Campaign (NMBA):** NMBA was launched in 2020 to tackle the issue of Substance Abuse and a vision to make India drug-free. **It is a three-pronged attack combining:**
  - The supply curb by the **Narcotics Control Bureau**
  - Outreach and Awareness and Demand Reduction efforts by Social Justice and Empowerment
  - Treatment through the Health Department.
- **International Treaties and Conventions to Combat Drug Menace:** India is a signatory of the following international treaties and conventions:
  - **United Nations (UN) Convention on Narcotic Drugs (1961)**
  - **UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988)**
  - **UN Convention on Psychotropic Substances (1971)**
  - **UN Convention against Transnational Organized Crime (UNTOC) 2000**

Note:

Art and Culture

Highlights

- *Pandavula Gutta and Ramgarh Crater as Geo-Heritage Sites*

In the past, kings would ride through the city on elephant backs on Holi and toss Gulaal Gotas to the public, and the erstwhile royal family ordered Gulaal Gota at its palace for the festival.

- **Challenges and Future Prospects:**
  - The demand for lac-only bangles has fallen, as Jaipur has become a hub of factories producing cheap, chemical-based bangles.
  - The government of India has provided **"artisan cards" to Lac Bangle and Gulaal Gota makers**, allowing them to avail benefits from government schemes.
  - Some Gulaal Gota makers have demanded a **Geographical Indication (GI) tag** to safeguard their product against imitation and boost awareness of its location-specific exclusivity.

Unique Holi Traditions Across India:

- **Holla Mohalla in Punjab:**
  - Integral to Sikh tradition, Holla Mohalla is observed in Anandpur Sahib with **martial arts demonstrations, poetry, and kirtans.**
- **Phaguwa in Bihar:**
  - Phaguwa, also known as Phagwah or Phalgunotsava, celebrates the arrival of spring and the harvest season.
    - Folk songs and Holika Dahan precede the colourful festivities, creating a vibrant environment.
- **Lathmar Holi in Uttar Pradesh:**
  - Celebrated in Barsana and Nandgaon, the hometowns of Radha and Lord Krishna, Lathmar Holi reenacts a playful tale of Lord Krishna teasing Radha.
    - Women playfully hit men with sticks, symbolising the enduring love between Radha and Krishna.
- **Yaoshang in Manipur:**
  - A blend of Hindu and Manipuri traditions, Yaoshang features the **Thabal Chongba dance (folk dance from Manipur)** and sports competitions.
  - The festival is generally celebrated at the same time as Holi.
- **Ukuli in Kerala:**
  - Celebrated by the Kudumbi and Konkani communities, Ukuli in Kerala features music, dance, and turmeric colours.
    - Boat races add excitement to the festivities, while praises of Lord Krishna resonate throughout the celebrations.

Pandavula Gutta and Ramgarh Crater as Geo-Heritage Sites

Why in News?

Pandavula Gutta, an ancient geological marvel predating the Himalayan hills, has been officially designated as the **sole Geo-heritage site in Telangana.**

- Also, the Rajasthan government designates **Ramgarh Crater in Baran district** as a geo-heritage site.
- The recognition marks a significant milestone in preserving the region's geological legacy.

Note:

What are the Key Facts About Pandavula Gutta?

- Pandavula Konda (Pandavula Gutta) is a geological marvel situated in the **Jayashankar Bhupalpally district of Telangana.**
- Pandavula Gutta is rich in terms of rock shelters, and habitation from **the Mesolithic period (about 10,000 B.C. to 8,000 B.C.) to mediaeval times.**
- Pandavula Gutta boasts **Palaeolithic (500,000 BCE–10,000 BCE)** cave paintings offering a glimpse into prehistoric life.
  - The cave paintings depict wildlife like Bison, Antelope, Tiger, and Leopard, as well as **shapes like swastika symbols,** circles, squares, and weapons.
  - The paintings also feature geometrical designs and impressions in green, red, yellow, and white pigment colours.
- The topography of Pandavula Gutta makes it a popular destination for rock climbing enthusiasts.

What are the Key Facts About Ramgarh Crater?

- Ramgarh Crater, Rajasthan formed around **165 million years ago** due to a **meteor** impact, this 3-km diameter crater provides essential ecosystem services, contributing to the region's ecological balance and biodiversity.
- Recognised as a **Ramgarh Conservation Reserve under the Wildlife (Protection) Act, 1972,** the Ramgarh Crater is protected to preserve its unique ecological and cultural heritage.
- It is declared as the Ramgarh Conservation Reserve under the Wildlife (Protection) Act, 1972 and the presence of **Pushkar Talab complex within the crater**, recognised as **wetlands** under **Wetland (Conservation & Management) Rules, 2017.**

Geo-Heritage Site/National Geological Monuments

- Geoheritage refers to **sites or areas with significant scientific, educational, cultural, or aesthetic value** due to their geological features.
  - These sites may have **unique rock formations, fossils, or landscapes** that are important for education, research, cultural significance, or visual appeal. They can also contribute to local and regional economies as tourist destinations.
  - GSI or the respective State governments take necessary measures to protect these sites.
- **The Geological Survey of India (GSI)** declares geo-heritage sites/**national geological monuments** for protection and maintenance.
  - GSI is a scientific agency that was founded in 1851 to find **coal deposits for the Railways**. The GSI is **headquartered in Kolkata,** and is an attached office to the **Ministry of Mines.** Its main functions include creating and updating national geoscientific information, and assessing mineral resources.

Note:

Geological heritage site /National geological monument	
ANDHRA PRADESH	▪ Volcanogenic bedded Barytes, Mangampeta, Cuddapah Dist. ▪ Eparchaean Unconformity, Chittor Dist. ▪ Natural Geological Arch, Tirumala Hills, Chittor Dist. ▪ Erra Matti Dibbalu- the dissected and stabilized coastal red sediment mounds located between Vishakhapatnam and Bhimunipatnam.
KERALA	▪ Laterite near Angadipuram PWD rest house premises, Malapuram Dist. ▪ Varkala Cliff Section, Thiruvanatapuram Dist.
TAMILNADU	▪ Fossil wood near Tiruvakkarai, South Arcot Dist. ▪ National fossil wood park, Sattanur, Tiruchirapalli Dist. ▪ Charnockite, St. Thomas Mount, Madras. ▪ Badlands of Karai Formation with Cretaceous fossils along Karai – Kulakkalnattam Section, Perambalur District.
MAHARASHTRA	▪ Lonar Lake, Buldana Dist.
GUJARAT	▪ Sedimentary Structures – Eddy Markings, Kadan Dam, Panch Mahals Dist.
RAJASTHAN	▪ Sendra Granite, Pali Dist. ▪ Barr Conglomerate, Pali Dist. ▪ Stromatolite Fossil Park, Jharmarkotra Rock Phosphate deposit, Udaipur Dist. ▪ Gossan in Rajpura-Dariba Mineralised belt, Udaipur Dist. ▪ Stromatolite Park near Bhojunda, Chittaurgarh Dist. ▪ Akal Fossil Wood Park, Jaisalmer Dist. ▪ Kishangarh Nepheline Syenite, Ajmer Dist. ▪ Welded Tuff, Jodhpur Dist. ▪ Jodhpur Group – Malani Igneous Suite Contact, Jodhpur Dist. ▪ Great Boundary Fault at Satur, Bundi Dist.
KARNATAKA	▪ Columnar Lava, St Mary Island Udupi Dist. ▪ Pillow lavas near Mardihalli, Chitradurga Dist. ▪ Peninsular Gneiss, Lalbagh, Banglore ▪ Pyroclastics & Pillow lavas, Kolar Gold fields, Kolar Dist.
CHATTISGARH	▪ Lower Permian Marine bed at Manendragarh, Surguja Dist.
HIMACHAL PRADESH	▪ Siwalik Fossil Park, Saketi, Sirmur dt.,
ODISHA	▪ Pillow Lava in Iron ore belt at Nomira, Keonjhar dist.
JHARKHAND	▪ Plant Fossil bearing Inter-trappean beds of Rajmahal Formation, upper Gondwana sequence around Mandro, Sahibganj dist.
NAGALAND	▪ Nagahill Ophiolite Site near Pungro,
SIKKIM	▪ Stromatolite bearing Dolomite / Limestone of Buxa Formation at Mamley, near Namchi, South district.

Read more: Draft Geo-heritage Sites and Geo-relics Bill, 2022

■■■

Note:

History

MAJOR CIVILISATIONS OF THE WORLD

MESOPOTAMIA, 4000-3500 BC

- Modern-day Iraq and parts of **Iran, Syria, Kuwait,** and **Turkey,** between **Tigris** and **Euphrates Rivers**
- Known as **Fertile Crescent/Cradle of civilization**
- Diverse collection of cultures bound by their script, gods, and views on women
- **Highly esteemed education system** (law, medicine, and astrology, reflecting rich cultural and religious landscape)
- Both **men and women were involved in diverse occupations**
- **Cities built around ziggurats,** step-pyramid temples, honoured their patron deity
- Cities, made of **sun-dried brick,** were the world's first

ANCIENT EGYPT, 3100 BC

- Set along fertile **Nile River**
- Most known for **pyramids, tombs, and mausoleums** practice of mummification to prepare corpses for afterlife
- Left legacy of monumental writing and mathematics systems
- Civilization **ended in 332 BC** with Alexander the Great's conquest

INDUS VALLEY CIVILISATION, 3300 BC

- Located in modern-day **India, Afghanistan, and Pakistan**
- Relatively peaceful compared to other ancient civilizations, with little evidence of widespread warfare
- **Organised city planning,** complete with **uniform baked-brick homes,** a grid structure, and drainage, sewage, and water supply systems
- **Declined around 1800 BC,** actual reasons behind demise still debated (theories propose Aryan invasion or climatic & natural factors for decline)

ANCIENT CHINA, 2000 BC

- Protected by the Himalayan Mountains, Pacific Ocean, and Gobi Desert, and **situated between Yellow and Yangtze rivers**
- Flourished in isolation from invaders and other foreigners for centuries
- Generally divided into four dynasties—**Xia, Shang, Zhou, and Qin** - ancient China was ruled by a succession of emperors
- Credited with developing the **decimal system, abacus, and sundial,** as well as **the printing press**
- Mobilised populations to build massive infrastructure projects (like Egyptians)

Drishti IAS

Note:

Geography

Highlights

- *India Joins Sri Lanka in Seabed Mining Race*
- *Integrated River Basin Management*
- *Menace of Illegal Migration*
- *Black Sea*

India Joins Sri Lanka in Seabed Mining Race

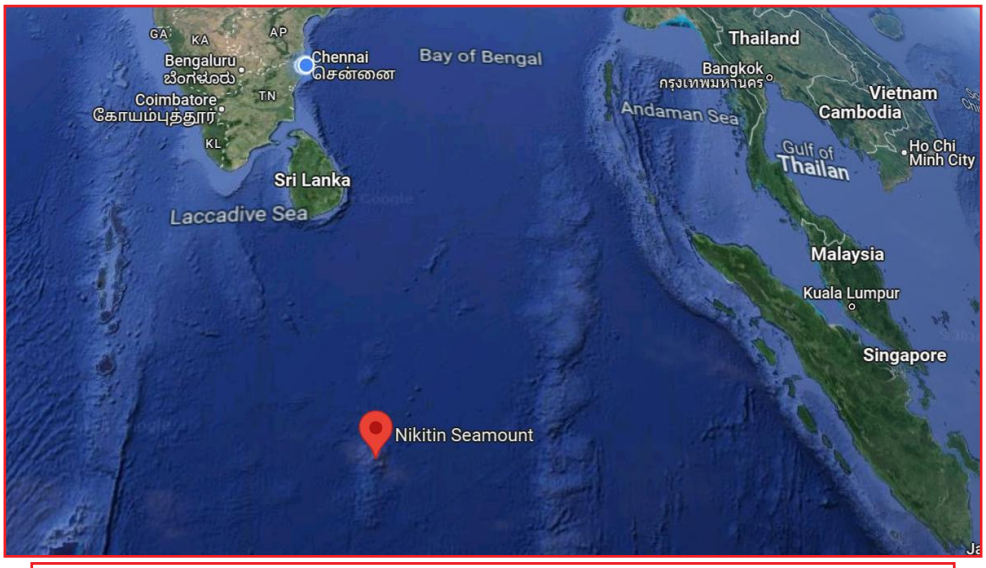
Why in News?

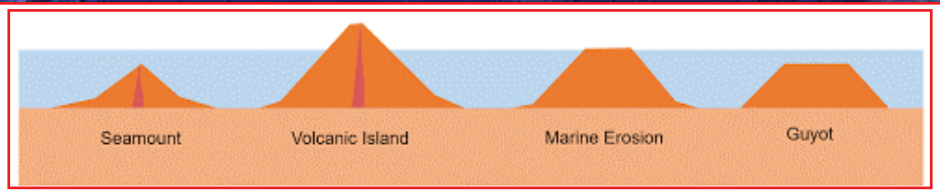
Recently, India applied for Rights to Explore the Indian Ocean Seabed Beyond its Jurisdiction, Including **Cobalt-Rich Afanasy Nikitin Seamount (AN Seamount).** India's interest is fueled by concerns over Chinese vessels conducting reconnaissance there.

- Rights to the region have already been claimed by **Sri Lanka** under a separate set of laws.

What is Afanasy Nikitin Seamount (AN Seamount)?

- The **AN Seamount** is a structural feature (400 km long and 150 km wide) in the Central Indian Basin, located about 3,000 km away from India's coast.
- From an oceanic depth of about 4,800 km, it rises to about 1,200 meters and it is rich in deposits of **cobalt, nickel, manganese and copper.**
- To proceed with extraction, interested parties/ countries must first apply for an exploration license to the **International Seabed Authority (ISBA).** This organisation operates autonomously under the **United Nations Convention on the Law of the Sea (UNCLOS).**
- These rights are specific to areas that are part of the open ocean. **Around 60% of the world's seas are open ocean** and though believed to be rich in a variety of mineral wealth, the costs and challenges of extraction are prohibitive.

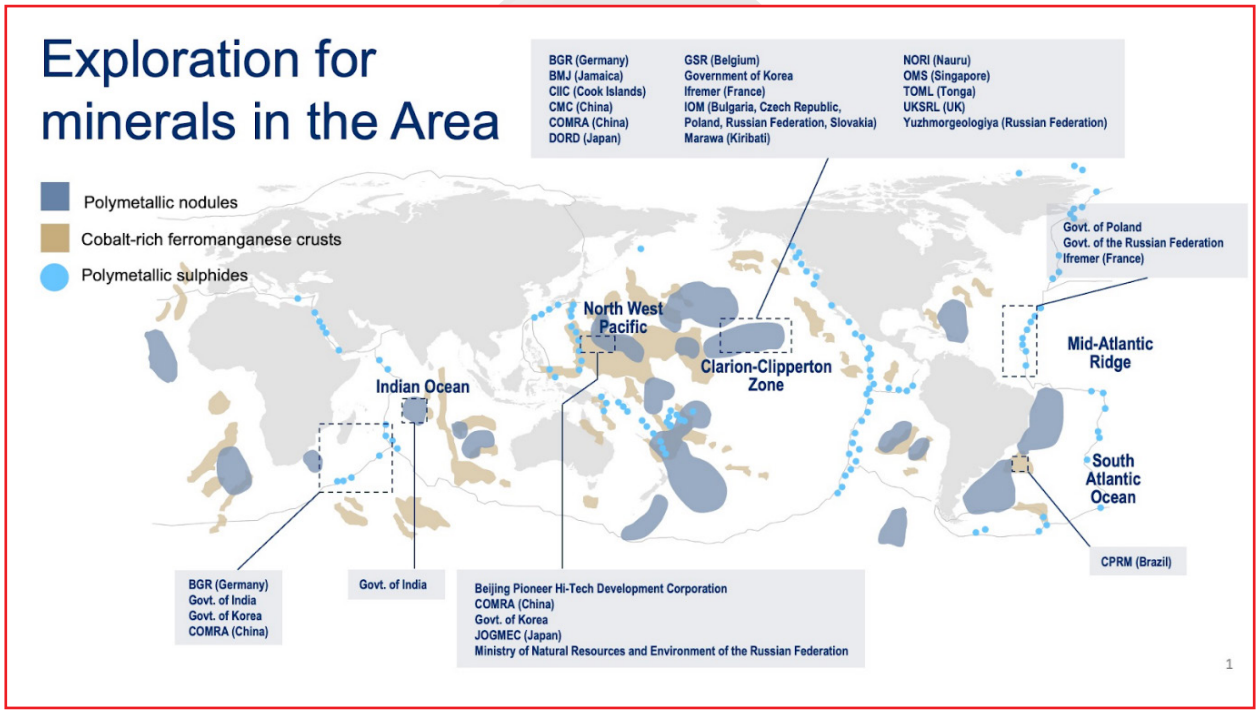




Note:

Which Countries have been Provided with Exploration Licences?

- Both state-owned and government-sponsored companies from **India, France, Russia, Germany, China, Singapore** and the **UK** had sought permission for minerals prospecting in the high seas.
- **Licence Granted:**
  - Four licences have been granted for the **Pacific Ocean**, the **Clarion Clipperton Zone** between **Hawaii** and **Mexico** and the **Magellan Seamount** in the **northwest Pacific**.
  - Two licences are for the **Indian Ocean Ridge**, while one for **Rio Grande Rise** in the **southern Atlantic.**
- **India's Exploration Applications:** Along with the application for AN Seamount, India has also applied for permission to explore another region, spanning **3,00,000 square km,** called the **Carlsberg Ridge** in the **Central Indian Ocean** to investigate for **polymetallic sulphides**, which are **large smoking mounds** near **hydrothermal vents** that are reportedly rich in **copper, zinc, gold** and **silver.**
- **Previous Exploration Efforts:** India has previously secured exploration rights to two other large basins in the **Central Indian Ocean** and has undertaken surveys in these regions, demonstrating its commitment to marine exploration and resource assessment.
  - India has been studying the seabed and carrying out test mining for about two decades through institutes like **National Institute of Oceanography (NIO) and National Institute of Ocean Technology (NIOT) .**



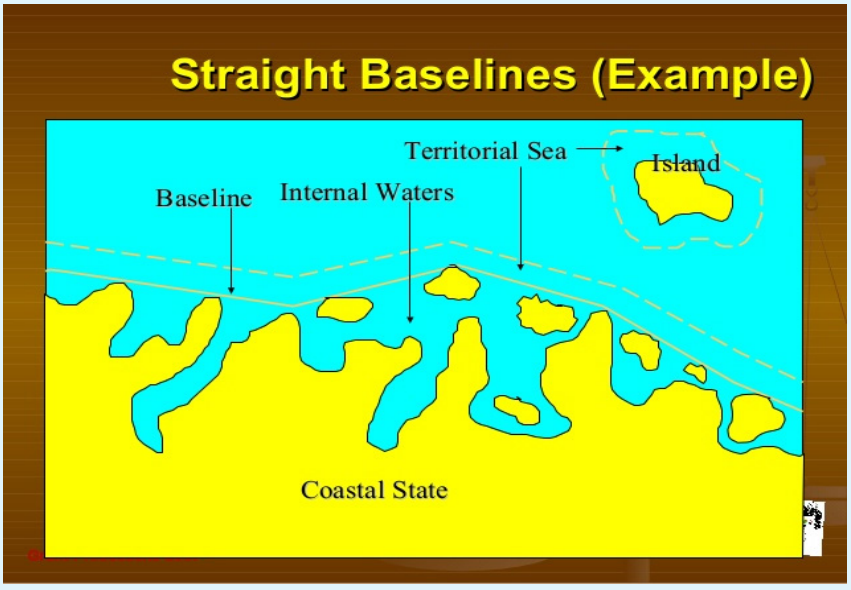
What is Deep Sea Bed Mining?

- **Deep-sea mining** involves extracting valuable mineral deposits from the ocean floor at depths ranging from **200** to **6,500 meters** below the surface.
  - These mineral deposits include materials such as **copper, cobalt, nickel, zinc, silver, gold,** and **rare earth elements.**
  - **NIO** has tested deep-sea mining systems up to **512 meters depth** and is working on systems for up to **6,000 meters.**
- Establishing **deep-sea mines** was earlier considered more expensive than **land-based mining.**
- Innovations in **underwater robotics** from the **petroleum industry** have improved prospects for **deep-sea mining.**

Note:

What are the Different Maritime Zones?

- **Baseline:**
  - A **baseline refers** to a line, **often along the coastline**, serving as a reference point for measuring the outer boundaries of a state's territorial sea and other maritime zones, such as its exclusive economic zone.
  - Typically, this baseline mirrors the low-water mark of the coastal state. In cases where the **coastline is deeply indented, contains islands close to the shore,** or exhibits significant instability, straight baselines may be established instead.
- **Internal Waters:**
  - Internal waters are **waters on the landward side of the baseline** from which the breadth of the territorial sea is measured.
  - **Each coastal state has full sovereignty over its internal waters** as like its land territory. **Examples** of internal waters include bays, ports, inlets, rivers and even lakes that are connected to the sea.
  - There is **no right to innocent passage** through internal waters.
    - **The innocent passage refers** to the passing through the waters which are not prejudicial to peace and security. However, the nations have the right to suspend the same.
- **Territorial Sea:**
  - The territorial sea **extends seaward up to 12 nautical miles (nm) from its baselines.**
    - The coastal states have **sovereignty and jurisdiction over the territorial sea.** These rights extend not only to the surface but also to the seabed, subsoil, and even airspace.
  - However, the coastal states' rights are **limited by the innocent passage** through the territorial sea.



- **Contiguous Zone:**
  - The **contiguous zone** adjacent to and beyond its **territorial sea** that extends seaward up to **24 nm** from its baselines.
  - It is **an intermediary zone between the territorial sea and the high seas.**
  - The coastal state has the right to both prevent and punish infringement of fiscal, immigration, sanitary, and customs laws within its territory and territorial sea.

Note:

- Unlike the territorial sea, the contiguous zone **only gives jurisdiction to a state on the ocean's surface and floor**. It does not provide air and space rights.

➢ **Exclusive Economic Zone (EEZ):**

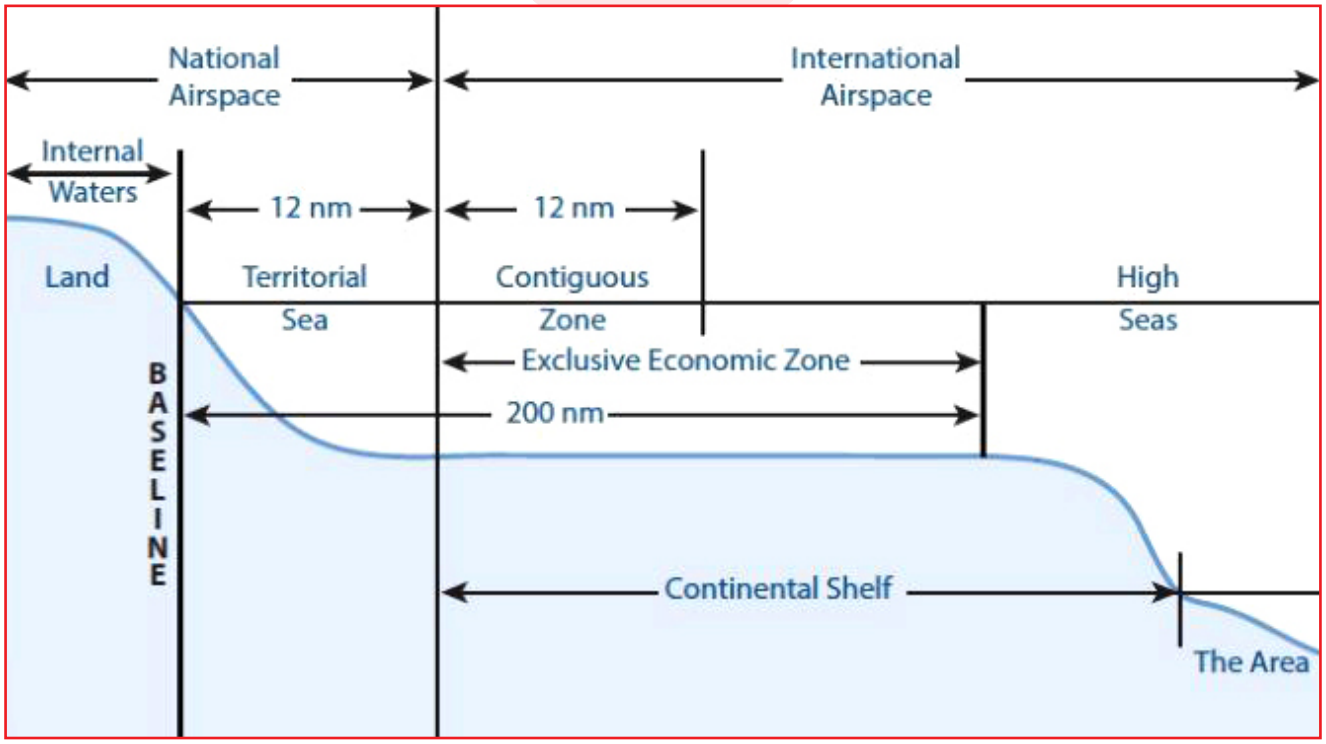
- Each coastal State may claim an EEZ beyond and adjacent to its territorial sea that extends seaward **up to 200 nm from its baselines.**
- Within its EEZ, **a coastal state has:**
  - Sovereign **rights to explore, exploit, conserve and manage natural resources**, whether living or nonliving, of the seabed and subsoil.
  - Rights to carry out activities like the production of energy from the water, currents and wind.
- Unlike the territorial sea and the contiguous zone, the EEZ only allows for the above-mentioned resource rights. It **does not give a coastal state the right to prohibit or limit freedom of navigation or overflight**, subject to very limited exceptions.

➢ **Continental Self:**

- A continental shelf is the **edge of a continent that lies under the ocean.** A continental shelf extends from the coastline of a continent to a **drop-off point** called the **shelf break.**
  - From the break, the shelf descends toward the **deep ocean floor** in what is called the **continental slope.**

➢ **High Seas:**

- The ocean surface and the water column beyond the EEZ are referred to as the high seas.
- It is **considered as "the common heritage of all mankind"** and is beyond any national jurisdiction.
- States can conduct activities in these areas as long as they are for peaceful purposes, such as transit, marine science, and undersea exploration.



Note:

What are the Continental Shelf Claims and Exploration Rights?

- **Exclusive Rights to Continental Shelf:** Countries possess exclusive rights up to 200 nautical miles from their borders, including the underlying seabed. This jurisdiction extends to the exploration and potential exploitation of resources within this zone.
- **Continental Shelf Extension:** Some ocean-bound states may have a natural land formation connecting their border to the edge of the deep ocean, extending beyond the 200-nautical-mile limit. This extension is known as the continental shelf.
- **Special Provisions:** There is a provision allowing countries along the **Bay of Bengal** to apply a different set of criteria for making claims on the extent of their continental shelf.
  - **Example:** Utilising a special provision, Sri Lanka has asserted a claim for an extension of its continental shelf up to **500 nautical miles,** exceeding the usual limit of **350 nautical miles.**
- **Rational Support to Claim:** To claim exclusive rights to the continental shelf beyond 200 nautical miles, a country must **provide a detailed scientific rationale supported by underwater maps and surveys.** This information is submitted to a scientific commission appointed by the **International Seabed Authority (ISBA).**
  - If the claim is approved by the commission, the country gains primacy to explore and potentially exploit both living and non-living resources within the extended continental shelf.

What is the Significance of Deep Sea Mining?

- **Resource Accessibility:** Deep sea mining provides access to valuable resources that are becoming increasingly scarce on land. These resources include **polymetallic nodules, polymetallic sulphides,** and **cobalt-rich ferromanganese crusts,** which contain high concentrations of minerals such as **copper, nickel, cobalt,** and **rare earth elements.**
  - As terrestrial deposits become depleted, deep-sea mining offers an alternative source of these critical materials.
- **Technological Advancements:** Developing technologies for deep-sea mining presents opportunities for innovation and technological advancement. This includes the design of specialised equipment capable of operating in **extreme oceanic conditions,** such as **high pressure, darkness,** and **low temperatures.**
  - Advancements in **robotics, remotely operated vehicles (ROVs),** and **autonomous underwater vehicles (AUVs)** are essential for efficient and safe mining operations.
- **Economic Potential:** Deep sea mining has the potential to generate significant economic benefits for participating countries and companies.
  - The extraction of valuable minerals from the ocean floor can stimulate **economic growth, create employment opportunities,** and contribute to national revenue through taxes, royalties, and resource-sharing agreements.

What are the Concerns Related to Deep Sea Mining?

- **Damage to Marine Ecosystem:** Deep Sea Mining can damage the **Marine Ecosystem** and **ecosystems.** Damage from mining can include **noise, vibration and light pollution,** as well as possible **leaks** and **spills of fuels** and other chemicals used in the **mining process**.
  - It could severely harm marine biodiversity and ecosystems,
- **Sediment Plumes Formation:** It will stir up **fine sediments** on the **seafloor,** creating **plumes of suspended particles.** Once valuable materials are extracted, slurry sediment plumes are sometimes pumped back into the sea.
  - That can harm **filter-feeding species** like **corals and sponges** and could smother or otherwise interfere with some creatures.
- **Wider Impact on Marine Population:** Deep-sea mining would go beyond harming the seabed and have a wider impact on **fish populations, marine mammals** and the essential function of the **deep-sea ecosystems** in regulating the climate.
- **Digging & Gauging:** The **digging** and **gauging** of the ocean floor by machines can alter or destroy **deep-sea habitats** and can harm yet unknown species of greater depth at sea.

Note:

United Nations Convention on the Law of the Sea 1982

- **About:**
  - The UNCLOS is an **international treaty** that provides a **regulatory framework for the use of the world's seas and oceans**.
  - It lays down a **comprehensive regime of law and order** in the world's oceans and seas establishing rules governing all uses of the oceans and their resources.
  - It enshrines the notion that **all problems of ocean space are closely** interrelated and need to be addressed as a whole.
- **Ratification:**
  - The Convention was **opened for signature in December 1982** in Montego Bay, Jamaica.
  - The convention has been **ratified by 168 parties**, which includes 167 states (164 United Nations (UN) member states plus the UN Observer state Palestine, as well as the Cook Islands and Niue) and the European Union. An additional 14 UN member states have signed, but not ratified the convention.
  - While **India ratified UN Law of the Seas in 1995,** the **US has failed to do it so far**.
- **Indian Law:**
  - As per India's **Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976**:
    - All foreign ships (other than warships including submarines and other underwater vehicles) shall enjoy the **right of innocent passage** through the territorial waters.
      - **Innocent passage:** It is the passage that is not prejudicial to the peace, good order or security of India.

What are other Blue Economy Initiatives?

- India-Norway Task Force on Blue Economy for Sustainable Development:
- Sagarmala project
- O-SMART
- Integrated Coastal Zone Management
- National Fisheries policy

Integrated River Basin Management

Why in News?

A recent report authored by the Kathmandu-based International Centre for Integrated Mountain Development (ICIMOD) and the Australian Water Partnership has emphasized the **need for multilateral treaties for effective integrated river basin management of the Indus, Ganga, and Brahmaputra rivers.**

What are the Key Highlights of the Report?

- **Integrated River Basin Management:**
  - The report emphasizes the importance of **integrated river basin management,** which involves a basin-wide approach to river planning, backed by quality data sharing on water availability, biodiversity, and pollution among all stakeholders.
- **Need for Multilateral Treaties:**
  - Despite **existing bilateral treaties and agreements on water data sharing,** there is a **notable absence of multilateral agreements** for river management in the region, posing a challenge to effective governance.
    - It emphasizes the necessity for establishing multilateral treaties to manage the Indus, Ganga, and Brahmaputra rivers effectively.
- **Dependence on Critical Rivers:**
  - Millions of people in India, Tibet (China), Pakistan, Afghanistan, Nepal, and Bhutan rely on the Indus, Ganga, and Brahmaputra rivers for **food and water security,** making comprehensive management strategies imperative.
    - All three basins are part of the larger **Indus-Ganga-Brahmaputra (IGB)** Plain, a vast alluvial plain that spans across parts of India, Pakistan, Bangladesh, and Nepal.

Note:

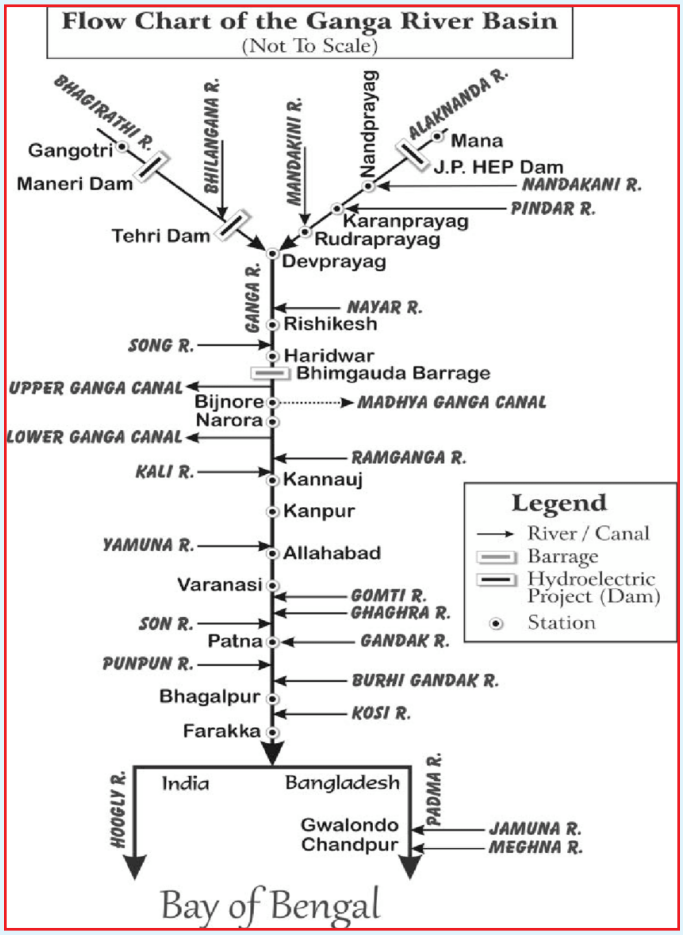
- **Ganga River Basin:**
  - 600 million Indians, 29 million Nepalese, and millions in Bangladesh live in this basin area.
  - No agreement involving Nepal, India, and Bangladesh.
- **Indus River Basin:**
  - Lifeline for 268 million people living in its basin.
- **Brahmaputra River Basin:**
  - Approximately 114 million people depend on it for water, electricity, food, agriculture, and fishing.

- **Recommendations:**
  - Recognising and **leveraging the knowledge of local communities** for effective crisis management.
    - Empowering local communities with **resources and technology** to enhance their resilience.
  - Addressing **data gaps related to water availability, biodiversity, and pollution** in the river basins for better management and early warning systems.
  - Adopting a holistic **'whole basin' research** approach that facilitates data-sharing, strategic planning, understanding climate change impacts, and ensuring reliable water supply.
  - Promoting **'hydro-solidarity' and climate diplomacy** among researchers from different countries to build trust and foster dialogue on transboundary water issues.
    - **'Hydro-solidarity'** is about promoting cooperation and solidarity among nations in **managing shared water resources**. It involves recognising the **interdependence of countries regarding water resources** and the need for collective action to address water-related challenges.
      - This includes implementing fair water-sharing agreements, promoting collaborative governance, investing in water infrastructure, and addressing the water-energy-food nexus.
    - Climate diplomacy plays a crucial role in **addressing** water stress caused by **climate change**, and integrating water diplomacy with climate diplomacy can help tackle the interconnected challenges of water scarcity and climate change.

What are the Key Facts About the Ganga, Indus and Brahmaputra River Basin?

- **Ganga River Basin:**
  - **Source and Headwaters:**
    - The Ganga originates as **Bhagirathi from Gangotri Glacier, Uttarakhand** at an elevation of 3, 892 m.
    - Many small streams comprise the headwaters of Ganga. The important among these are **Alaknanda, Dhauliganga, Pindar, Mandakini and Bhilangana.**
      - At Devprayag, where **Alaknanda joins Bhagirathi,** the river acquires the name **Ganga.** It traverses 2525 km before flowing into the Bay of Bengal.
  - **Course and Major Tributaries**
    - Flows through the states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal in India, before entering Bangladesh.
    - Nearly 80% of the Ganges river basin is in India, the rest is in Nepal, Tibet (China) and Bangladesh.
    - Major tributaries include the **Yamuna, Gomti, Ghagra, Gandak, and Kosi rivers.**
    - Known for its fertile alluvial plains, which have supported agriculture and human settlements for centuries.
  - **Delta and Outflow**
    - After a journey of around 2,510 kilometres, the Ganga River merges with the **Brahmaputra River in Bangladesh, forming the Padma River.**
      - The Padma River then joins the Meghna River and flows into the **Bay of Bengal** through the **Meghna Estuary.**

Note:



- **Indus River Basin:**
  - **Source:**
    - The Indus (Tibetan-Sengge Chu, 'Lion River'), a major river in South Asia, originates in **Tibet near Mansarovar Lake in the Trans-Himalaya**.
    - The river flows through **Tibet, India and Pakistan** and about 200 million people live in the area of its drainage basin.
    - The **Indus Waters Treaty is a treaty between India and Pakistan** that was signed in 1960, to define the rights and responsibilities of each country regarding the use of the **Indus River system's waters.** The treaty was brokered by the **World Bank.**
  - **Course and Major Tributaries:**
    - It enters **India through Ladakh** and flows through Jammu and Kashmir before reaching **Pakistan's Gilgit-Baltistan region.**
    - The major left-bank tributaries of the Indus River are the Zaskar, Suru, Soan, Jhelum, Chenab, Ravi, Beas, Satluj, and Panjnad rivers. The major right-bank tributaries are Shyok, Gilgit, Hunza, Swat, Kunnar, Kurram, Gomal, and Kabul rivers.
    - The Indus River and its tributaries are vital for agriculture and water supply in the region, particularly in Pakistan, where it serves as the lifeline for the country's economy.
  - **Delta and Outflow:**
    - The Indus River empties into the **Arabian Sea** near the city of Karachi in southern Pakistan.
      - Forms a vast delta known as the **Indus Delta**.
    - The delta is home to numerous creeks, marshes, and mangrove forests.

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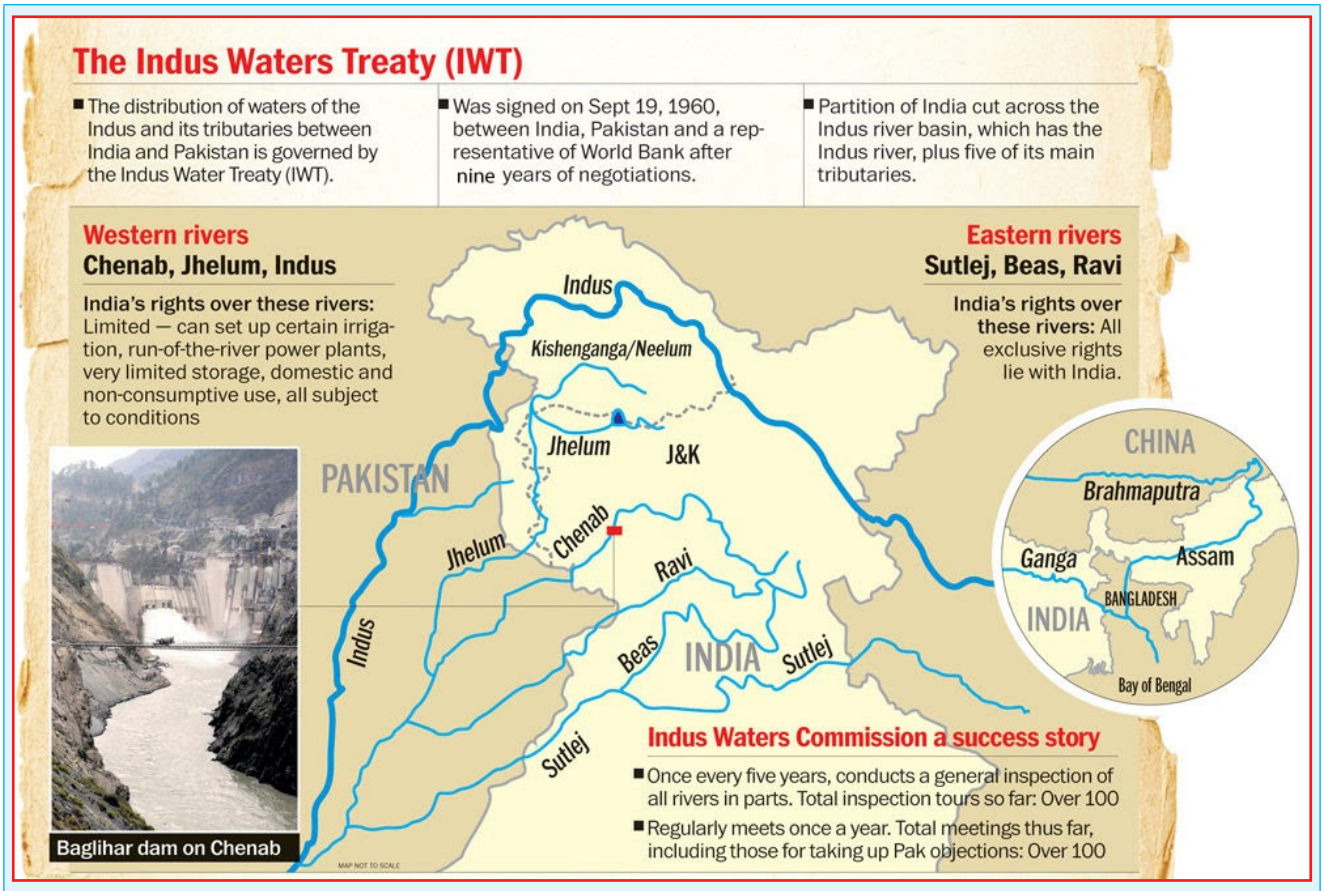
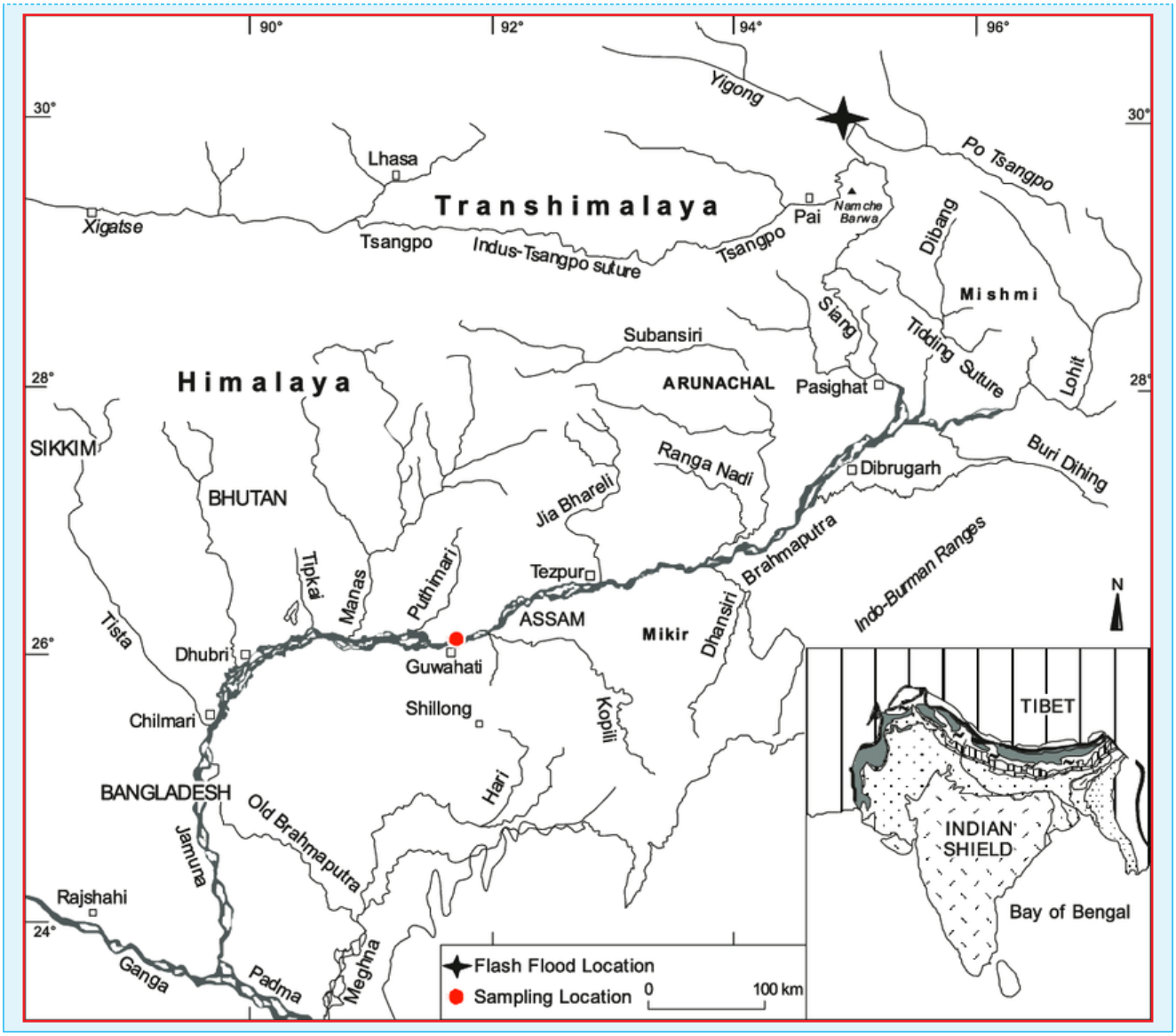


- **Brahmaputra River Basin:**
  - **Source:**
    - It originates under the name of **Siang or Dihang,** from the **Chemayungdung glacier of the Kailash range** near the Mansarovar Lake, the Brahmaputra ranks fifth in the world in terms of average discharge.
    - The basin covers an area of around 580,000 square kilometers spanning parts of Tibet (China), India, Bhutan, and Bangladesh.
    - The Brahmaputra River and its tributaries are important for agriculture, **hydropower generation,** and transportation in the region.
  - **Course and Major Tributaries:**
    - Known as the **Yarlung Tsangpo in Tibet,** flows eastward through the Himalayas and enters the Indian state of Arunachal Pradesh.
    - Continues its journey through the states of Assam and West Bengal in India, before entering Bangladesh.
    - Major tributaries include the Subansiri, Kameng, Manas, and Dhansiri rivers in India, and the **Teesta River** in Bangladesh.
  - **Delta and Outflow:**
    - The Brahmaputra River joins the Ganga River in Bangladesh, forming the **Padma River.**
      - The **Padma River then merges with the Meghna River** and flows into the Bay of Bengal through the **Meghna Estuary.**

Note:



Menace of Illegal Migration

Why in News?

Recently, the **International Organization for Migration (IOM)** has stated that a total of 8,565 **migrants** died on land and sea routes worldwide in 2023.

- IOM reported that the number of migrant deaths in 2023 increased by almost **20%** compared to 2022.
- The "**Missing Migrants**" project by IOM, established in 2014, tracks these figures and was initiated after a surge in deaths in the Mediterranean and an influx of migrants on the Italian island of Lampedusa.

What is the International Organization for Migration?

- **About:**
  - The **International Organization for Migration** originated in 1951 as the Provisional Intergovernmental Committee for the Movement of Migrants from Europe (PICMME) after **World War II's** upheavals.
  - It underwent name changes from PICMME to the **Intergovernmental Committee for European Migration (ICEM)** in 1952, to the **Intergovernmental Committee for Migration (ICM)** in 1980, and finally to the **International Organisation for Migration** in 1989, reflecting its evolution into a migration agency.

Note:

- In 2016, IOM entered into an agreement with the United Nations, becoming a related organization.

- **Members**: It currently has 175 Member States and 8 states with Observer status.
  - **India** became an IOM Member State on 18th June 2008.
- **Crisis Management:** Throughout its history, IOM has responded to various crises such as Hungary in 1956, Czechoslovakia in 1968, Chile in 1973, Vietnamese Boat People in 1975, Kuwait in 1990, Kosovo and Timor in 1999, and the **Asian tsunami and Pakistan earthquake** of 2004/2005.

What is the Status of Migration Across the Globe?

- **About**: Migration refers to the movement of people from one place to another, typically involving a change in residence.
  - This movement can be within a country **(internal migration)** or between countries **(international migration).**
  - It can be temporary or permanent, depending on the individual's intentions and circumstances.
  - According to the International Organization for Migration, migrants currently **constitute 3.6% of the global population.**
- **Major Causes:**
  - **Economic Reasons:** People often migrate in search of **better job opportunities, higher wages, improved living standards,** and access to essential services such as education and healthcare.
  - **Conflict and War:** Armed conflicts, civil wars, and political instability can force people to flee their homes and seek refuge in safer areas or countries.
  - **Environmental Factors:** Natural disasters such as floods, droughts, hurricanes, earthquakes, and climate change-related impacts can displace populations, leading to migration.
  - **Social and Political Factors:** Discrimination, persecution, human rights violations, lack of freedom, and political oppression can compel individuals or communities to seek asylum or move to countries with more favourable conditions.
  - **Urbanization and Rural-Urban Migration:** Rural residents may move to urban areas in search of employment, education, healthcare, and improved living standards, **contributing to urbanization trends.**
- **Major Challenges Faced by Illegal Migrants:**
  - **Physical Risks and Dangers:** Illegal migrants (like those who opt for **donkey flight**) face numerous physical dangers throughout the journey, including treacherous terrains like the **Darién Gap, lack of clean water, wild animals,** and the **threat of violence from criminal gangs.**
    - This can lead to injuries, illnesses, or even death during the journey.
  - **Legal Status and Rights:** Undocumented migrants or those with irregular status often encounter legal hurdles, lack access to fundamental rights and services, and live under the constant threat of **deportation, detention, or exploitation.**
  - **Discrimination and Xenophobia:** Migrants may face discrimination, prejudice, and hostility based on their nationality, ethnicity, religion, language, or cultural background, leading to **social exclusion, marginalisation, and unequal treatment.**
  - **Trafficking and Exploitation**: Migrants, especially vulnerable groups such as **women, and children** are at risk of human trafficking, exploitation, abuse, and forced labour, particularly in informal or precarious work settings.

Note:

Donkey flight:

- Donkey flight is a term used to describe an illegal immigration technique employed by people seeking unauthorised entry into countries like the **United States, Canada, the United Kingdom, and Australia.**
  - According to the **US Customs and Border Protection (USCBP),** Indians are the 5th largest source of illegal migrants entering the US from the southwest border.
  - 96,917 Indians were caught illegally crossing borders into the US between **October 2022 and September 2023.**

Darién Gap:

- A **geographic region** in the **Isthmus of Darién or Isthmus of Panama** connecting the **American continents within Central America,** consisting of a large watershed, forest, and mountains in Panama's Darién Province and the northern portion of Colombia's Chocó Department.

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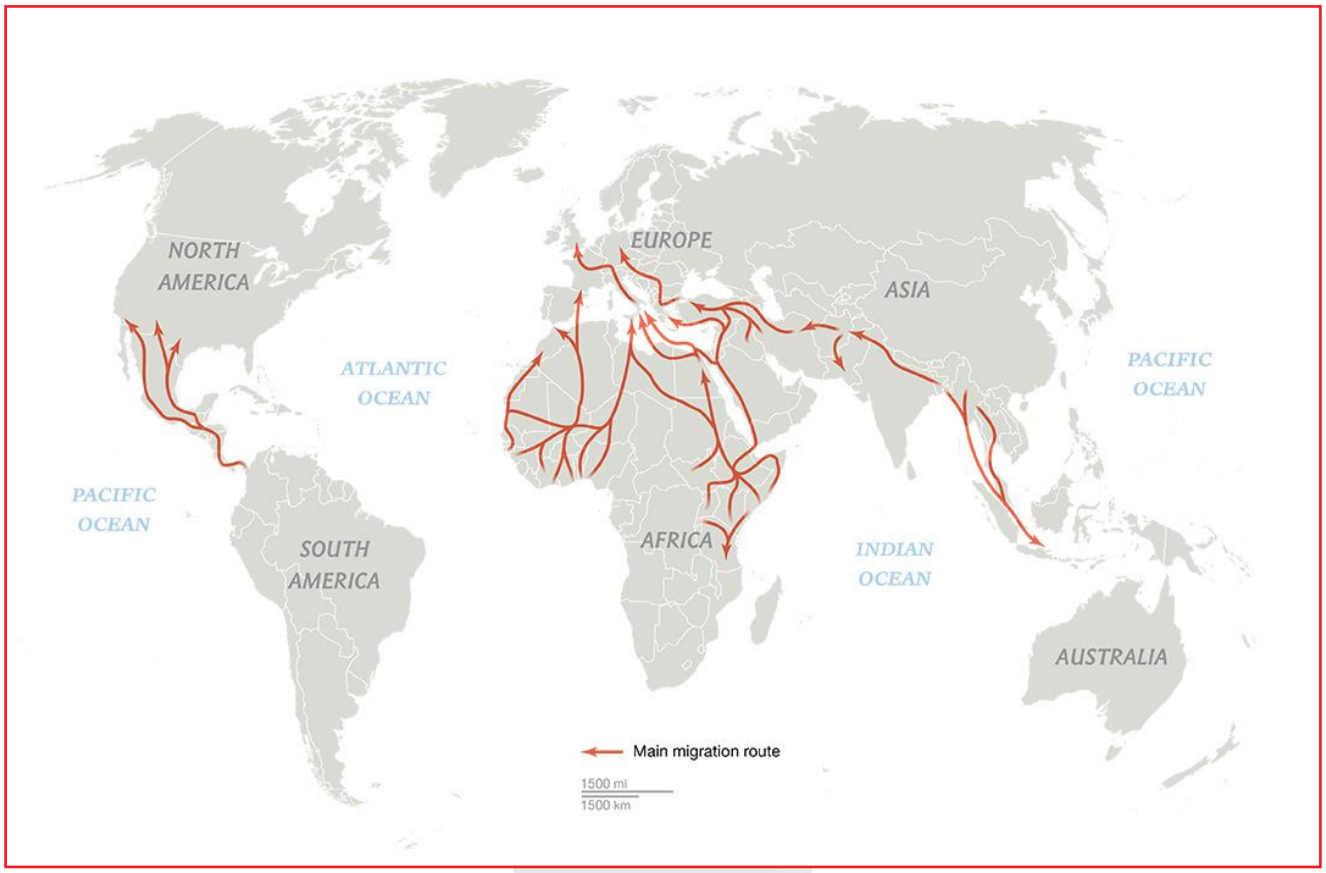


Black Sea

Why in News?

Russia appointed **Admiral Alexander Moiseev** as the new acting head of its Navy following a series of successful **Ukrainian attacks on Russia's Black Sea Fleet**, which has sustained significant losses.

What are the Key Facts About the Black Sea?

- **About:**
  - The Black Sea, also known as **the Euxine Sea**, is one of the major water bodies and a famous inland sea of the world.
  - This marginal sea of the Atlantic Ocean is located between Eastern Europe and Western Asia.
- **Geographical Location:**
  - **Land Boundary**: The Black Sea is bordered by Ukraine to the north and northwest, Russia and Georgia to the east, Türkiye to the south, and Bulgaria and Romania to the west.

Note: The bordering countries of the Black Sea can be remembered as **BURGeR-T:** Bulgaria, Ukraine, Russia, Georgia, Romania and Türkiye).

  - **Maritime Boundary**: It is linked to the **Sea of Marmara** through the **Bosphorus Strait** and then to the **Aegean Sea** (an elongated embayment of the Mediterranean Sea) through the **Dardanelles Strait.**
    - **The Turkish straits system** (the Dardanelles, Bosphorus and the Marmara Sea) forms **a transitional zone between the Mediterranean and the Black Sea.**
      - The Black Sea is also connected to the **Sea of Azov by the Strait of Kerch.**
  - **Surrounding Mountains:** The Black Sea is surrounded by the Pontic in the South, the Caucasus in the East, and the Crimean Mountains in the North.
- **Inflowing Rivers:**
  - The Black Sea is supplied by major rivers, principally the **Danube** (the second-longest river in Europe, after the Volga in Russia), **Dnieper and Dniester.**

Note:

Read more - Russia-Ukraine Conflict, Mediterranean Sea

■■■

Note:

Miscellaneous

Highlights

- *WHO launches CoViNet*
- *H5N1 Bird Flu*
- *Krishi Integrated Command and Control Centre*
- *Multimodal Transport Hub*

WHO launches CoViNet

Why in News?

The World Health Organization (WHO) has introduced a new initiative, Coronavirus **Network (CoViNet),** aimed at enhancing global surveillance and response capabilities against coronaviruses.

What is Coronavirus Network (CoViNet)?

- **About:**
  - CoViNet is designed to facilitate and **coordinate global expertise and capacities** for the early detection, monitoring, and assessment of various coronaviruses.
  - Beyond focusing solely on SARS-CoV-2, CoViNet will also assess other coronaviruses, including **Middle East respiratory syndrome coronavirus (MERS-CoV)** with a particular emphasis on enhancing laboratory capacity and surveillance.
    - MERS-CoV is a **zoonotic virus**(transmitted between animals and people). It has been identified and **linked to human infections in dromedary camels** in several Member States in the Middle East, Africa and South Asia.
  - The establishment of CoViNet builds upon the foundation laid by the **WHO Covid-19 reference laboratory network,** initially set up during the early stages of the pandemic in January 2020.
- **Significance of CoViNet:**
  - The network's establishment underscores the **persistent epidemic and pandemic risks** associated with coronaviruses and the necessity for proactive surveillance and response measures.
- **Key Features of CoViNet:**
  - CoViNet includes 36 labs from 21 countries across all six WHO regions, with **three Indian labs:** Council of Scientific and Industrial Research-National Environmental Engineering Research Institute, Indian Council of Medical Research-National Institute of Virology in Pune, and Translational Health Science and Technology Institute.
    - It emphasises a comprehensive One Health approach encompassing human, animal, and environmental health.
  - The network's objective is to equip WHO Member States with enhanced **capabilities for early detection, risk assessment, and response to coronavirus-related health challenges.**
- **Outcomes of CoViNet:**
  - CoViNet's efforts will provide vital data to inform **WHO policies and support decision-making,** particularly through Technical Advisory Groups on Viral Evolution and Vaccine Composition.

Similar WHO Initiative

- **Access to COVID-19 Tools (ACT) Accelerator**
  - The **Access to COVID-19 Tools (ACT) Accelerator** is a global collaboration launched by the WHO and partners in 2020.
  - It aims to accelerate the development, production, and equitable access to COVID-19 tests, treatments, and vaccines.
    - The initiative is organised into four pillars: diagnostics, therapeutics, vaccines, and the health systems and response connector, each vital to the overall effort.
- Zero-Draft of Pandemic Treaty

H5N1 Bird Flu

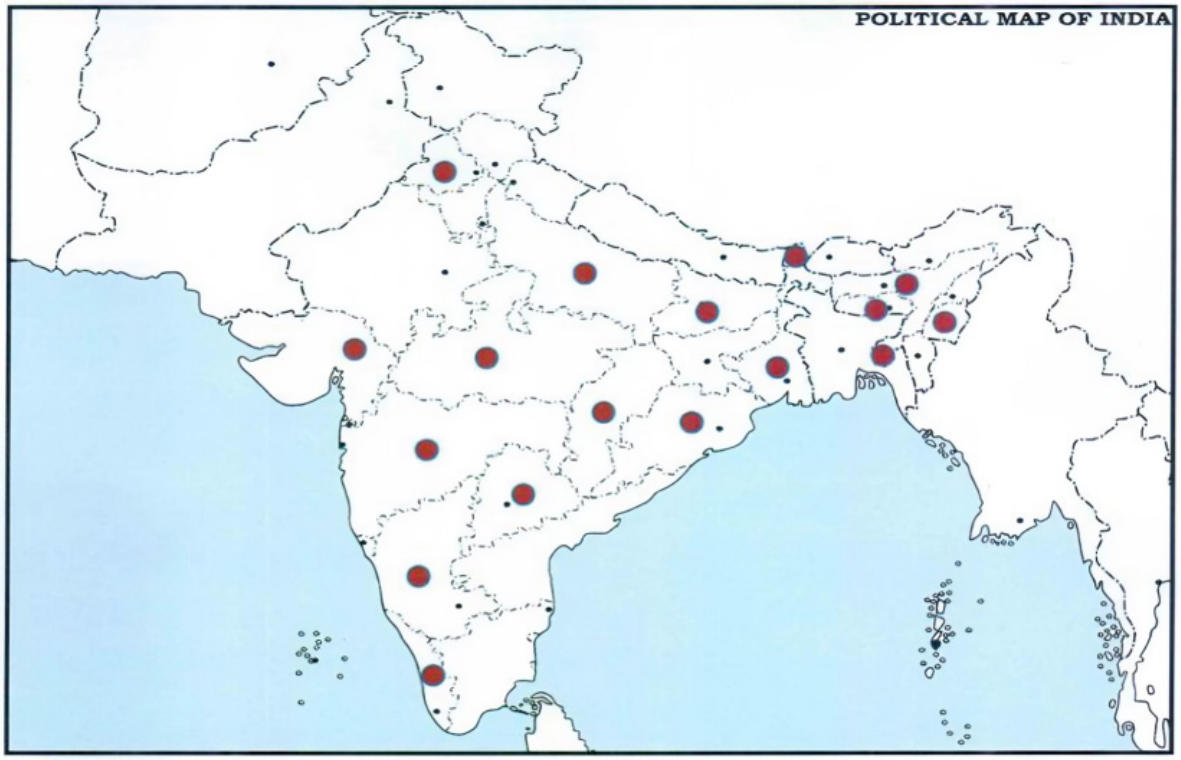
Why in News?

H5N1 bird flu, a highly pathogenic virus, has been spreading globally, posing a significant threat to birds and wildlife.

Note:

What is H5B1 Bird Flu?

- **Background:**
  - **Avian influenza A(H5N1) or H5B1 Bird Flu** is a highly pathogenic virus that primarily circulates among birds but can infect mammals.
  - H5N1 originated from a virus outbreak in **China** in 1996 and rapidly evolved into a highly pathogenic strain.
  - Since 2020, it has spread across **Europe, Africa, Asia, North America, South America, and even mainland Antarctica.**
  - India experienced the first H5N1 outbreak in the State of Maharashtra and Gujarat in 2015.
- **Impact on Animals:**
  - Wild birds, including endangered species like **California condors,** have been severely affected by H5N1.
  - The main species affected used to be chicken.
  - Marine mammals, such as **sea lions and dolphins,** have suffered mass deaths in regions like Chile and Peru.
  - Mammals like **foxes, pumas, bears in North America**, and farmed minks in Spain and Finland, have also been infected.

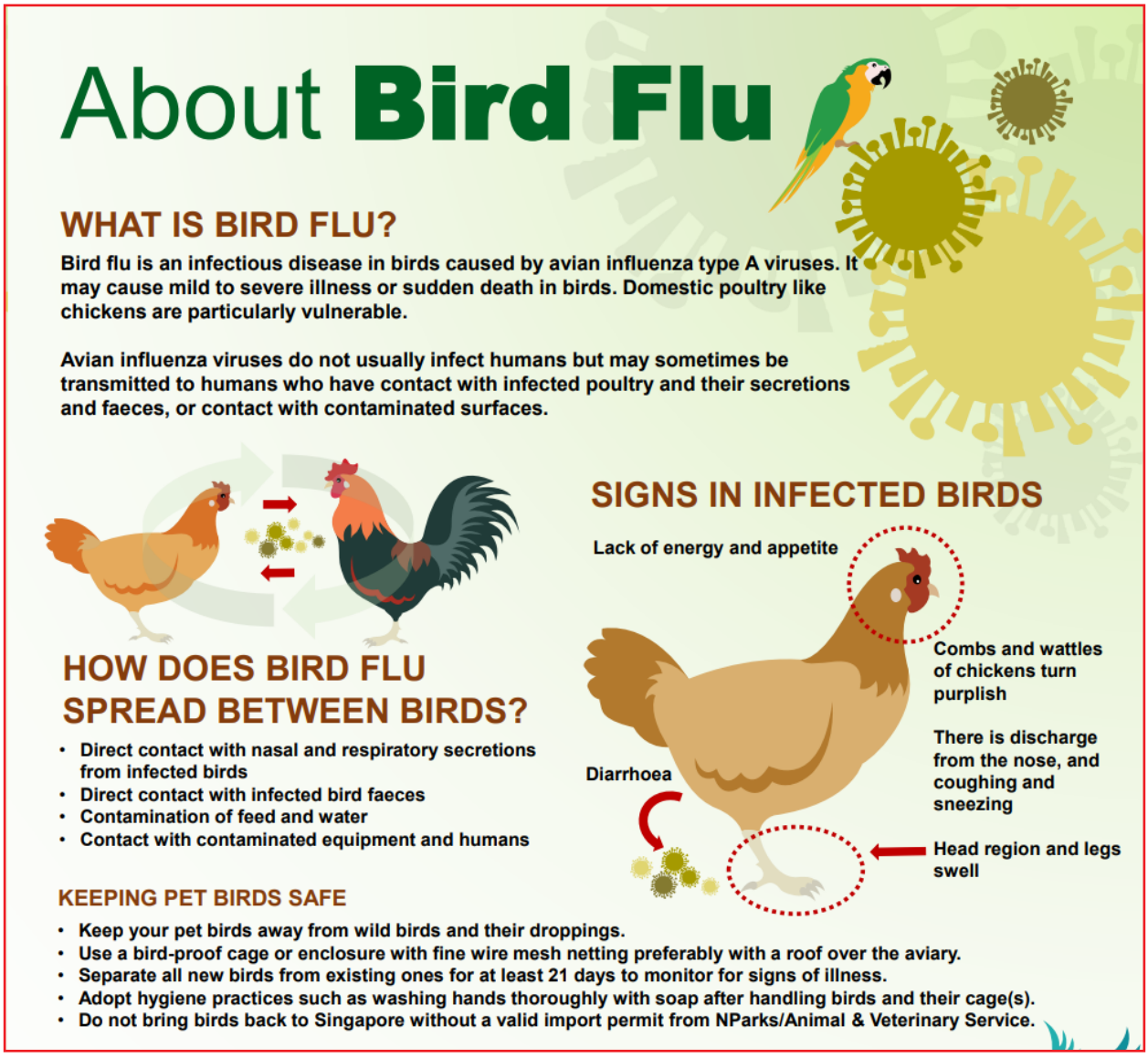


The map highlights the States where highly pathogenic avian influenza H5N1 outbreaks in poultry were reported (Feb 2006-April 2015).

- **Human Risk and Spread Factors:**
  - While rare, humans can contract bird flu, primarily through contact with infected birds.
  - Climate change may exacerbate the spread of the virus, altering bird behaviour and increasing interactions between bird species.
- **World Health Organization (WHO) Risk Assessment:**
  - While the virus does not easily infect humans, sporadic cases continue to occur, mainly linked to poultry exposure.
  - **Human-to-human transmission remains rare,** but the potential for further cases exists, particularly in regions where the **virus is endemic in poultry.**
  - WHO assesses the overall risk to the general population as low but emphasises the importance of surveillance and risk management.

Note:

- **Preventive Measures and Recommendations:**
  - WHO advises the public to avoid high-risk environments like live animal markets and practise good hand hygiene.
  - Prompt reporting of sick animals and avoiding consumption of sick poultry are recommended.
  - Individuals exposed to infected birds or environments should seek medical care promptly.



Krishi Integrated Command and Control Centre

Why in News?

The Union Agriculture Minister recently launched the **Krishi Integrated Command and Control Centre (ICCC)** at Krishi Bhavan in New Delhi, marking a major stride forward in the field of agricultural technology.

What is Krishi Integrated Command and Control Centre (ICCC)?

- **About:**
  - The Krishi ICCC is a state-of-the-art tech-based solution housed in the **Ministry of Agriculture & Farmers' Welfare,** designed to aid in making informed decisions using multiple IT applications and platforms such as weather data from the India Meteorological Department (IMD); sowing data

Note:

from **Digital Crop Survey**; farmer-and farm-related data from **Krishi Mapper (**an application for geo-fencing and geo-tagging of land); market intelligence information from the **Unified Portal for Agricultural Statistics (UPAg)**; and yield estimation data from the **General Crop Estimation Survey (GCES).**

- It leverages technologies such as **artificial intelligence, remote sensing, and Geographic Information Systems (GIS)** to collect and process granular agricultural data.
- The ICCC gives information on crop yields, production, drought situation, cropping patterns, relevant trends, outliers, and Key Performance Indicators (KPIs).
  - It also provides insights, alerts, and feedback on agriculture schemes, programs, projects, and initiatives.
- It includes map, timeline, and drill-down views, offering a comprehensive macro picture through the **Krishi Decision Support System (DSS).**
- This integrated visualisation facilitates quick and efficient decision-making and can be linked with the PM-Kisan chatbot in the future.

➢ **Practical Applications:**

- **Farmer's Advisory:**
  - The ICCC allows visualisation of GIS-based **soil carbon mapping** and **soil health card data,** enabling the generation of customised advisories for farmers regarding suitable crops and their water and fertiliser requirements.
- **Drought Actions:**
  - The ICCC correlates yield data with weather and rainfall information, facilitating proactive decision-making in response to changes in yield from specific regions.
- **Crop Diversification:**
  - Analysis of **crop diversification** maps and field variability for paddy assists in identifying regions with potential for diversified cropping, enabling tailored advice for farmers.
- **Farm Data Repository:**
  - The **Krishi Decision Support System (K-DSS)** acts as an agriculture data repository, supporting evidence-based decision-making and the preparation of customised advisories for farmers.
- **Validation of Yield:**
  - The ICCC validates yield data captured through Krishi MApper with data generated through the General Crop Estimation Survey (GCES) application for a plot, ensuring accuracy and reliability.

Multimodal Transport Hub

Why in News?

Indian Railways plans to develop a Multi-Modal Transport Hub (MMTH) in **Aspirational** cities with a population of more than **10 lakh across the country.**

➢ The programme is part of the infrastructure being developed for India's **'Viksit Bharat' initiative.**

What is a Multimodal Transport Hub?

➢ **About:**

- An MMTH is a transportation facility designed to **integrate various modes of transportation** such as rail, road, and mass transit systems in a single location.
- The primary objective of an MMTH is to **provide seamless connectivity and efficient transfer of passengers and goods** between different modes of transportation.

➢ **Key Features:**

- **Railway Station:** The railway station serves as a **terminus for train services connecting** different regions.
  - It is equipped with modern facilities for passengers including waiting areas, ticketing counters, platforms, and amenities.
- **Interstate Bus Terminus (ISBT):** The ISBT facilitates interstate and intrastate bus services, providing connectivity to various destinations.
- **Mass Rapid Transit System (MRTS) Station:** The MRTS station accommodates rapid transit services such as metro, light rail, or other forms of urban mass transit.
  - It connects the hub to the wider urban transit network and offers convenient transportation options for commuters.
- **Transportation Catchment Zone:** The surrounding area of the MMTH serves as a catchment zone, attracting travellers from nearby regions and facilitating improved transport connectivity for the surrounding areas.
  - This enhances accessibility and contributes to the economic development of the region.

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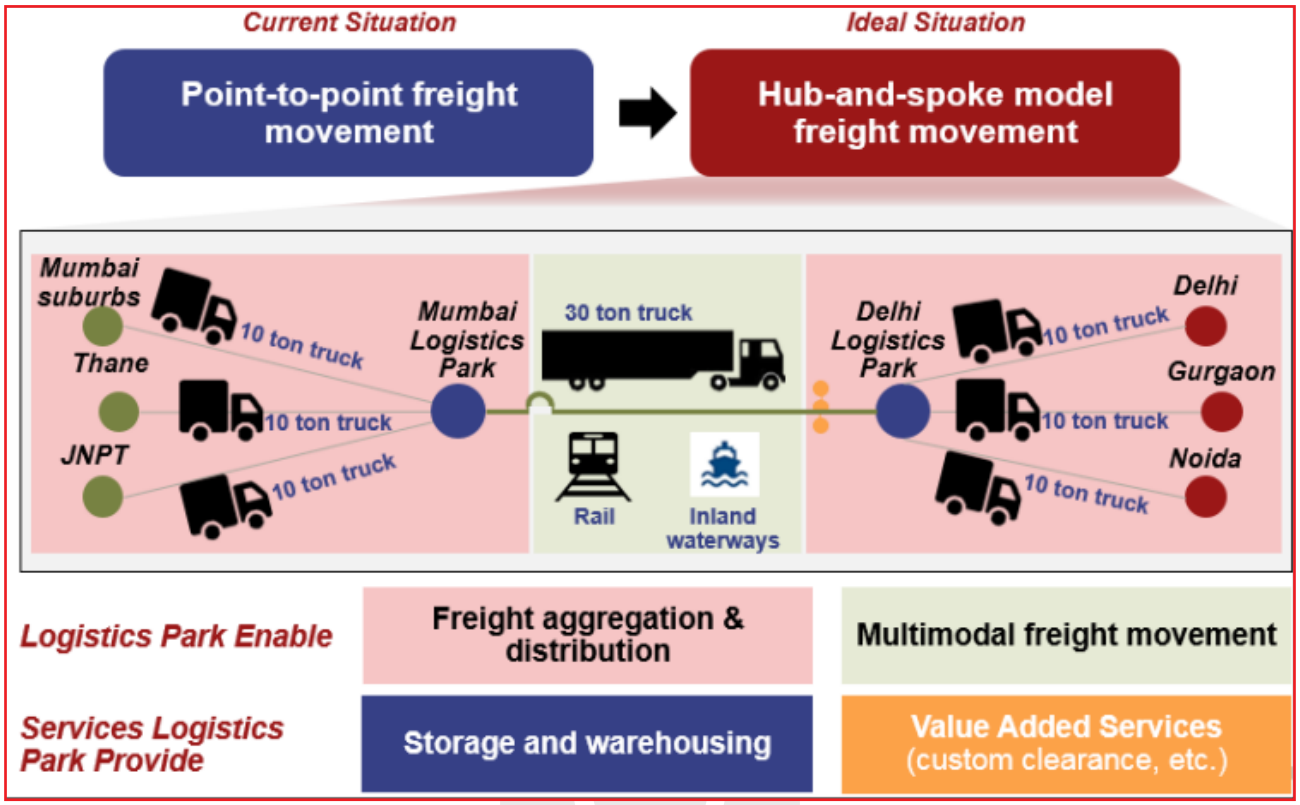


What are the Aspects of Viksit Bharat?

- **Structural transformation**: This refers to the shift of resources from **low-productivity sectors (such as agriculture) to high-productivity sectors** (such as manufacturing and services).
- **Organising Labour Markets:** This involves improving the **quality and quantity of labour supply, enhancing the skills and employability** of workers, and ensuring fair and efficient labour regulations.
- **Increasing Competitiveness:** This entails enhancing the **efficiency and innovation of firms**, improving the quality and diversity of products and services, and expanding the domestic and international markets..
- **Improving Financial and Social Inclusion:** This implies expanding the **access and affordability of financial services and social welfare schemes** for the **poor and marginalised groups.**
- **Governance Reforms:** This involves **strengthening the institutions** and processes of governance, such as the rule of law, **accountability, transparency,** and participation.
- **Seizing Opportunities in the Green Revolution:** This refers to **adopting and promoting green technologies** and practices, such as **renewable energy**, energy efficiency, and climate resilience.

What are the Government Initiatives for Railways and Transportation?

- **The Gati Shakti Terminal (GCT) policy**
- **National Logistics Policy (NLP)**
- **Sagarmala' and 'Bharatmala** for Investment in railway infrastructure
- **Dedicated Freight Corridors**

Note:

Rapid Fire Current Affairs

Highlights

UN General Assembly Adopts Landmark AI Resolution

The **UN General Assembly** has taken a historic step by adopting a landmark resolution focused on promoting the **safe, secure, and trustworthy use of artificial intelligence (AI) systems**, aligning with the goals of sustainable development.

- This adoption marks the first time the Assembly has addressed regulation in the rapidly evolving field of AI, signalling a significant milestone in global governance.
- The resolution recognises AI's potential to accelerate progress towards the **17 Sustainable Development Goals** and calls for cooperation among states, private sectors, civil society, and other stakeholders to develop regulatory frameworks and governance approaches for safe AI usage.
- Additionally, the Assembly stresses the importance of **bridging the digital divide by supporting developing countries** in gaining inclusive access to AI technologies and enhancing digital literacy, ensuring that technological advancement benefits everyone equally.
  - While **General Assembly resolutions are not legally binding,** they serve as a crucial indicator of global opinion.

Read more: Fostering Ethical AI

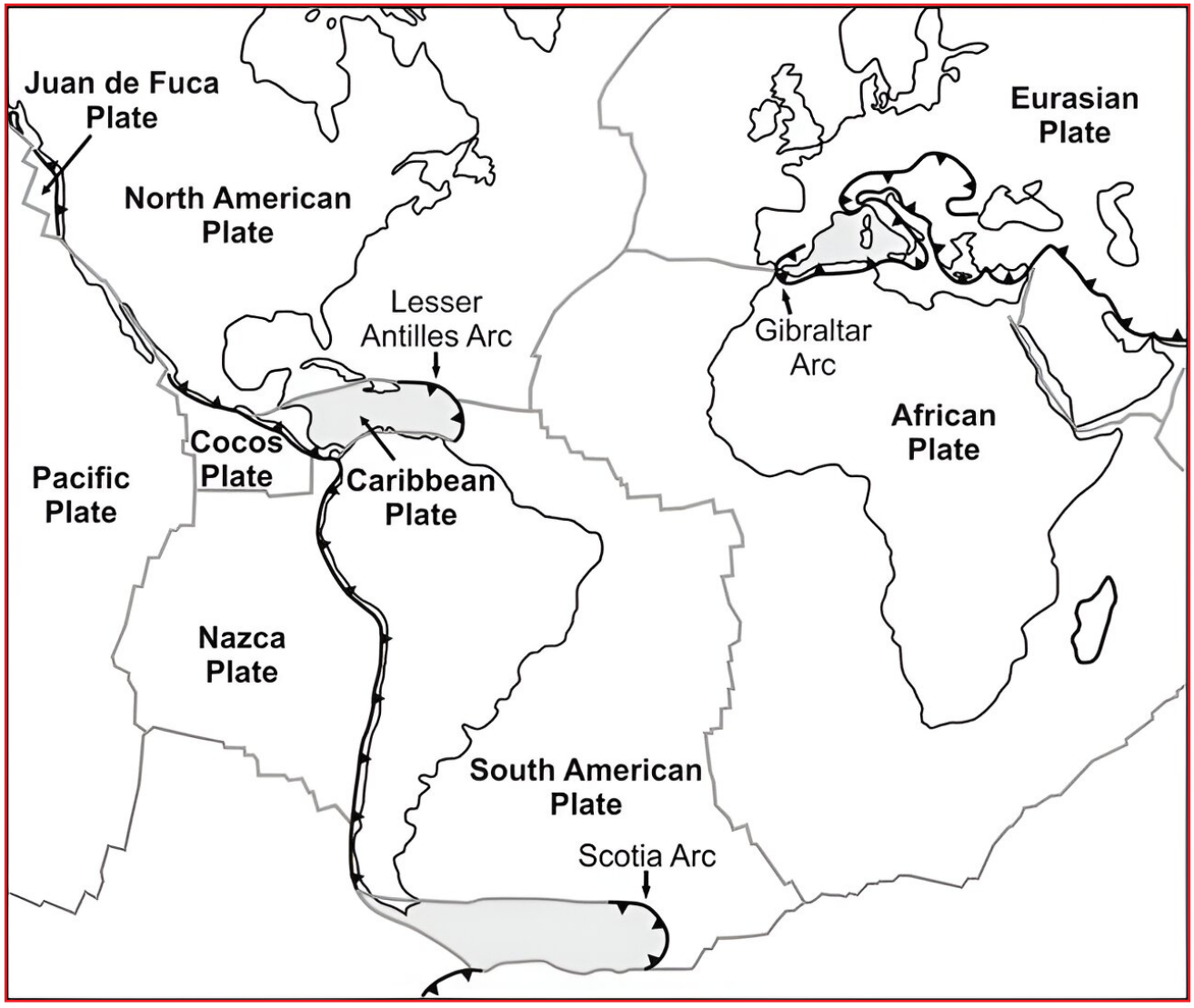
Concern Over Gibraltar Strait Subduction Zone

Recently, Scientists raised concerns about the future of the **Atlantic Ocean**. They have identified a **subduction**

Note:

zone beneath the Gibraltar Strait, situated between **Spain and Morocco.**

- It is a narrow gap separating **Europe** and **Africa.** It marks the meeting point of the Eurasian Plate and the African Plate.
- **The Ring of Fire:** Similar to the Pacific Ocean's Ring of Fire, where subduction zones encircle the **Pacific Ocean, the Atlantic Ocean** may witness the formation of a new subduction system.
- **Subduction Process:** Subduction zones occur where tectonic plates interact, with one plate diving below another. In this case, the **African Plate** is subducting beneath the **Eurasian Plate,** leading to seismic activity and earthquake risks.
  - Scientists predict that this subduction zone will expand westwards over the next 20 million years.
- **Ocean Basin Shrinking:** The subduction process could lead to the shrinking of the ocean basin, ultimately closing off the **Atlantic Ocean.**
- **Subduction Invasion:** Despite its current relatively small size (about 125 miles in length), projections suggest that the **subduction zone could expand to approximately 500 miles** within the next two decades.
  - This phenomenon is known as **"subduction invasion."**



Read More: Pacific Ring of Fire, Mid Oceanic Ridge, Seafloor Spreading, Tectonic Plates, Tectonic Evolution of Greater Maldive Ridge

Note:

Nimmu-Padam-Darcha Road in Ladakh

Recently, The **Border Roads Organisation (BRO)** has achieved a significant milestone by connecting the strategic **Nimmu-Padam-Darcha road** in **Ladakh.**

- This road serves as a **crucial link between Manali and Leh,** passing through **Darcha** and **Nimmu** along the **Kargil–Leh highway.**
- It now stands as the **third axis** connecting **Ladakh to the hinterland,** alongside the existing **Manali-Leh** and **Srinagar-Leh routes.**
- The road holds **strategic importance due to its shorter distance** compared to other routes. It will **provide all-weather connectivity** to the Ladakh region.
- It crosses only one pass i.e. **Shinkun La** at an elevation of **16,558 feet** where tunnel work is about to commence under the BRO's supervision.
- The road's completion will not only strengthen defence preparedness but also contribute to economic development in the **Zanskar Valley.**
- **BRO** was conceived and raised in **1960** by **Pandit Jawaharlal Nehru** to coordinate the speedy development of a network of roads in the **North** and the **North Eastern border regions** of the country.
  - It works under the administrative control of the **Ministry of Defence.**

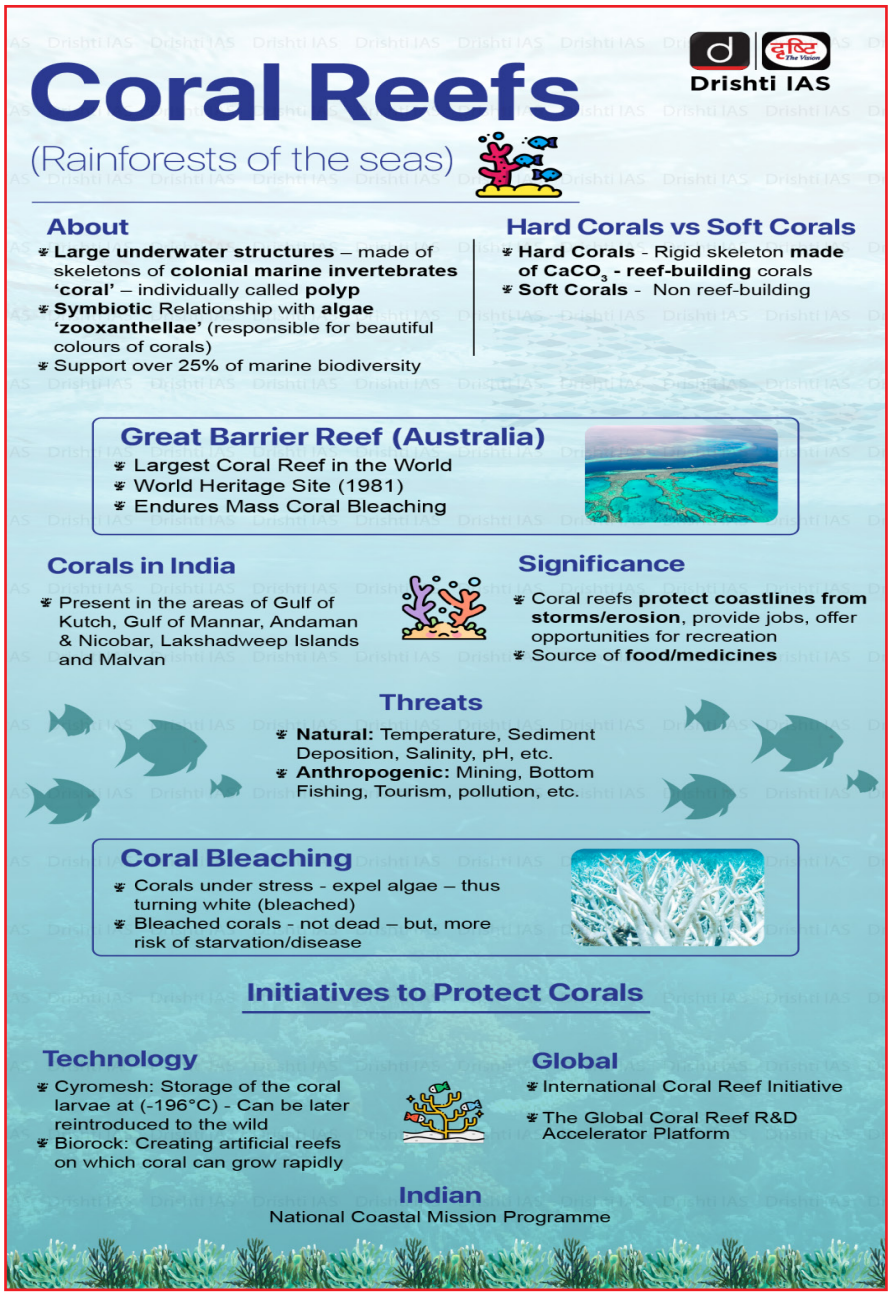
Read more: **Vibrant Villages Programme, BRO Opens Rohtang Pass, Zoji La, Importance of Ladakh**.

Note:

Reviving Coral Reefs with 'Good Sounds'

A study was presented that examined the **use of "healthy reef sounds" to potentially aid in the resettlement of coral polyps** and the **restoration of degraded reefs.**

- **Coral polyps use sound to communicate,** and the study found that **playing healthy reef sounds increased the settlement rate of coral polyps** on degraded reefs.
- The settlement rate was higher closer to the underwater speakers playing the sounds, indicating the impact of the sounds.
- **Climate change** due to the burning of fossil fuels and deforestation is **causing global warming** and rising sea levels, **leading to the destruction of coral reefs** through bleaching events.



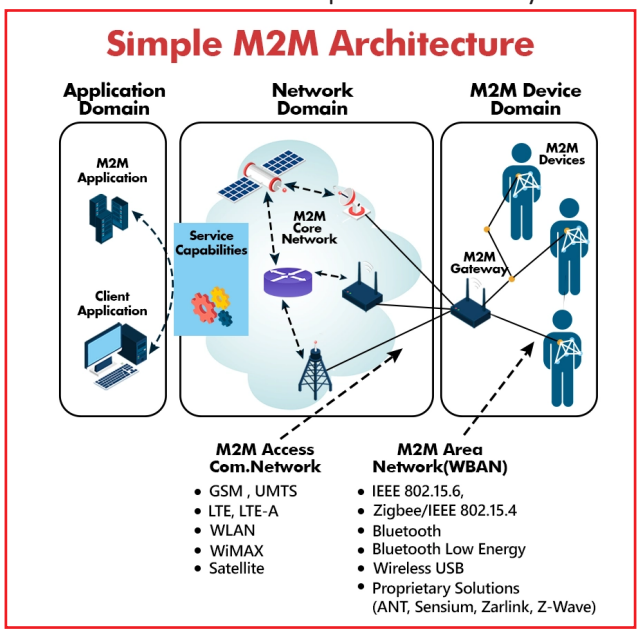
Read More- Coral Bleaching in Great Barrier Reef, Coral reefs

Note:

M2M Communication and eSim Technologies

The **Telecom Regulatory Authority of India (TRAI)** has released recommendations on the usage of **Embedded SIM (eSIM)** for **Machine-to-Machine (M2M) communications** to ensure security through **proper Know Your Customer (KYC) for network security,** fraud risk mitigation, and overall integrity of the M2M eSIM ecosystem.

- M2M, the next generation of Internet revolution, connects devices through **automated communication without human intervention.** Embedded sensors and communication modules **enable data transmission through wired and wireless networks.**
  - With the rollout of **5G services**, the M2M ecosystem's opportunities have expanded, offering increased scope for applications in sectors such as agriculture, transportation, healthcare, and industrial automation.
- **Understanding M2M Technology:**
  - It's a way for devices to exchange information directly, without needing a person in the loop. They can be simple things like sending alerts (like a smoke detector) or exchanging complex data (like factory machines).
    - For example, a smart thermostat might talk to a smart sprinkler system. If the thermostat detects it's a hot day, it can tell the sprinklers to turn on and keep the lawn healthy.



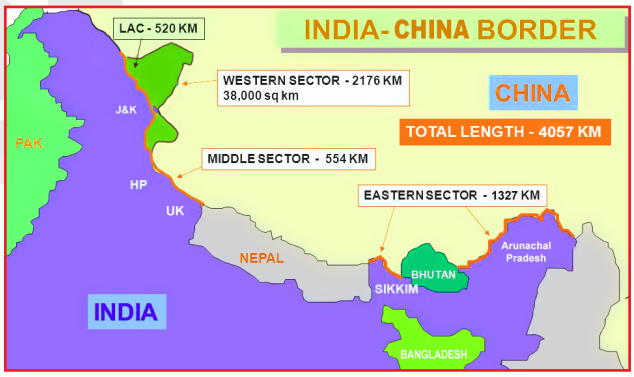
- An eSIM is a digital SIM card embedded directly into a device, eliminating the need for a physical SIM card. It's programmable remotely via inbuilt device software.

Read more: **eSIMs Technology**

India-China Border Affairs

Recently, Indian and Chinese diplomats convened for the 29th meeting of the **Working Mechanism for Consultation and Coordination (WMCC) on India-China Border Affairs** in Beijing, marking a significant development amid the **ongoing tensions along the Line of Actual Control.**

- Both sides agreed to maintain regular contact through diplomatic and military channels.
- They also agreed to promote the **transition of the border situation into a normalised phase of control and management.**
- The India-China Border is not fully demarcated, this has led to tensions between the countries.
- **The Line of Actual Control (LAC)** serves as the boundary separating Indian-controlled territory from Chinese-controlled territory.



Read more: **Rethinking India's Approach to China: Strategic Considerations**

India's Foreign Direct Investment Trends

The Finance Ministry has released a comprehensive review shedding light on **India's foreign direct investment (FDI)** landscape, revealing both declines and hopeful prospects.

- India's **net FDI inflows dropped by almost 31% to USD 25.5 billion** over the first ten months of 2023-24.
  - Overall global FDI flows rose by 3% to an estimated USD 1.4 trillion in 2023, but flows to developing countries **fell by 9% due to economic uncertainty and higher interest rates.**

Note:

- While a modest increase in global FDI flows is anticipated in 2024, significant risks remain, including **geopolitical tensions, high debt levels, and global economic uncertainties.**

- Around 65% of India's FDI equity inflows were observed in services, drugs and pharmaceuticals, construction (infrastructure activities), and non-conventional energy sectors.
  - The **Netherlands, Singapore, Japan, the USA, and Mauritius** accounted for approximately **70% of the total FDI equity inflows into India.**

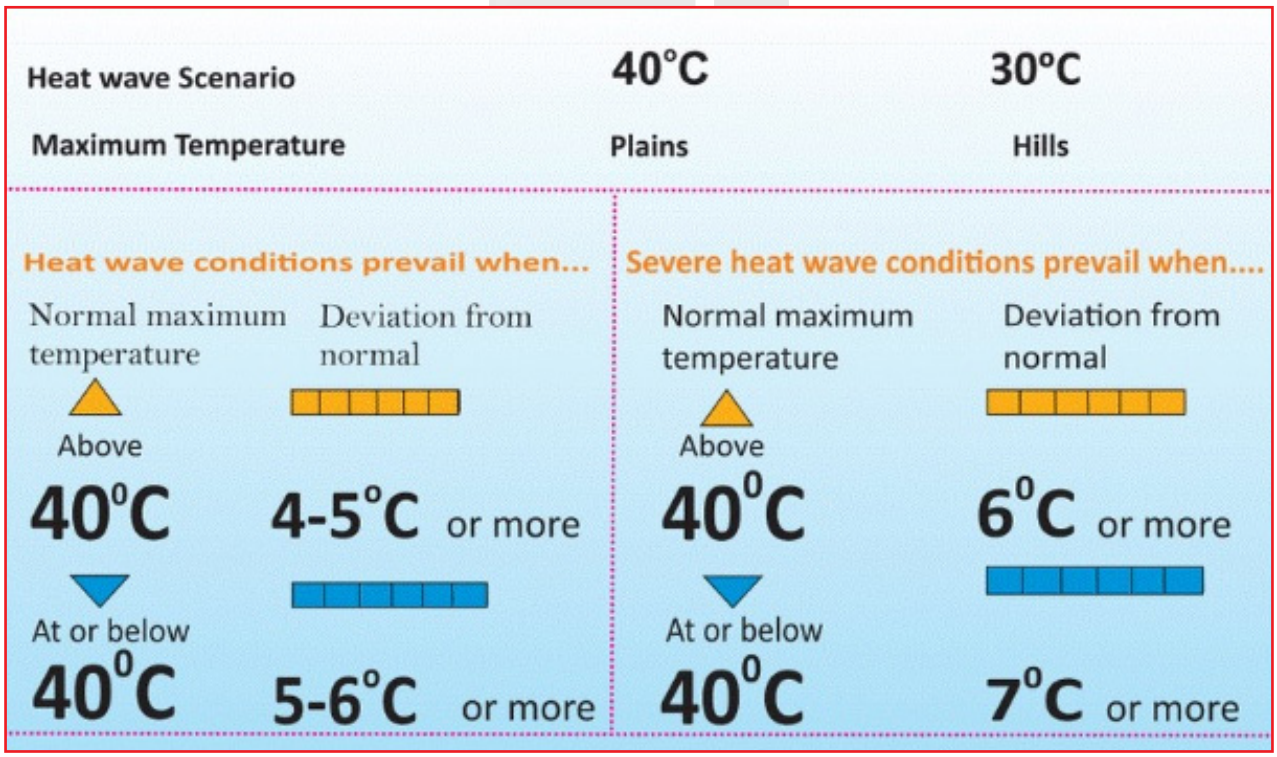
Read more: Foreign Direct Investment

Heat Wave Conditions in Coastal Regions of Kerala

Recently, the **Indian Meteorological Department (IMD)** issued an alert warning of heatwave for 40°C in Thrissur and 39°C in Kollam and Palakkad districts of Kerala.

- Heatwaves are prolonged periods of excessively hot weather that can cause adverse impacts on human health, the environment, and the economy.
  - India, being a tropical country, is particularly vulnerable to heat waves.

- **IMD Criteria for Declaring Heat Wave in India:**
  - Heat Wave is considered when the maximum temperature of a station reaches at least 40°C for Plains and at least 30°C for Hilly regions.
  - The criteria for the coastal station maximum temperature should be greater than or equal to 37°C.
  - If the normal maximum temperature of a station is less than or equal to 40°C, then an increase of 5°C to 6°C from the normal temperature is considered to be a heat wave condition.



Read More: Heat Waves and Heat Dome

Revised Wages under MGNREGS

The Union government recently announced revised wages under the **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS),** prompting varied responses from different states.

- Several states reported an increase in **wages ranging from 8% to 10%**. The Union Rural Development Ministry obtained special permission from the **Election Commission** for this routine annual exercise, considering the constraints imposed by the **model code of conduct.**

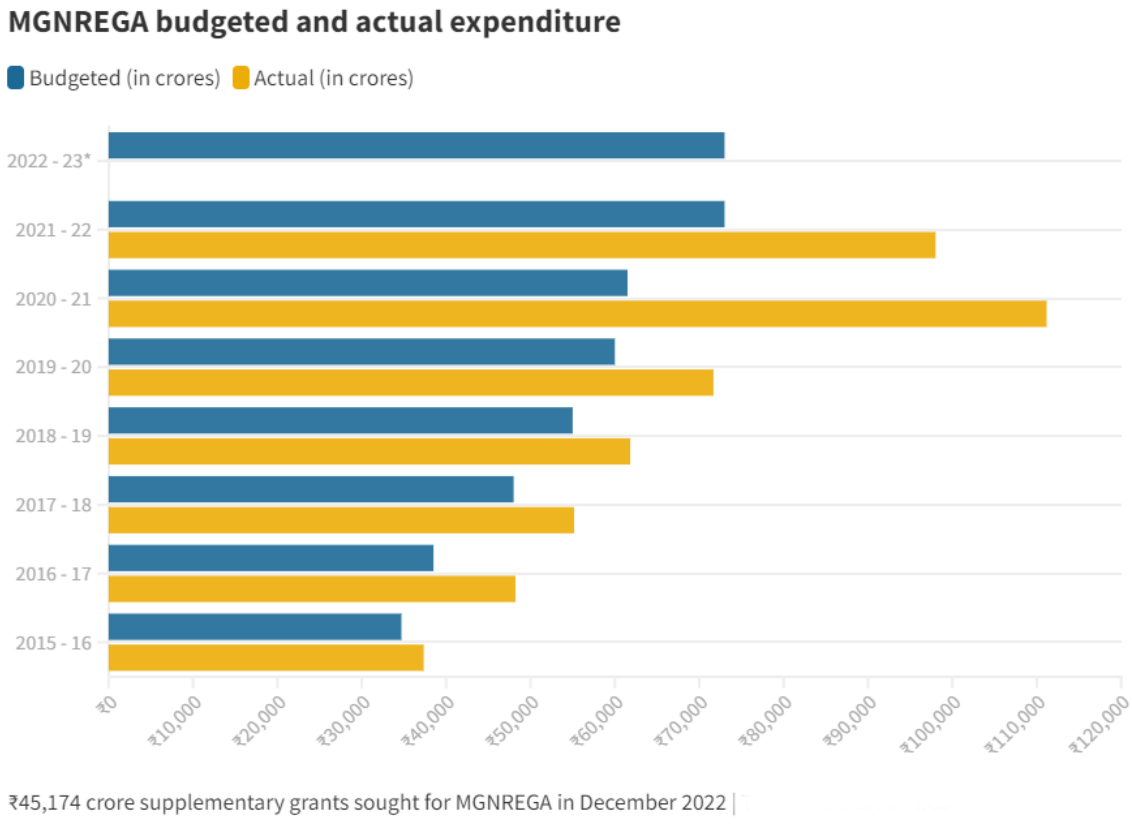
Note:

- Telangana, Andhra Pradesh, Chhattisgarh, Gujarat, Madhya Pradesh, Maharashtra, Tamil Nadu, and Goa recorded notable hikes ranging from 8% to 10.5%.

- **Haryana offers the highest wages at Rs 374 per day**, whereas **Uttar Pradesh has one of the lowest** at Rs 237.
  - The revised rates will come into effect from 1st April 2024.

- Despite the revision, the nation-wide average days of **employment provided per household in the financial year 2023-24 remained at 51 days,** falling short of the promised 100 days.
- Launched in 2005, **MGNREGA is one of the world's largest work guarantee programs,** initiated by the Ministry of Rural Development.

How has the Centre's allocation for MGNREGS changed over the years?



₹45,174 crore supplementary grants sought for MGNREGA in December 2022

Read more: Social Audit of MGNREGA Scheme

Statio Shiv Shakti as Name of the Chandrayaan-3 Landing Site

The **International Astronomical Union (IAU)** working group for Planetary System Nomenclature has approved the name **'Statio Shiv Shakti'** for the landing site of Chandrayaan-3's Vikram lander.

- **Significance of 'Statio Shiv Shakti':**
  - Earlier, the Prime Minister emphasised that the "Shiv Shakti" point on the moon signifies **a connection spanning from the Himalayas to Kanyakumari**.
  - **"Shiv"** symbolizes determination for the betterment of humanity.
  - **"Shakti"** represents the strength to achieve these resolutions.
- **Other Key Locations:**
  - Prime Minister previously designated the **location of Chandrayaan-2's lander** crash in September 2019 as **"Tiranga Point."**

Note:

- **Former President A.P.J. Abdul Kalam** proposed naming the site where the **Chandrayaan-1** moon impact probe landed in November 2008 as **"Jawahar Point."**

Read more: Chandrayaan-3 Successfully Lands on Moon's South Pole

Odisha's 'Drink from Tap' Mission

In 2017, the Odisha government launched its pioneering **'drink from tap' mission**, making it the **first and only state in India to ensure** drinking water quality **on household tap connections.**

- The initiative aimed to transform urban drinking water supply, **combat** waterborne diseases**, and relieve the financial strain**. It provides 24x7 access to high-quality drinking water directly from taps, cutting **costs and time, eliminating filtration or boiling needs**.
- Currently **covering 2.55 million people in eight cities,** the mission aims to reach **4.1 million people across urban Odisha** by the end of 2024.
- Real-time surveillance enforces **Indian Standard (IS) for drinking water,** maintaining permissible limits for soluble and insoluble components, ensuring safe consumption.
- Community engagement initiatives like the **'jal sathi' program** enlist women from **self-help groups** to facilitate service delivery and behavioural change.
- Third-party evaluation by the National Institute of Urban Affairs highlights the project's significance and potential for replication.

Read more: Compendium of Best Practices in Water Management – 3.0

Rising Cholesterol Among Young Population

Recent years trends show a significant rise in cholesterol levels among the younger populations.

Cholesterol:

- Cholesterol is a **waxy substance made by the liver.** It plays an important role in creating cells, and hormones, and in the **production of Vitamin D and bile acids**, which play a vital role in the **human digestive system.**
- **Types:** Cholesterol in our bloodstream is transported by lipoproteins known as High-density lipoprotein (HDL) and Low-density lipoprotein (LDL)**.**
  - **HDL cholesterol (Good Cholesterol)** absorbs cholesterol in the blood and carries it back to the liver. The liver then flushes it from the body. High levels of HDL cholesterol can lower the risk of heart disease and stroke.
  - **LDL cholesterol (bad cholesterol)** makes up most of the body's cholesterol. High LDL levels can raise the risk of heart disease and stroke.
    - It can build up in artery walls, leading to **plaque formation (atherosclerosis).**
    - This plaque buildup can **increase the risk of blood clots,** which may block arteries and **cause heart attacks or strokes**.
    - It can also reduce blood flow and oxygen to vital organs, potentially leading to **kidney disease or peripheral arterial disease.**

Read more: Alarming Rise of Non-Communicable Diseases in India

International Day of Forests

National Zoological Park, New Delhi, recently observed the **International Day of Forests on 21st March 2024,** under the theme **"Forests and innovation: new solutions for a better world."**

- The event aimed to raise awareness among visitors about the importance of forests and their role in our lives.
- The United Nations General Assembly proclaimed 21st March the International Day of Forests in 2012 to celebrate and raise awareness of the importance of all types of forests.
  - Countries are urged to conduct local, national, and international activities related to forests and trees, like tree planting campaigns.
- The United Nations Forum on Forests, the **Food and Agriculture Organization (FAO),** and other relevant organisations collaborate with governments to organise these efforts.
- As per the latest **India State of Forest Report (ISFR) 2021**, India's total forest and tree **cover was 80.9 million hectares,** which accounted for **24.62% of the geographical area of the country.**
  - **Madhya Pradesh had the largest forest cover**, followed by Arunachal Pradesh, Chhattisgarh, Odisha and Maharashtra.
- India's **National Forest Policy, 1988** aims for at **least 33% of the total geographical area to be under forest to maintain ecological stability.**

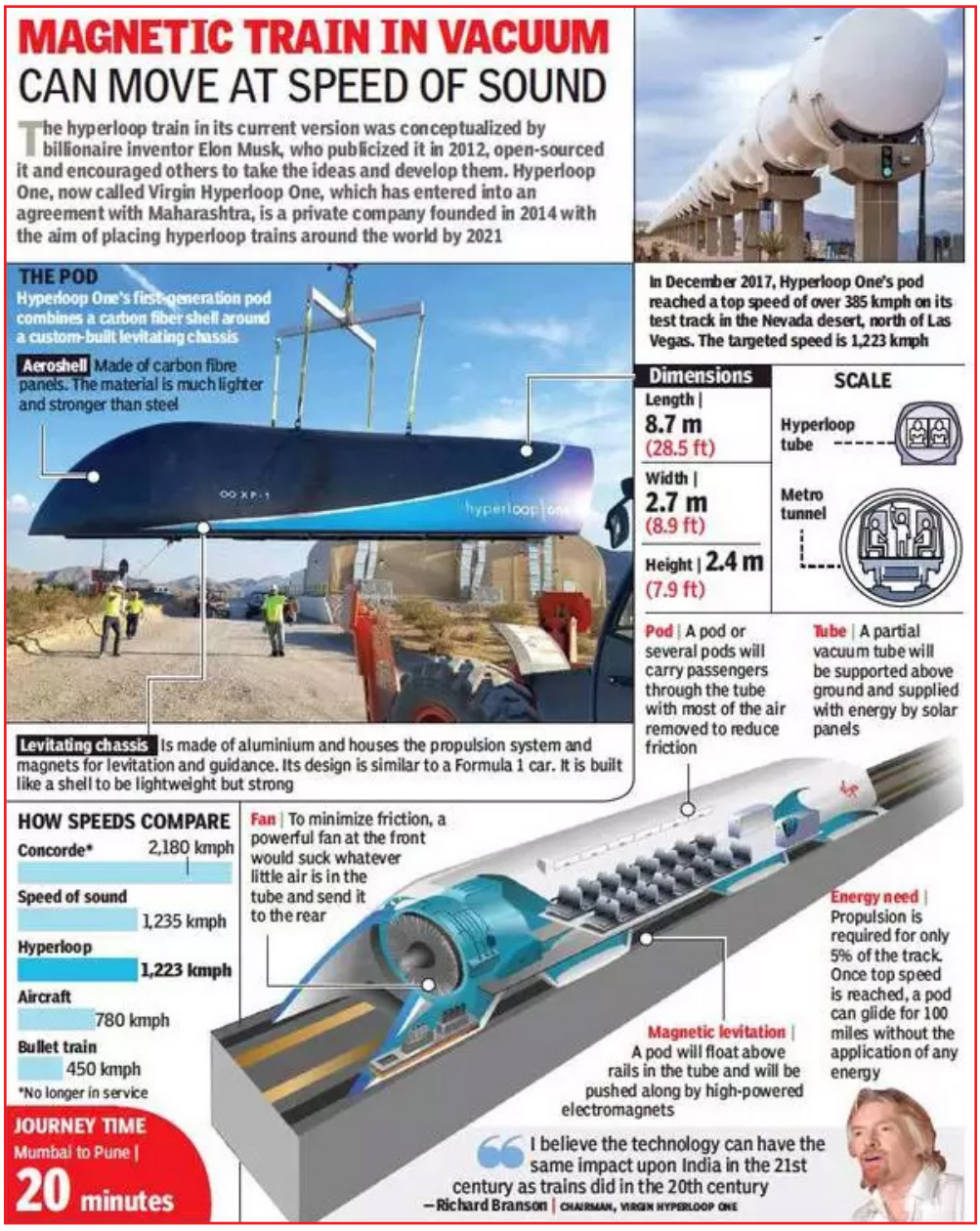
Read more: International Day of Forests

Note:

Hyperloop Technology

Recently, **hyperloop technology** was highlighted for its energy efficiency and sustainability.

- Hyperloop is a transportation concept developed by Elon Musk in 2013 that would use **pressurised tubes and capsules** to connect mobility hubs in large cities.
  - The capsules, called **pods,** would float at high speeds using contactless levitation and **electromagnetic propulsion systems**, along with low **aerodynamic drag**(the force which is faced by the vehicle as it moves through the air).
- Hyperloop would be a green way to travel that could reduce the need for driving or flying and could also free up traditional train lines.
- Hyperloop technology faces several challenges, including the **high cost of building and maintaining the infrastructure**, the technical complexity of maintaining a vacuum in the tubes, and the safety concerns associated with operating a high-speed transportation system.



Read more: Metro Neo

Note:

Ban on Asbestos in the United States

The **Environmental Protection Agency** of the United States recently announced a comprehensive ban on **asbestos, a carcinogen** that kills tens of thousands of Americans every year.

- Asbestos, which was once **common in home insulation and other products**, is banned in more than **50 countries**, and its use in the US has been declining for decades.
  - The only form of asbestos known to be currently imported, processed or distributed for use in the US is **chrysotile asbestos**, which is imported primarily from Brazil and Russia.
  - The substance is used to manufacture **chlorine bleach and sodium hydroxide, also known as caustic soda,** including some that are used for water purification.
- Exposure to asbestos poses severe health risks, including lung cancer, **asbestosis** (lung scarring), **mesothelioma** (a rare aggressive cancer), and pleural complications like thickening and fluid buildup.
  - **India banned the mining of asbestos in 2011,** but it still imports and uses asbestos in products like insulation, roofing sheets, and brake linings.

Read more: Mesothelioma

Nausena Bhawan

Recently, the Union Minister for Defence inaugurated **'Nausena Bhawan'**, the first Headquarter building of the **Indian Navy**, in New Delhi.

- Previously, the Navy operated from 13 different locations, necessitating a consolidated headquarters.
  - The major bases of the Indian Navy are located at **Mumbai, Goa, Karwar, Kochi, Chennai, Visakhapatnam, Kolkata and Port Blair.**
- The building has achieved **Green Rating IV** under the integrated habitability assessment.
- Every year, **Indian Navy Day** is celebrated on **4th December** to respect the Indian Navy's counter-attack in Operation Trident during the **Indo-Pakistan War 1971.**

Read more: Indian Navy Day 2023

Indian Navy Advances Atma Nirbhar Bharat with ASW SWC Project

Recently, the Indian Navy's shipbuilding program achieved a significant milestone with the launch of 'Agray' and 'Akshay', the 5th and 6th ships of the 08 x **ASW (Anti-Submarine Warfare) Shallow Water Craft (SWC)** Project.

- These ships are being built by M/S Garden Reach Shipbuilders & Engineers (GRSE) in Kolkata for the Indian Navy.
- These ships signify a transition from the aging **Abhay Class Corvettes** to the more advanced **Arnala Class**, designed for anti-submarine and mine laying operations in coastal waters.
- The project reflects India's commitment to bolstering indigenous defense manufacturing, with over **80% of the content sourced domestically**.
- Notably, in the past year, **3 indigenous warships/ submarines** have been delivered, with a total of 9 warships launched, underlining the nation's determination to strengthen its maritime capabilities through self-sufficiency.

Read more: Indigenisation of Defence

World Young Rheumatic Disease Day

World Young Rheumatic Disease Day (WORD Day) (18th March) underscores the importance of early detection and awareness regarding **rheumatic diseases** among young individuals.

- Rheumatic disease is an umbrella term that refers to **arthritis** and several other conditions that affect the joints, tendons, muscles, ligaments, bones, and muscles

Note:

- The most prevalent paediatric rheumatic disorder, **Juvenile Idiopathic Arthritis (JIA)** encompasses various inflammatory arthritis subtypes, posing a significant health challenge among children worldwide.

- JIA's global prevalence ranges from **0.07 to 4 per 1,000 children,** with varying distribution patterns across different regions.
  - Children with JIA commonly experience joint pain, swelling, and functional limitations, particularly noticeable in the morning or after periods of rest.
  - JIA can affect different joints, causing diverse functional limitations such as impaired mobility and difficulty with activities like writing and eating, depending on the subtype.
- Therapeutic options for JIA include steroids, **disease-modifying antirheumatic drugs (DMARDs**), and newer biologic drugs, aimed at modulating the immune system and managing symptoms.
- Challenges include **limited awareness and delayed diagnosis,** highlighting the need for enhanced community awareness and streamlined referral mechanisms.
  - Early intervention is crucial in managing JIA, with studies emphasising the importance of timely referrals to paediatric rheumatologists for best outcomes.

Read More: Penicillin Revival to Fight Rheumatic Fever

CPCRI Introduces New Varieties for Coconut and Cocoa Cultivation

The **Central Plantation Crops Research Institute (CPCRI)** recently developed a new variety of **coconut** along with two new varieties of **cocoa** aimed at revolutionising coconut and cocoa cultivation in India.

- **Kalpa Suvarna,** the coconut variety is ideal for tender coconut and copra production, with specific characteristics like **large-sized fruits, high water content, and oil content.**
- The cocoa varieties, **VTL CH I and VTL CH II,** have high fat and nutrient contents, with VTL CH II being tolerant to **black pod rot.**
  - Black pod rot is a fungal disease that affects Cocoa Trees. It is majorly caused by fungal species belonging to the **genera Phytophthora.**
- VTL CH I is suitable for growing in **Karnataka, Kerala, Tamil Nadu, and Andhra Pradesh,** while VTL CH II is recommended for high rainfall regions in **Karnataka, Kerala, Gujarat, and Tamil Nadu.**
  - Both cocoa varieties yield 1.5 kg to 2.5 kg of dry beans per tree per year.
- CPCRI was founded in 1916 by the Government of Madras and was later incorporated into the Indian Central Coconut Committee in 1947.
  - In 1970, it became part of the National Agricultural System (NRS) under the **Indian Council of Agricultural Research (ICAR).**
  - It focuses on researching and developing genetically superior planting materials for coconut, arecanut, cocoa, cashewnut, and spices.

GRID-INDIA Attains Miniratna Category-I Status

GRID Controller of India Limited (GRID-INDIA) reached a significant milestone as it was designated as a **Miniratna Category-I Central Public Sector Enterprise (CPSE)** by the Ministry of Power highlighting its pivotal role in the nation's power sector.

- Established in 2009, GRID-INDIA oversees the seamless operation of the Indian Power System, ensuring efficient power transfer within and across regions.
  - It manages the All India synchronous grid through five **Regional Load Despatch Centres (RLDCs)** and the **National Load Despatch Centre (NLDC),** playing a crucial role in the power landscape.
- GRID-INDIA manages competitive electricity markets, prioritising reliability, sustainability, and fair competition for integrated power system operations.

Note:

Classification of CPSEs			
Category	**Launch**	**Criteria**	**Examples**
Maharatna	❍ **Maharatna Scheme** was introduced for CPSEs in May, 2010, in order to **empower mega CPSEs to expand their operations and emerge as global giants.**	❍ Having **Navratna status.** ❍ Listed on Indian stock exchange with minimum prescribed public shareholding under **Securities and Exchange Board of India (SEBI)** regulations. ❍ An **average annual turnover of more than Rs. 25,000 crore** during the last 3 years. ❍ An average annual **net worth of more than Rs. 15,000 crore** during the last 3 years. ❍ An average **annual net profit after tax of more than Rs. 5,000 crore** during the last 3 years. ❍ Should have **significant global presence/international operations.**	❍ Bharat Heavy Electricals Limited, Bharat Petroleum Corporation Limited, Coal India Limited, GAIL (India) Limited, etc.
Navratna	❍ **Navratna Scheme** was introduced in **1997** in order to identify CPSEs that enjoy comparative advantages in their respective sectors and **to support them in their drive to become global players.**	❍ The **Miniratna Category – I and Schedule 'A' CPSEs, which have obtained 'excellent' or 'very good' rating** under the Memorandum of Understanding system in three of the last five years, and have composite score of 60 or above in the **six selected performance parameters,** namely, ❍ Net profit to net worth. ❍ Manpower cost to total cost of production/services. ❍ Profit before depreciation, interest and taxes to capital employed. ❍ Profit before interest and taxes to turnover. ❍ Earning per share. ❍ Inter-sectoral performance.	❍ Bharat Electronics Limited, Hindustan Aeronautics Limited, etc.
Miniratna	❍ **Miniratna scheme** was introduced in **1997** in pursuance of the policy objective **to make the public sector more efficient and competitive** and to grant enhanced autonomy and delegation of powers to the profit-making public sector enterprises.	❍ **Miniratna Category-I:** The CPSEs which have **made profit in the last three years continuously,** pre-tax profit is Rs.30 crores or more in at least one of the three years and have a positive net worth are eligible to be considered for grant of Miniratna-I status. ❍ **Miniratna Category-II:** The CPSEs which have **made profit for the last three years continuously and have a positive net worth** are eligible to be considered for grant of Miniratna-II status. ❍ Miniratna CPSEs **should have not defaulted in the repayment of loans/interest payment on any loans** due to the Government. ❍ Miniratna CPSEs **shall not depend upon budgetary support or Government guarantees.**	❍ **Category-I:** Airports Authority of India, Antrix Corporation Limited, etc. ❍ **Category-II:** Artificial Limbs Manufacturing Corporation of India, Bharat Pumps & Compressors Limited, etc.

Read more: Maharatna Status to REC

India's First Integrated Oil Palm Processing Unit in Arunachal Pradesh

The inaugural commercial operations of India's premier **integrated Oil Palm Processing Unit,** established by **3F Oil Palm** (one of the nation's leading Oil Palm development enterprises), commenced recently. This factory is located in Roing within the lower Dibang Valley of **Arunachal Pradesh.**

➢ Despite significant potential, India currently struggles with achieving self-sufficiency in edible oils, importing **96% of its required palm oil,** which makes up 67% of the country's edible oil import bill, totaling over **Rs. 1 Lakh crore.**

❍ This milestone marks a crucial step in India's quest for self-reliance in edible oils, bolstered by the **National Mission on Edible Oils - Oil Palm (NMEO-OP).**

Note:

- India is the **second-largest consumer of edible oil** globally and one of its largest importers.
  - India imported 16.5 million metric tons (MT) of edible oil in 2022-23 including: palm (9.8 MT from Indonesia, Malaysia and Thailand), soyabean (3.7 MT from Argentina and Brazil) and sunflower (3 MT from Russia, Ukraine and Argentina).
  - **Indonesia and Malaysia** are the main global palm oil producers, followed by **Thailand, Colombia, and Nigeria.**

Read more: Palm-Oil Production

Test-Firing of Indigenous 1500 HP Tank Engine

Recently, the Defence Secretary presided over the maiden **test-firing of the country's first indigenously-made 1500 Horsepower (HP) engine for Main Battle Tanks** at BEML Limited's (formerly Bharat Earth Movers Limited) Engine division in Mysuru complex.

- The 1500 HP engine represents a paradigm shift in **military propulsion systems**, possessing cutting-edge features such as a **high power-to-weight ratio,** and operability in **extreme conditions**, including high altitudes, sub-zero temperatures and desert environments.
  - Equipped with advanced technologies, the engine stands on par with the most advanced engines globally,
- India has many main battle tanks (MBTs), including the T-90M Bhishma, ARJUN MBT, and K-9 Vajra.
- BEML Limited, a '**Schedule 'A' Company under the Ministry of Defence,** plays a pivotal role and serves India's core sectors like Defence, Rail, Power, Mining and Infrastructure.

Read more: Arjun MBT MK-1A

IceCube: Exploring Neutrinos from Earth's South Pole

The IceCube neutrino observatory at the **Earth's South Pole** detected subatomic particles called **neutrinos**.

- Neutrinos are **electrically neutral, undisturbed by even the strongest magnetic field,** and rarely interact with matter, earning the nickname **"ghost particle."** As neutrinos travel through space, they pass unimpeded through matter - stars, planets and, for that matter, people.
- A neutrino is a **fermion** (an elementary particle with spin of ½) that **interacts only via weak interaction and gravity.**
- They are created in nuclear processes and also created when protons (subatomic particles) and (atomic) nuclei interact at very high energies.
- The ability **to use particles like neutrinos in astronomy** enables a more robust examination of the universe as many aspects of the universe are indecipherable using light alone.
- India-based Neutrino Observatory (INO): The INO Project is aimed at building a world-class underground laboratory with a rock cover to conduct basic research on neutrinos.
  - The observatory will be located underground to provide adequate shielding to the neutrino detector from cosmic background radiation.

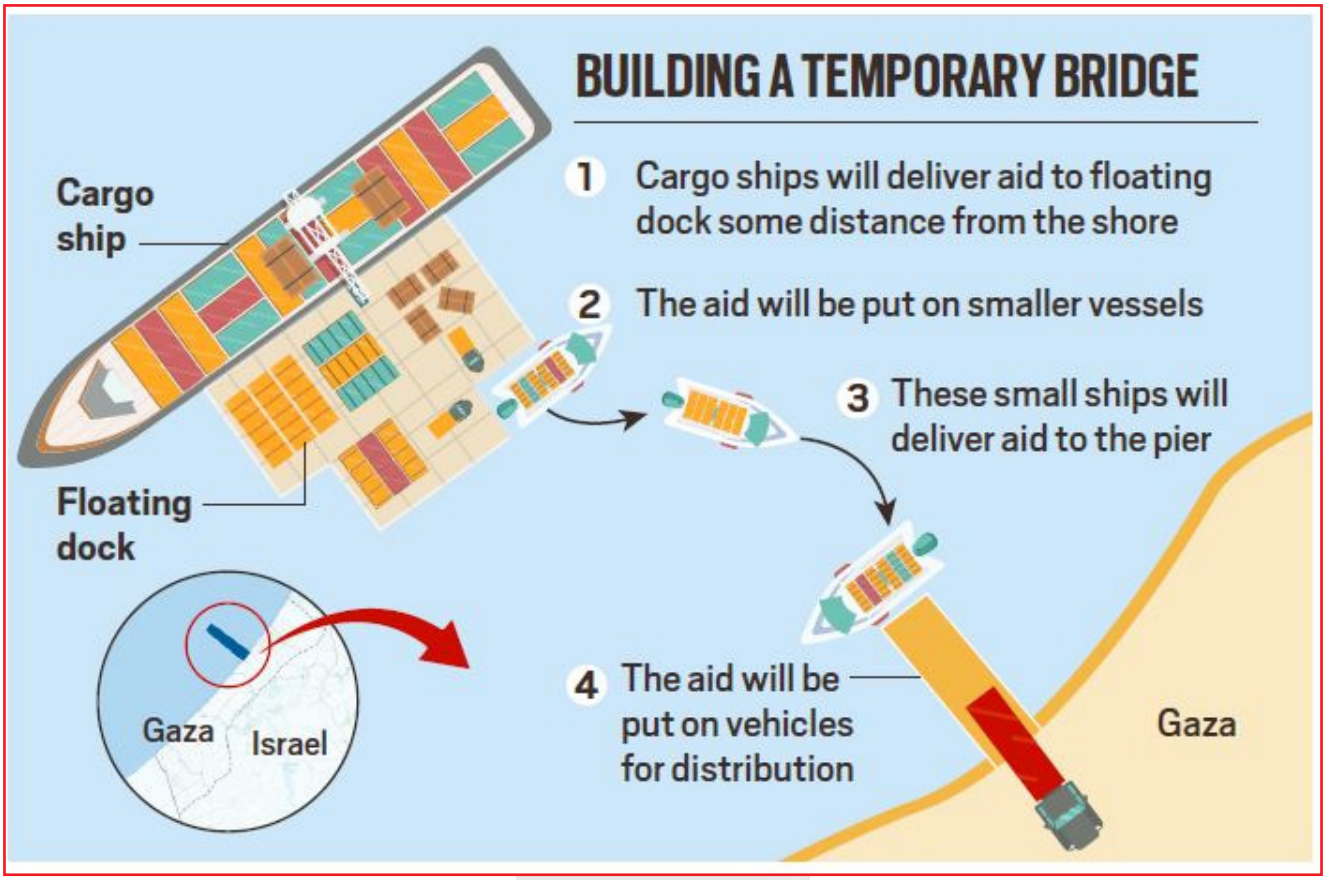
Read More- Pillars of Creation, James Webb telescope, Indian Neutrino Observatory

JLOTS Project

The US plans to deliver aid to Gaza from a floating dock at sea through the **Joint Logistics Over-the-Shore Project** (JLOTS). The goal is to deliver aid equivalent to **two million meals a day** to Gaza.

- JLOTS capabilities are **used to transport cargo by sea when** one or more **ports cannot be operated** or are not available for loading or unloading.
  - Overall, JLOTS integrates infrastructure, logistics, security, and environmental considerations **to facilitate effective disaster response and humanitarian aid delivery.**
- The project will consist of **two main components, a floating dock** and **a long pier** with a causeway.
  - The **floating dock** will be constructed using steel components delivered to the site by a roll-on, roll-off ship, a type of cargo vessel equipped with a platform for loading and unloading heavy cargo.
  - The **pier will connect to the shore,** while the dock could be placed up to a kilometre away. This **setup ensures that aid-carrying ships avoid the risk of getting stuck in shallow waters** near the shore.

Note:



Read more- Israel-Hamas Conflict and its global impact, Israel-Palestine conflict

Tiger Triumph

Recently, the joint India-U.S. tri-service Humanitarian Assistance and Disaster Relief (HADR) Exercise, **Tiger Triumph,** commenced on the Eastern seaboard.

- The primary objective of the exercise is to enhance interoperability for conducting HADR operations and refine **Standard Operating Procedures (SOPs)** to facilitate swift and effective coordination between the armed forces of both countries.
- This exercise includes ships with helicopters and landing crafts, Indian Navy aircraft, Indian Army personnel and vehicles, Indian Air Force aircraft and helicopters, and the Rapid Action Medical Team (RAMT).
- Other Exercises Between India and US are-
  - Yudh Abhyas
  - Vajra Prahar
  - Cope India

Read more: India-US Relations

HbA1C Test

India faces a significant diabetes burden, accounting for **17% of global cases.** The **Haemoglobin A1C (HbA1C) test,** also known as the **glycated haemoglobin** or **glycosylated haemoglobin test**, plays a crucial role in early detection and management.

- The HbA1C test provides a **2-3 month average of blood glucose levels** by measuring **sugar-coated red blood cells,** offering comprehensive long-term control assessment.
  - Unlike **fasting and post-meal tests**, it remains **unaffected by recent meals, ensuring reliability.**
  - An Hb1A1C **below 5.7% is considered normal;** between 5.7 and 6.4% may indicate you are **pre-diabetic;** and **6.5% or higher can indicate diabetes.**
    - Factors such as kidney or liver failure, anaemia, certain medications, and pregnancy can influence the test results.
- India has **10.13 crore people with diabetes** and 13.6 crore pre-diabetic individuals. Over **35% of Indians**

Note:

suffer from hypertension and nearly **40% from abdominal obesity,** both risk factors for diabetes.

- The test is not a standalone diagnostic tool and may be used alongside other tests for a comprehensive assessment.

Read more: Detection of Pre-Diabetes, Coping with Type-1 Diabetes

SAKHI: Enhancing Astronaut Capabilities for Gaganyaan Mission

The Vikram Sarabhai Space Centre (VSSC), under the Indian Space Research Organisation (ISRO), has developed an innovative and versatile application called the **Space-borne Assistant and Knowledge Hub for Crew Interaction (SAKHI)** to support astronauts during the Gaganyaan space flight mission.

- SAKHI offers access to technical information, facilitates communication, monitors health, ensures connectivity with **Earth and onboard systems, and manages dietary schedules.**
- Strapped to space suits, SAKHI helps astronauts access data, maintain logs, and stay informed about their well-being, enhancing safety and efficiency for the Gaganyaan mission and aligning with ISRO's goal of advancing space exploration.

Read more: Gaganyaan

NATO's DIANA Program

Recently, the **Defence Innovation Accelerator for the North Atlantic (DIANA)** initiative board approved a proposal to **establish an accelerator and two test centres in Finland,** with a mission to foster technology, innovation, and business development for both civil and defence purposes.

- DIANA is a North Atlantic Treaty Organization (NATO) established organization to **accelerate dual-use innovation capacity** across the Alliance. It provides companies with resources, networks, and guidance to develop deep technologies for critical defence and security challenges.
- All **NATO nations are members of DIANA**. The DIANA Board of Directors is responsible for governance and comprises representatives from every Allied country.

Read more: North Atlantic Treaty Organization (NATO)

India and Brazil hold First Inaugural '2+2' Dialogue

India and Brazil conducted their **first-ever** '2+2' defence and foreign ministerial dialogue, discussing cooperation in key areas.

- The talks focused on expanding cooperation in various areas, including energy, critical minerals, technology, and counter-terrorism.
- The '2+2' defence and foreign ministerial dialogue involves the participation of the **defence and foreign ministers of two countries,** along with their respective counterparts, to discuss strategic and security-related issues, as well as diplomatic matters.
- India conducts '2+2' dialogues with key strategic partners: the **US, Australia, Japan, and Russia.** The US holds the oldest and most significant '2+2' talks partnership with India.

Read more: India-Brazil Relations, India-US 2+2 Ministerial Dialogue, India-Australia 2+2 Ministerial Dialogue

LAMITIYE-2024

Recently, the Indian Army contingent participated in the **10th edition of Joint Military Exercise "LAMITIYE-2024"** with the **Seychelles Defence Forces (SDF)**.

- LAMITIYE, meaning 'Friendship' in Creole language (one of the official languages in the Seychelles), has been a **biennial training event since 2001.**
- **Aim:** Enhance interoperability in Sub-conventional Operations in Semi-Urban environments under Chapter VII of the United Nations Charter on Peace Keeping Operations.
- **Activities:** Field Training Exercise, combat discussions, lectures & demonstrations.
- **Importance:** Building and promoting bilateral military relations, exchanging skills and experiences.
- Seychelles is an island nation in the Indian Ocean, **northeast of Madagascar**. The country is known for its beaches, coral reefs, nature reserves, and rare animals, including giant Aldabra tortoises.
  - The **Aldabra Atoll, a** UNESCO World Heritage Site, is the world's largest raised coral atoll and It is home to the largest giant tortoise population in the world.

Note:

Read more: India-Seychelles

Indian Army's AH-64E Apache Helicopter Induction

The **Indian Army Aviation Corps** took a significant step towards modernisation with the establishment of its first unit dedicated to operating **AH-64E Apache attack helicopters** in Jodhpur, Rajasthan.

- In 2020, **Boeing** signed an agreement with the Government of India for the acquisition of six more Apache helicopters for the Indian Army.
  - The **AH-64 Apache** is the world's most advanced multi-role combat helicopter. Used by the US Army and a growing number of international defense forces.
- This marks a pivotal moment as the Apaches will become the **second attack helicopters** in the Army's arsenal, following the indigenous **Light Combat helicopter Prachanda**.

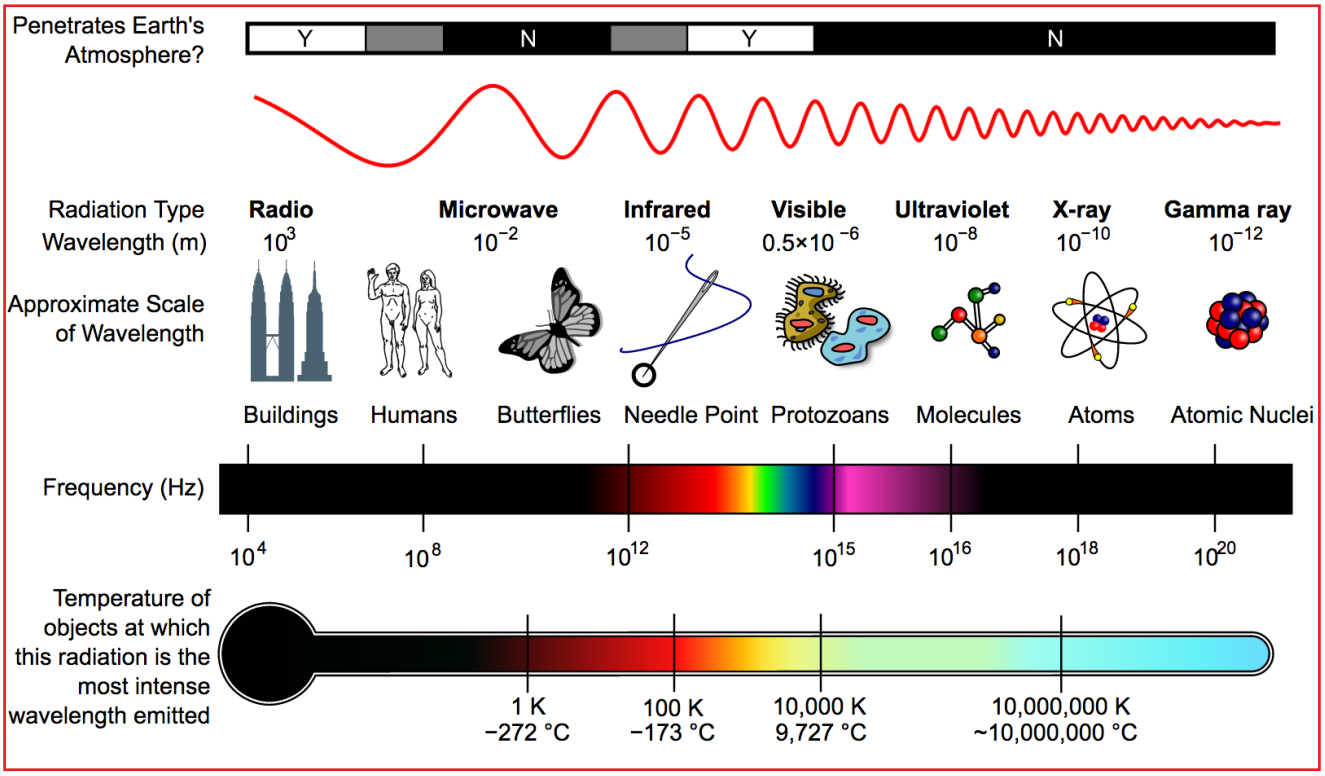
Read more: AH-64E Apache attack helicopters

Camera Shows How Animals See Motion

Recently, researchers in the US have put together a **new camera with the ability to view the world like animals do.**

Note:

- The specialised cells that respond to the light, called **photoreceptors,** are unique to each animal. For example, while **human eyes can detect only wavelengths of light in the visible range** (between 380 and 700 nanometres (nm)), **honey bees and many birds can also perceive ultraviolet light** (10-400 nm).
- Animals use colours to intimidate their predators, entice mates or conceal themselves. Detecting variations in colours is thus essential to an animal's survival.
- Animals have evolved to develop highly sensitive photoreceptors that can detect light of ultraviolet and infrared wavelengths.



Exercise Bharat Shakti

A **Tri-Services Live Fire and Manoeuvre Exercise** named "**Bharat Shakti**" is being conducted in Pokhran, Rajasthan, demonstrating India's indigenous defence capabilities.

- It included successful test firing of the long-range **AGNI missile** with advanced **MIRV technology.**
- Key equipment and weapons systems featured in the exercise include **T-90 (IM) Tanks,** Dhanush and Sarang Gun Systems**, Akash Weapons Systems**, Logistics Drones, Robotic Mules, Advanced Light Helicopters (ALH), Naval Anti-Ship Missiles, **Light Combat Aircraft Tejas,** Light Utility Helicopters, and Advanced Light Helicopters.
  - However, the **LCA Tejas fighter jet tragically crashed** during a training exercise.

Read more: **Exercise Kavach**

Conflict in the Democratic Republic of Congo (DRC)

Recent clashes in the eastern **Democratic Republic of Congo (DRC)** have sparked international concern and worsened the already severe **humanitarian situation** in the area.

- Many fatalities and thousands displaced due to clashes between the **Congolese army** and the **Rwandan-supported M23 group** near **Goma in North Kivu province.**
- **About:**
  - The DRC is 2nd **largest country in Africa** and the 11th largest in the world.
  - It has a small coastline with the Atlantic Ocean. DRC is bounded to the **north by the Central African Republic and South Sudan**; to **the east by Uganda,**

Note:

Rwanda, Burundi, and Tanzania; to the **southeast by Zambia**; and to the **southwest by Angola.**

- **Kinshasa,** the capital of the DRC, is located on the **Congo River,** the only river to **cross the equator twice** in Africa.

- The official language is **French**, but other languages include **Kituba, Lingala, Swahili, and Tshiluba.**
- **Katanga Plateau** is considered to be a rich mining region, which supplies cobalt, copper, tin, radium, uranium, and diamonds.

ETHANOL 100

The Ministry of Petroleum & Natural Gas launched **'ETHANOL 100'** at select 183 retail outlets in Maharashtra, Karnataka, Uttar Pradesh, New Delhi, and Tamil Nadu.

- ETHANOL 100 is a revolutionary automotive fuel that **consists of 100% ethanol.**
  - It is a biofuel produced from **renewable sources such as corn, sugarcane, or other plant materials.**
- ETHANOL 100 is aimed at reducing **dependence on fossil fuels,** promoting sustainability, and contributing to a cleaner environment by lowering **greenhouse gas emissions** compared to traditional gasoline.
- The initiative aligns with the vision **to achieve 20% ethanol blending (E20) by 2025-26,** reducing import dependency and boosting the agriculture sector.
- The move towards ETHANOL 100 reflects a shift towards **sustainable technologies and decarbonization.**
- ETHANOL 100 is versatile and can be used in various vehicles, **including flex-fuel vehicles (FFVs)** that can run on gasoline, ethanol, or any blend of the two. This demonstrates its practicality and potential to become a mainstream fuel option with the appropriate infrastructure.

Read more: India's Ethanol Revolution: Progress & Challenges

Foundational Literacy and Numeracy Assessment Test

Recently, the Department of School Education and Literacy (DoSEL), Ministry of Education, conducted a **Foundational Literacy and Numeracy Assessment Test (FLNAT)** as part of the **ULLAS (Understanding Lifelong Learning for All in Society) - Nav Bharat Saaksharta Karyakram** across 23 states, with an estimated 37 lakh learners participating.

- The FLNAT assesses Reading, Writing, and Numeracy skills, to evaluate foundational literacy and numeracy skills.
  - The test will be conducted in all districts of participating States/UTs at District Institutes of Education and Training (DIETs) and Government/ aided schools.
- FLNAT aims to certify non-literate learners and promote **multilingualism** by conducting the test in regional languages, aligning with **National Education Policy (NEP) 2020.**
  - Learners who qualify will receive a certificate from the **National Institute of Open Schooling (NIOS)** recognising their achievement in foundational literacy and numeracy skills.
- New India Literacy Program, popularly known as **ULLAS** is a **centrally sponsored scheme** for the period 2022-2027 to cover all aspects of **Education For All, previously known as Adult Education.**
  - The **scheme empowers adults aged 15 and above** with basic literacy, numeracy, and critical life skills, fostering lifelong learning. Implemented through volunteerism, it promotes social responsibility and access to regional language content on the **DIKSHA Portal and ULLAS mobile app.**

Read more: Foundational Literacy and Numeracy, National Education Policy (NEP) 2020

Note:

Para Archer Sheetal Devi Named ECI National PwD Icon

Recently, the **Election Commission of India** has announced **Para Archer and Arjuna Awardee, Sheetal Devi (**winner of 2 gold and 1 silver medal in the **Asian Para Games 2022) as its National Person with Disabilities (PwD) Icon**.

- Her name was announced at an Exhibition Cricket Match between the Indian Deaf Cricket Association Team and District Cricket Association team, held in Delhi.
- The match was organised to **foster voter education and inclusivity**. On the occasion, the Commission launched a dedicated Voter's Guide for PwDs and Senior Citizen Electors.
- The commission also highlighted key initiatives undertaken for PwDs like **optional home voting facility for PwDs** with benchmarked disabilities, provision of free transportation on poll day, the appointment of State and District PwD Icons, awareness campaigns, the **Saksham ECI App, Braille enabled EPICs and EVMs.**

Read More- **Election Commission of India, National Awards**

India and Dominican Republic to Strengthen Economic Ties with JETCO Protocol

The protocol for the establishment of the **Joint Economic and Trade Committee (JETCO)** between India and the **Dominican Republic** was signed at **Santo Domingo (Capital of the Dominican Republic).**

- The protocol envisages strengthening and develop cooperation on trade, services, industrial technologies and various other sectors by means of technical assistance, training programmes and capacity building.
- Diplomatic relations between **India and Dominican Republic** were established in May 1999. However, at present, **there is no bilateral institutional mechanism** between India and the Dominican Republic on trade and commerce.
  - **India primarily imports gold from the Dominican Republic** and exports pharmaceuticals, marine products, motor vehicles, two and three-wheelers etc.

Read more: India-Dominican Republic Relations

Centre Amends IT Rules for Interception Record Destruction

The government has amended the **Information Technology (IT) rules** to allow for the Home Secretary or other **bureaucrats** in the Centre to issue directions to destroy digital records of interception or decrypt information.

- So far, the power lies with security agencies, such as **law enforcement bodies**.
- The amendment, outlined in a gazette notification by the IT Ministry, involves a modification t**o Section 23 of the Information Technology (Procedure and Safeguards for Interception, Monitoring, and Decryption of Information) Rules, 2009.**
  - Specifically, the term "security agency" has been replaced with **"competent authority and the security agency,"** granting the Centre broader powers to issue directives for the destruction of digital evidence.
- Rule 23 of the law mandates that all records, including electronic ones related to interception, monitoring, or decryption of information, must be destroyed by security agencies every six months, unless deemed necessary for functional purposes.

Read more: New IT Rules

Note:

Boosting Fintech Education and Innovation

The Government of India and the **Asian Development Bank (ADB)** have signed a USD 23 million loan agreement to enhance access to quality **fintech** education, research, and innovation at the **Gujarat International Finance Tec-City (GIFT-City).**

- The project will establish an **International Fintech Institute (IFI)** to strengthen fintech education, boost startup success rates, and drive fintech research and innovation.
  - Emphasis will be placed on **market-driven fintech skills programs,** private sector investment, and collaboration between industry, institutes, and partners for holistic growth.
  - IFI will offer industry-aligned fintech training programs meeting international standards and supporting innovation and entrepreneurship.
- The ADB program will support research in **climate fintech, regulatory technology, social inclusion, and gender equality** in finance to develop new solutions and a state fintech readiness index.
- **GIFT-City** is a business district and the **first operational greenfield smart city in India.** It's located on the banks of the **Sabarmati River in Gujarat**
  - It is inclined to provide a conducive business ecosystem at par or above with leading global financial hubs.
  - It consists of a multi-service **Special Economic Zone (SEZ),** which houses **India's first International Financial Services Centre (IFSC)** and an exclusive **Domestic Tariff Area (DTA).**

Read more: GIFT City and Bullion Exchange, ADB Regional Conference and PM Gati Shakti

India's First Green Hydrogen Plant in the Stainless Steel Sector

Recently, the Union Minister for Steel, virtually inaugurated **India's 1st Green Hydrogen Plant** in the **Stainless Steel Sector** located at Jindal Stainless Limited, Hisar. It is the world's first **off-grid green hydrogen plant** dedicated to the stainless steel industry.

- Conventional steel production relies heavily on **coal**, a major source of **greenhouse gasses**. This dependence is problematic for India's environmental goals. Green hydrogen offers a cleaner alternative.
  - The plant targets a considerable reduction in carbon emissions, aiming to **cut around 2,700 Metric Tonnes per annum** and 54,000 tons of CO_2 emissions over the next two decades.
- Stainless steel is a type of steel alloy that contains a minimum of 10.5% chromium by mass.
  - It is known for its **exceptional corrosion resistance**, making it highly suitable for various applications where durability and resistance to rust and staining are essential.
- India is the **world's second-largest producer of crude steel**, with an output of 125.32 million tonnes (MT) of crude steel and 121.29 MT of finished steel production in FY23.
  - India is also a **net exporter of steel** witnessing an export of 6.72 MT of finished steel against the import of 6.02 MT in 2022-23.

Read more: Steel Sector, Green Hydrogen

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Note: