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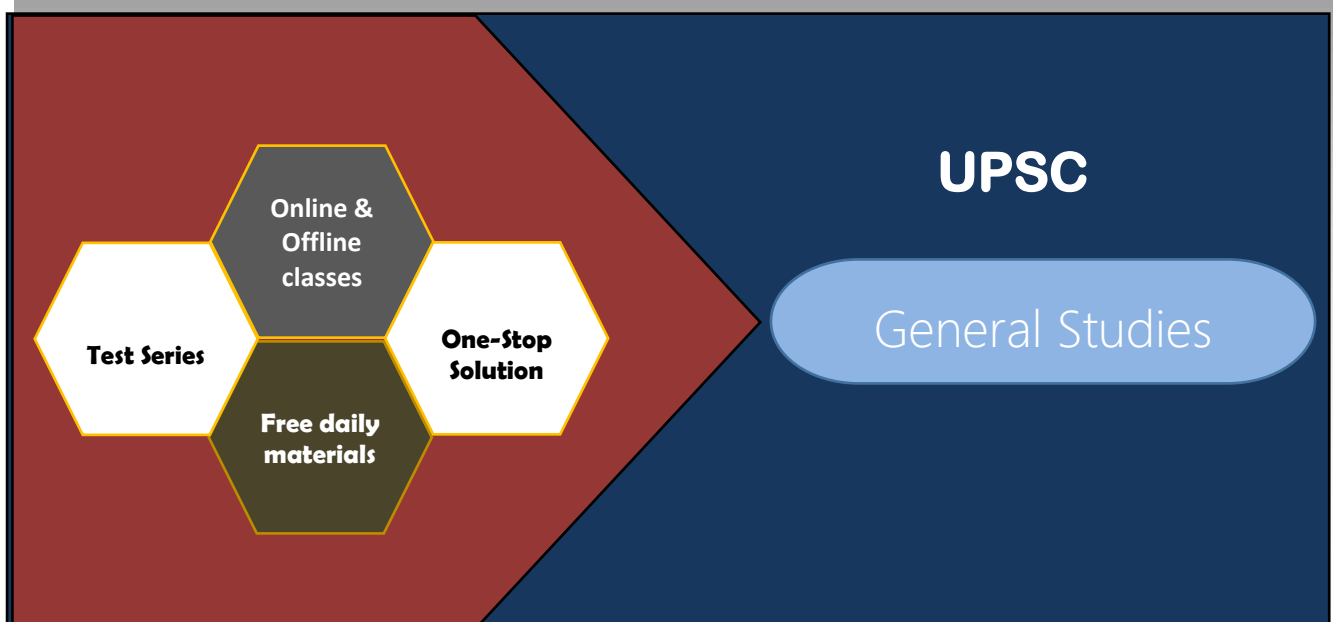
**Monthly current affairs magazine**

**SHIKSHA**

**A MAGAZINE FOR CIVILSERVICES PREPARATION**

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**Articles of the day  
THE HINDU & INDIAN EXPRESS**



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## GS 1 : Heritage, culture ,Geography of the World and Society

### 1. Challenges and components in cyclone forecasting

- Though meteorologists had forecast a historic hurricane season for 2024 based on the expectation that a strong La Niña would emerge this winter, 2024 has evolved to be a year with a summer with no major hurricanes.

#### 2024 hurricane projection

- **2023 Hurricane season** - It was history's fourth-most active despite the strong El Niño that year.
- **2024 Hurricane Forecast** - Meteorologists had forecast a historic hurricane season for 2024 based on the expectation that a strong La Niña would emerge this winter. Usually, subdued hurricane season emerge during an El Niño and an earnest one during a La Niña.
- **Failure of projection** - 2024 has evolved to be a year with a summer with no major hurricanes.
- **Truant La Nina** - One important reason for the failure of forecast was the weakness of La Niña.

#### Components of forecasting cyclones

- **Satellites** - By monitoring sea surface temperatures, cloud formations and wind patterns to detect the early formation of cyclones.
- **Doppler radar** - It provides detailed information about wind speeds and precipitation patterns.
- **Weather buoys** - These floating devices gives real-time data of atmospheric pressure and sea surface temperatures.
- **Climate models** - They estimate the likelihood and intensity of cyclonic activity by using broader atmospheric and oceanic metrics.
- **Numerical weather prediction model** - Post-processing techniques to improve forecasts of tropical cyclone track, intensity, and wind structure.
- Statistical and machine learning methods for predicting tropical cyclone intensity change.

#### Challenges in cyclone forecasting

- **Limitation of climate models** - They forecast cyclones not explicitly but indirectly, based on metrics that indicate cyclonic activity and its potential intensity

- **Global warming** - Rising Ocean temperatures are increasing the frequency of stronger cyclones, making it harder for traditional forecasting methods to keep pace.
- **Link between hurricanes and ENSO** - Climate change is starting to affect the traditional relationship between ENSO and hurricane intensity.
- **Rapid intensification** - Warming of upper oceans in all cyclone-producing regions of the planet led to many instances of rapid intensification that affects cyclone forecast.
- **Impacting preparedness** - These challenges are critical, as it directly affects how governments and communities prepare for and respond to cyclones

### Factors influencing cyclone in Indian ocean

- **Ocean stretch** - The typical stretch of ocean limits cyclone intensification, over both the Arabian Sea and the Bay of Bengal, thus limiting the size and strength of the cyclones.
- **Movement of cyclone** - Most cyclones over the Arabian Sea tend to be steered northwestward, away from India.
- **Chronic stressors** - India is vulnerable to chronic stressors such as ocean warming, rising sea levels, and the increasing incidence of rainfall extremes and dry spells.
- **Acute stressors** - These acute stressors exacerbate the chronic ones, leading to more damaging events like heavy rainfall events, flooding, and flash drought.
- **Combination of acute and chronic stressor** - Cyclone induced flooding worsens as sea levels rise or heatwaves during droughts devastate crops and reduce water availability.

### What are the needs of effective forecasting?

- **Disaster management** - Accurate forecasting is essential to plan for cyclone mitigation and adaptation measures.
- **Resource management** - India remains an economically developing country, and any increments in its ability to manage its financial and human resources will be critical for the foreseeable future.
- **Sustainability** - India's dream of sustained economic development need the resilience of entire subcontinent.
- **Security** - India's vulnerabilities to chronic and acute climate stressors aren't only India's socio-economic vulnerabilities, but also India's national security issues.

### Way forward

- **Hyperlocal risk projections** - India must focus on local predictions for cyclones that will help allocate resources more efficiently and enhance disaster preparedness.
- **Infrastructure enhancement** - Infrastructure upgradation is required in the installation of ocean observation systems and in high-resolution earth observation satellites.
- **Developing India-specific weather models** - That are able to understand and simulate Indian conditions more accurately.
- **Mitigation and adaptation** - By investing in renewable energy, weather forecasting, early warning systems, and disaster management.

## 2. Concerns of labour employment of women and its underlying factors

- A recent report of The India Human Development Survey (IHDS) shows that despite advancements in education and societal engagement, women's wage labour participation has stagnated.

### Women empowerment

- **Women's empowerment** - It is the process of women gaining the power and control to make their own choices, and to influence social change. It includes four areas of development,
  1. Personal efficacy
  2. Power in intra-household bargaining
  3. Societal engagement
  4. Access to income-generating activities

### Concerns in women employment

- **Stagnated waged employment** - Among the four key areas there is an improvements in the first three domains and the fourth, access to waged employment has stagnated.
- The IHDS recorded a drop from 18% in 2012 to 14% in 2022 among women aged 20-29.
- For women in their 30s, participation levels have also plateaued.
- **Unpaid contribution** - Women continue to contribute to the economy by working on family farms, and it reflects the increase in women's participation in work as per the Periodic Labour Force Survey.
- **Skewed employment growth** - U-shaped relationship between education and FLFP rate where the FLFP rate is generally higher among women with little or no education.
- As the level of education increases, the FLFP rate declines, before eventually rising for highly educated women.

## Underlying factors

- **Lack of suitable opportunities** – Surveys reveal that most women and families are open to wage work, provided suitable opportunities exist.
- **Job scarcity** – Due to growing unemployment in India reduces roles for women with higher qualifications hinder participation.
- **Conservative social norms** – It emphasizes the duty, traditional values, and social institutions. Preservation of traditional family structures and gender roles.
- **Patriarchal mindset** – Which causes intolerance towards women in society has created the largest obstacle for women to succeed.
- **Socio-cultural misconceptions** – Women empowerment is often seen as opposing Indian culture, especially when women challenge traditional norms.
- **Work place hurdles** – Women in the workplace face other challenges such as sexual harassment, pregnancy discrimination, imposter syndrome.
- Infrastructure limitations, such as inadequate childcare and work commutes, exacerbate the issue.
- **Unhealthy practices** – Unequal opportunities and distribution of work in private sector.
- Issues related to privacy such as asking personal questions to female candidates discourage women from entering the workspace.
- Lack in proper execution of **gender-friendly policies** fuel the increasing gender gap in employment.

## Way forward

- Access to income-generating activities lags behind.
- Expand skill development programs tailored to emerging industries.
- Enhance support systems like transportation and childcare.
- Promote equitable hiring practices in the private sector.
- Gender-inclusive employment guarantee scheme to help women come forward and avail job opportunities on a greater level.

## GS 2 : Polity, Governance, International Relations

### 1. The rapidly growing expenditure of elections

- According to the Centre for Media Studies (CMS), the total expenditure by various political parties for the general election to Lok Sabha this year was around 1,00,000 crores.
- Urgent reforms are needed to address the burgeoning cost of election expenditures which threaten foundational principles of democracy.

#### Limits in India

- The election expenditure limit for candidates is ₹95 lakh per Lok Sabha constituency in larger States and 75 lakh in smaller States. With respect to Legislative Assemblies, they are 40 lakh and 28 lakh for larger and smaller States respectively.
- These limits are set, from time to time, by the Election Commission (EC).
- There are no limits on the expenditure of political parties during elections.

#### Challenges

- Elections across democracies have become expensive. Such increased expenditure that is met primarily through large donations creates an unholy nexus between the elected representatives and donors. This also acts as an entry barrier into electoral politics for many well-meaning citizens.
- In India, candidates from all major political parties breach the election expenditure limits. Further, there are no limits on political party spending during elections.
- The official expenditures declared by the BJP and Congress for the 2019 election were 1,264 crores and 820 crores, respectively. However, according to a report by the CMS, 50,000 crore was spent by various parties during the 2019 election.
- The CMS has estimated that spending during the 2024 election by various political parties was close to 1,00,000 crores. Such inflated election expenditure fuels corruption, resulting in a vicious cycle.

#### Possible reforms

- The Indrajit Gupta Committee (1998) and the Law Commission report (1999) have advocated for State funding of elections.
- Simultaneous elections are touted as a panacea for addressing the issue of rising expenditures. However, there are challenges on account of principles of federalism and constitutional amendments to this idea. It must be noted that



this mechanism may rein in campaign and publicity expenditure to some extent. However, without curbing the illegal distribution of cash to voters, any form of simultaneous election will not have a significant impact on election expenditure.

- Certain practical steps to create a level playing field regarding election expenditure can be implemented. These are based on the EC's 2016 report on 'Proposed Electoral Reforms'.
  - Firstly, the law must be amended to explicitly provide that 'financial assistance' by a political party to its candidate should also be within the candidate's prescribed election expenditure limits.
  - Secondly, there should be a ceiling on political party expenditures. This may be kept at not more than the expenditure ceiling limit provided for a candidate multiplied by the number of candidates of the party contesting the election.

## **2. Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB - PMJAY)**

- Prime Minister Modi launched Ayushman Vaya Vandana health cards under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY) to provide health coverage to people aged 70 years and above, regardless of their income and economic status.
- Everyone age 70 or more will be entitled to a cover of Rs 5 lakh annually, shared within the family. This means if there are two elderly beneficiaries in the household, the cover will be split among them.

### **Ayushman Bharat Yojana**

- The Ayushman Bharat Yojana, also known as the Pradhan Mantri Jan Arogya Yojana (PMJAY), is a health insurance scheme launched by the Government of India in 2018. Its primary aim is to provide comprehensive health coverage of up to ₹5 lakh per family per year. It connects the public and private health sectors into a one-nation, one-system.
- PMJAY is for inpatient secondary and tertiary care. The program goes even further by covering pre and post-hospitalization expenses, ensuring a more comprehensive healthcare experience. Outpatient services are not a part of the scheme.
- The scheme targets families identified through the Socio-Economic Caste Census (SECC) data.
- It is a Centrally Sponsored Scheme and states will have to contribute 40% to the cost of the scheme.

### **Extension of AB-PMJAY to elderly**

- Elderly members (age 70 and more) of families that are already covered by their economic status will get a top-up cover of Rs 5 lakh – to be used only for the elderly.
- Those who are already covered under other government health schemes like the Central Government Health Scheme (CGHS), Ex-Servicemen Contributory Health Scheme, etc will have the option of choosing either Ayushman Bharat or continuing with their existing coverage.
- People who are covered under the Employees State Insurance Corporation (ESIC), however, will be eligible to have both their existing cover and Ayushman Bharat. This is because premiums for ESIC are paid by the insured and their employer, not the government.

### Significance of extending AB-PMJAY to senior citizens:

- With increasing lifespans and an increasing number of people ageing in the next three decades, a fifth of India is likely to be over the age of 70 by 2050. There is a need for far-reaching changes in welfare policies to tackle this demographic transition.
- Older Indians are much more likely to be hospitalised and to stay in hospitals for longer.
- According to the India Ageing Report 2023, the elderly remain largely uncovered by any health scheme. Just over 20% of India's population above the age of 60 is currently covered by any government schemes.
- Women make up the larger share of the elderly population – a survey by NITI Aayog found that 58% of the elderly are women, and 54% among them are widows.

### 3. Major challenges faced by Indian cities

- World Cities Day is celebrated annually on October 31, highlighting the growing urban population, now at 4.7 billion (57.5% of the total). This year's theme focuses on empowering youth to drive local sustainability initiatives in urban areas.
- The theme for this year's World Cities Day is "Youth Climate Changemakers: Catalysing Local Action for Urban Sustainability."
- It emphasizes the vital role of young people in driving grassroots initiatives to address climate change and promote sustainable urban development.

### India's rapid urbanization

- **Economic Distress:** Urbanization in India is largely driven by economic hardships in rural areas, leading to both rural-to-urban and urban-to-urban migration.

- **COVID-19 Impact:** The pandemic exposed the strain on urban infrastructure and highlighted the reverse migration trends, showcasing gaps in urban planning.
- **Lack of Census Data:** The absence of precise data from the 2021 Census limits understanding and planning for urban population growth, though estimates suggest around 40% of the population resides in urban areas.
- **Job Losses from Deindustrialisation:** Many cities have experienced deindustrialization since the 1980s, resulting in job losses that push displaced workers to peri-urban areas. **Overcrowding in Slums:** Approximately 40% of India's urban population lives in slums, exacerbating the challenges associated with rapid urban growth.

### Climate change and rising inequality pose to urban growth

- **Climate Change:** Indian cities face severe pollution, urban flooding, and heat island effects, which jeopardize urban sustainability and living conditions.
- **Rising Inequality:** Urban development often caters to wealthier populations, resulting in stark contrasts between exclusive developments and the significant number of urban residents lacking basic housing.
- **Social Segregation:** Increasing segregation along social and religious lines within urban settings worsens inequality and marginalizes vulnerable groups.
- **Governance Limitations:** Many urban areas are controlled by undemocratic bodies, limiting the effectiveness of governance and local engagement in urban planning.
- **Inadequate Urban Planning:** Outdated spatial and temporal planning does not address the needs of a growing urban population, further complicating the impact of climate change and social disparities.

### Steps taken by the government:

- **Smart Cities Mission:** Launched in 2015, this initiative aims to promote sustainable and inclusive urban development by investing in infrastructure, smart technologies, and urban planning to improve the quality of life in cities and enhance urban resilience.
- **Atal Mission for Rejuvenation and Urban Transformation (AMRUT):** This mission focuses on providing basic services like water supply, sewage management, and urban transport in cities, promoting sustainable urban development and improving the quality of life for residents.
- **Pradhan Mantri Awas Yojana (PMAY):** This scheme aims to provide affordable housing for all by 2022, addressing the housing shortage and improving living conditions for low-income urban residents, thereby tackling issues related to slums and inadequate housing.

### Way forward:

- **Enhance Data-Driven Urban Planning:** Need to conduct comprehensive and regular urban censuses to gather accurate demographic data, enabling evidence-based decision-making for urban policies and effective resource allocation. **Strengthen Community Engagement:** The government should foster participatory governance by involving local communities in urban planning and development processes.

### 4. Legal limitations of using Aadhaar biometric data for forensic purposes

- The Unique Identification Authority of India (UIDAI) enforces strict regulations on data disclosure to safeguard individuals' privacy and prevent misuse of personal information. Under normal circumstances, the police cannot access the demographic or biometric details stored in the Aadhaar database.
- **Stringent Privacy Protections:** The Aadhaar Act mandates strict protection of personal data, especially biometrics. *Sections 29(1) and 33(1)* prevent sharing of core biometric data (fingerprints and iris scans) with third parties, even law enforcement, barring limited situations.
- **Court Order Requirement:** *Section 33(1)* allows disclosure of certain demographic data upon the order of a High Court or above, but core biometrics are strictly protected and cannot be shared, creating limitations for police investigations involving unidentified bodies.
- **Forensic Investigative Gaps:** Police databases are often limited to individuals with criminal records, restricting the ability to identify deceased persons through fingerprints.

### Balance between privacy rights and forensic needs be achieved

- **Right to Privacy vs. Right to Dignity:** Balancing the fundamental right to privacy with the right to a dignified life and death is essential, especially in cases where access to biometric data can help identify unknown bodies.
- **Controlled Access Mechanisms:** Limited, case-specific access, such as requiring a judicial magistrate's order (*rather than a High Court order*), can allow law enforcement to use Aadhaar biometrics in cases involving unidentified bodies, reducing the burden on higher courts while preserving privacy safeguards.
- **Transparent Oversight:** Any mechanism permitting Aadhaar data usage for forensics should include robust oversight, including logging access and stringent penalties for misuse, ensuring that access is restricted to genuinely necessary cases.

- **Advanced Identification Algorithms:** Introducing algorithms similar to the U.S. *Deceased Persons Identification (DPI) system* would enable more accurate and efficient matching of deceased persons' fingerprints with larger databases.
- **Digitization of Police Records:** Digitizing state-level fingerprint databases would allow faster cross-referencing and aid forensic investigations, creating a more accessible identification system even without Aadhaar.
- **Secure Data Access Channels:** Secure and encrypted channels specifically for forensic use, with limited access, could protect the data while allowing controlled use.
- **Specific Legislative Frameworks:** There should be new amendments that could clarify circumstances under which biometric data can be accessed for deceased individuals, distinguishing these cases from broader data privacy concerns.

#### Way forward:

- **Amend Legal Framework for Controlled Access:** Need to introduce specific legislative amendments allowing limited, case-specific access to Aadhaar biometrics for forensic purposes in cases involving unidentified deceased individuals, with strict judicial oversight to maintain privacy protections.
- **Establish Secure Access Protocols and Oversight:** Need to implement secure, encrypted access channels and enforce strict oversight mechanisms, including access logging and penalties for misuse, ensuring biometric data is accessed only when absolutely necessary for forensic identification.

#### 5. Committee to assess demands on Demarcation of Eco-Sensitive areas

- The Union Environment Ministry-appointed expert committee, which is tasked with examining views and objections of state governments on eco-sensitive areas (ESA) in the Western Ghats, is likely to visit Goa soon to deliberate on the state's submissions.
- The committee will verify along with the state government whether its demands to omit villages marked as ESA are justified.

#### Key takeaways

- Early in August, the Centre had issued the sixth iteration of a draft notification declaring 56,825.7 sq. km of the Western Ghats as ecologically sensitive area.
- Once draft notification declaring 56,825.7 sqkm of the Western Ghats as ecologically sensitive area finalised, villages marked as ESA will see a

complete ban on mining, quarrying and sand mining as well as phasing out of existing mines in five years.

- The demarcation of ESA has been pending for 13 years since the United Progressive Alliance first tasked an expert panel led by senior ecologist Madhav Gadgil to study the issue of protecting Western Ghats.
- The Gadgil panel submitted a report recommending that the entire Ghats region be tagged as ecologically sensitive and creation of an overarching ecological authority to regulate development.
- However, that report was never adopted and a panel led by space scientist K Kasturirangan was later formed to demarcate ESA's using the Gadgil panel report as the foundation.
- The Kasturirangan committee report proposes 37 per cent of the total area of Western Ghats, which is roughly 60,000 square kilometres, to be declared as eco-sensitive area (ESA).
- The report recommended a blanket ban on mining, quarrying, setting up of red category industries and thermal power projects.
- It also stated that the impact of infrastructural projects on the forest and wildlife should be studied before permission is given for these activities.

## 6. How Monuments in India are conserved

- The approach of conservation of monuments in India requires a renewed relook. **Monuments** - They are remains of our prestigious past, representing culture, art architecture and structural technology of bygone days.
- **Types** - Prehistoric sites, stone age rock-shelters, Neolithic sites, Megalithic burial sites, rock-cut caves, stupas, temples, churches, synagogues, mosques, tombs, palaces, forts, bathing ghats, tanks, water reservoirs, bridges, pillars, inscriptions, mounds, kos minars, excavated sites, etc.
- **State Monuments** - State Government and Union Territories have also declared the monuments/ sites as of State importance under their respective Acts.
- **ASI** - Archaeological Survey of India is responsible for protecting and maintaining these 3679 monuments and archaeological sites declared as of national importance.

### Adopt a Heritage - program

'Adopt a Heritage: Apni Dharohar, Apni Pehchaan'

- **Adopt a Heritage Program** - It is an initiative of the Ministry of Tourism, launched in 2017, in collaboration with the Ministry of Culture and the Archaeological Survey of India.
- 66 monuments across India have come under the adoption scheme.

- **Feature** - Government invites entities, including public sector companies, private sector firms as well as individuals, to develop selected monuments and heritage and tourist sites across India.
- **Development** - Provision and maintaining of basic amenities, including drinking water, ease of access along with advanced amenities such as surveillance systems and tourism facilitation centres.
- **Monument Mitras** - Public sector companies and select private business houses that engage in the conservation of monuments.
- **Use of CSR** - There is no financial bid involved and the corporate sector is expected to use corporate social responsibility (CSR) funds for the upkeep of the site.

### Issues in managing heritages in India

- **Isolation of Monuments** - Not absorbing the monuments in to townscape and the daily lives and part of residents.
- **Non Usage** - Not opening the monuments to public and keeping them closed deteriorates the structures of the building.
- **Inconsiderate Usage** - Use of monuments to private functions, such as conferences and fashion shows and using it without the concern for conservation.
- **Reuse issue** - Use of monuments as office or institutional buildings.

### Way forward

- Change the perspective and relationship of cities with the monuments.
- Bring together the frame of history and contemporary life in ways that make them easily compatible.
- Utilization of monuments in productive manner and make it more accessible to the public.
- Renovation with fresh landscape and Constructive upgradation of monuments with modern art without damaging the structure.

### 7. PM Vishwakarma Scheme

- The Government stated that over 25 million applications have been submitted under the PM Vishwakarma Scheme since its launch. Out of these, more than 2 million applicants have successfully registered, following a thorough three-step verification process. The Ministry of Micro, Small and Medium Enterprises said that the scheme has garnered remarkable interest

### Key takeaways

- The PM Vishwakarma Scheme is a Central Sector initiative launched by the Ministry of Micro, Small, and Medium Enterprises (MSME) on September 17, 2023.
- It aims to provide comprehensive support to traditional artisans and craftspeople, collectively referred to as 'Vishwakarmas,' to enhance their skills, tools, and market access.
- The Scheme covers artisans and craftspeople engaged in 18 trades, viz. Carpenter (Suthar/Badhai), Boat Maker, Armourer, Blacksmith (Lohar), Hammer and Tool Kit Maker, Locksmith, Goldsmith (Sonar), Potter (Kumhaar), Sculptor (Moortikar, stone carver), Stone breaker, Cobbler (Charmkar)/ Shoemaker/Footwear artisan, Mason (Rajmistri), Basket/Mat/Broom Maker/Coir Weaver, Doll & Toy Maker (Traditional), Barber (Naai), Garland maker (Malakaar), Washerman (Dhobi), Tailor (Darzi) and Fishing Net Maker.

### Key Features of the Scheme:

- Recognition and Certification: Artisans receive a PM Vishwakarma certificate and ID card, acknowledging their skills.
- Skill Upgradation: Offers basic training (5-7 days) and advanced training (15 days or more) with a stipend of ₹500 per day to improve artisans' proficiency.
- Toolkit Incentive: Provides an incentive of up to ₹15,000 in the form of e-vouchers for procuring modern tools at the beginning of basic skill training.
- Credit Support: Facilitates collateral-free loans in two tranches: up to ₹1 lakh in the first tranche and up to ₹2 lakh in the second, with a concessional interest rate of 5%.
- Digital Transactions Incentive: Encourages digital payments by offering incentives to promote financial inclusion among artisans.
- Marketing Support: Marketing support will be provided to the artisans and craftspeople in the form of quality certification, branding, onboarding on e-commerce platforms such as GeM, advertising, publicity and other marketing activities to improve linkage to value chain.

### 8. Supreme Court: State Cannot Acquire Every Private Property

- In a landmark ruling that has implications on the citizen's right to hold property, a nine-judge bench of the Supreme Court ruled that not all private property can be deemed "material resource of the community" for redistribution under Article 39(b) of the Constitution.
- Falling under Part IV of the Constitution titled "Directive Principles of State Policy" (DPSP), Article 39(b) places an obligation on the state to create policy towards securing "the ownership and control of the material resources of the community are so distributed as best to subserve the common good".



## Key takeaways

- The ruling in the constitutional reference essentially undoes several decades of Supreme Court jurisprudence on the issue.
- A line of judgments holding that both public and private resources fell within the ambit of “material resources of the community” under Article 39(b) stem from a minority opinion by Justice V R Krishna Iyer in *State of Karnataka v Shri Ranganatha Reddy* (1977).
- A 1982 five-judge constitution bench ruling in the case *Sanjeev Coke Manufacturing Company vs Bharat Coking Coal Ltd*, had affirmed Justice Iyer’s view.
- The majority opinion of the SC has now disagreed with these judgments. It said Justice Iyer “cast the net wide, holding that all resources which meet material needs are covered by the phrase, and any attempts by the government to nationalize these resources would be within the scope of Article 39(b)”.
- SC added, “In essence, the interpretation of Article 39(b) adopted in these judgments is rooted in a particular economic ideology and the belief that an economic structure which prioritises the acquisition of private property by the state is beneficial for the nation.”
- As per the recent judgement, the text of the provision indicates that not all privately owned resources fall within the ambit of the place. However, privately owned resources are not excluded as a class, and some private resources may be covered.
- The SC added: “Indeed, it is this spirit and its all-encompassing nature of the constitution, which has allowed elected governments since independence to pursue economic reforms and policies based on domestic conditions, international requirements, and political exigencies of the time”.
- The majority opinion referred to India’s economic growth trajectory – the mixed economy of the 1950-60s that included heavy industries and import substitution; the shift towards purportedly “socialist reforms” in the late 1960s and 90s, followed by “market-based reforms” in the 1990s or the “liberalisation years”.
- The court said that as participants in a vibrant, multiparty economic democracy, the people of India have voted to power governments which have adopted varied economic and social policies based on the country’s evolving development strategies and challenges.

## 9. Children of India Lack Dietary Diversity

- According to a recent study, **77% of children in India aged 6-23 months do not meet the dietary diversity standards** recommended by the **World Health Organisation (WHO)**, with the country's central region having the highest rates of minimum dietary diversity failure.

### Minimum Dietary Diversity (MDD)

- It refers to a recommended standard set by the **WHO** for children aged 6-23 months.
- It suggests that **within 24 hours, children should consume foods and beverages** from at least five of the eight defined food groups. Breast milk, **grains, legumes, dairy products**, flesh foods, eggs, and fruits and vegetables. A child's diet is considered to have failed MDD if they consume food from fewer than five of these food groups.
- MDD is part of the **Infant and Young Child Feeding (IYCF) practices**, which are assessed by a suite of indicators developed by the WHO and UNICEF. The MDD is also a component of the **Minimum Acceptable Diet (MAD)** indicator.

### Key Highlights of the Study

- **Historical Comparison:** Utilising data from the **National Family Health Survey (NFHS-5)** conducted between 2019 and 2021, researchers noted a decline in the overall **failure rate of MDD** from **87.4% in NFHS-3 (2005-06)**. Despite **some improvement, over 75% of children still lack diverse diets**, highlighting an alarmingly high prevalence and ongoing challenges in ensuring adequate nutrition.
- **State Variance:** The study found that states like **Uttar Pradesh, Rajasthan, Gujarat, Maharashtra, and Madhya Pradesh** exhibited **over 80% inadequacy** in dietary diversity, reflecting significant regional disparities. In contrast, **Sikkim and Meghalaya reported levels below 50%**, highlighting successful local nutritional strategies that could be models for other regions.
- **Status of WHO Dietary Diversity Standards:** According to the study, about **35% of the global child deaths** and 11% of the total disease burden are due to inadequate nutrition. While **in India, 1 in 3 children are underweight** and stunted, and 1 in 5 children are wasted.
- **Dietary Trends by Food Groups:** Certain dietary trends have shown marked improvement. Despite these gains, **breast milk and dairy consumption declined**, with breastmilk dropping from 87% in NFHS-3 to 85% in NFHS-5 and dairy from 54% to 52%.

## Major Challenges in Achieving Dietary Diversity in India

- **Economic and Regional Disparities:** High poverty rates and regional inequalities limit access to diverse foods, particularly in central and western states.
- **Limited Nutrition Education:** A lack of awareness among caregivers, especially in rural areas, reduces understanding of balanced diets, contributing to undernutrition.
- **Public Distribution Gaps:** The PDS often focuses on staple grains, offering **limited variety** and missing nutrient-rich foods like legumes, fruits, and vegetables.
- **Healthcare Access and Counseling Deficit:** Poor access to healthcare facilities and nutrition counseling **lacks essential information**, affecting children's dietary choices.

## Way Forward

- **Strengthening Public Distribution System (PDS):** Include **nutrient-rich foods** such as pulses, legumes, and fortified cereals in PDS to improve access to a variety of food groups.
- **Expanding Nutrition Education Programs:** Implement **community-based nutrition education initiatives**, especially for mothers, on the importance of diverse diets and meal planning.
- **Enhancing ICDS and Anganwadi Services:** Intensify efforts to **monitor** child nutrition, provide counselling, and supply balanced food options through ICDS centers.
- **Leveraging Technology and Social Media:** Use digital platforms for nutrition awareness campaigns targeting rural and urban areas, focusing on easily accessible dietary diversity practices.
- **Promoting Local and Affordable Food Options:** Encourage **local cultivation** and consumption of nutrient-dense foods like pulses, fruits, and vegetables to make dietary diversity more affordable and sustainable.

## 10. AMU's minority tag : Constitutional Provisions and Historical Background of the case

- In a 4:3 majority decision, the Supreme Court **overturned** its 1967 **Azeez Basha ruling**, which had denied **Aligarh Muslim University (AMU) minority status**, directing that AMU's status be reassessed according to the principles outlined in the current judgment.

## Constitutional Provisions and Historical Background of the case:

- The Aligarh Muslim University (AMU) was founded in **1875** and incorporated by imperial law in **1920**.
- **Article 30 of the Constitution** empowers religious and linguistic minorities to establish and administer educational institutions – AMU had enjoyed minority status.
- A **1951 amendment** to that imperial law, the AMU Act, did away with compulsory religious instructions for Muslim students.
- In India, compulsory religious instruction is prohibited in state-funded educational institutions under **Article 28**. In **S. Azeez Basha vs. Union of India (1967)**, the SC ruled that AMU could not be considered a minority institution, as it was established by a central act, categorizing it as a central university. This ruling denied AMU the rights of minority institutions under **Article 30** of the Indian Constitution.
- In **1981**, an amendment to the **AMU Act** attempted to restore AMU's minority character, aiming to secure rights for it as a minority-administered institution.
- The **Allahabad High Court (2006)** struck down the 1981 amendment, **reinforcing the Supreme Court's earlier ruling** and reasserting that AMU did not qualify as a minority institution.

#### Criteria to assess AMU's minority status

- The SC emphasized that an educational institution must be established by a minority community to qualify for minority status under **Article 30(1)** of the Indian Constitution. This involves examining who initiated the idea of the institution and whether it was primarily intended to **benefit that community**.
- **Holistic Two-Fold Test:** The Court introduced a two-fold test: **First Limb:** Identify the "brain behind" the establishment, which includes reviewing correspondence and documentation that reflect the intentions of the founders. **Second Limb:** Assess whether the administrative structure of the institution affirms its minority character and serves to protect and promote the interests of the minority community.
- **Broad Interpretation of "Established":** The ruling clarified that "established" should be interpreted broadly, meaning that an institution can still be considered a minority institution even if it is governed by a statutory body or has undergone changes in its legal status over time.

#### How does this ruling affect the legal precedent set by the 1967 Azeez Basha case?

- **The overruling of Azeez Basha:** The SC's decision effectively overruled its previous 1967 ruling, which had declared AMU as not being a minority institution because it was established through a government statute rather than directly by a minority community.

- **New Framework for Minority Status:** This ruling marks a shift towards a more inclusive interpretation of what constitutes a minority institution, allowing for a reassessment of AMU's status based on historical context and community intent rather than solely on formal legal definitions.

#### Way forward:

- **Define Minority Status Framework:** Parliament could establish a clear legislative framework based on the Supreme Court's criteria, ensuring consistent and streamlined recognition of minority institutions across India.
- **Balance Autonomy and Accountability:** Policies should support minority institutions' autonomy while maintaining accountability to uphold educational standards, ensuring both community-focused goals and inclusive, high-quality education.

### 11. Pandemic Fund Project : Needs of animal health management

- Recently "Animal Health Security Strengthening in India for Pandemic Preparedness & Response" initiative has been launched by the Indian government under Pandemic Fund Project.

#### Needs of animal health management

- **Public Health Emergencies** - In the past few decades, WHO declared 6 public health emergencies of international concern, and 5 of these have had animal origin.
- **Increasing Zoonosis** - About two-thirds of infectious diseases affecting humans originate from animals.
- **Zoonotic Mortality** - Zoonotic diseases account for more than 1 Billion cases and 1 Million deaths per year.
- **Pandemic Preparedness** - COVID-19 pandemic acknowledged that pandemic preparedness and response (PPR) needs a One Health approach and a focus on animal health security.
- **Protect Livestock Wealth** - 536 million livestock and other animals of India requires measures to prevent and manage infection outbreaks.

#### Pandemic Fund Project

- **Pandemic Fund Project** - The project "Animal Health Security Strengthening in India for Pandemic Preparedness & Response" is launched under the G20 Pandemic Fund .
- **Nodal Ministry** - Union Ministry of Fisheries, Animal Husbandry and Dairying.

- **Objective of the Project** - To enhance the country's capacity to prevent, detect, and respond to animal health threats.
- **Implementation** - It is being implemented through three implementing entities Asian Development Bank (ADB), the World Bank, and the Food and Agriculture Organization (FAO).

### Major interventions under the project

- **Augmentation of Laboratory Systems** - Upgrading and expanding animal health laboratories and developing laboratory networks.
- **Strengthening of Surveillance and Early Warning Systems** - Enhancing early warning systems and building robust sentinel and passive surveillance mechanisms to detect potential outbreaks at an early stage and facilitate timely interventions.
- **Human Resources Development** - Enhance the skills and capabilities of animal health human resources.

### Expected outcomes of the project

- **Outcome** - Impact of the project would be .To reduce the risk of pathogen emergence from animals (domesticated and wildlife).Prent transmission to the human population.
- Endangering the health, nutritional security, and livelihoods of vulnerable populations.
- The project is designed to enhance India's animal health security through the following five key outputs

## 12. India and CARICOM held their second Joint Commission

- **Recently, India and CARICOM held their second Joint Commission meeting, an important event that reviewed and charted the future of their multifaceted relationship.**

### CARICOM

- CARICOM, which stands for **Caribbean Community**, is the oldest surviving integration movement in the developing world.
- It is an organization of Caribbean countries and dependencies originally established as the Caribbean Community and Commons Market in 1973 by the Treaty of Chaguaramas.
- **Main Purposes:**Promote **economic integration** and cooperation among its members;To ensure that the benefits of integration are equitably shared;To coordinate foreign policy;

- **Members:** It has 15 members; Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago. Anguilla, Bermuda, the British Virgin Islands, the Cayman Islands, and the Turks and Caicos Islands have associate member status, and Aruba, Colombia, the Dominican Republic, Mexico, Puerto Rico, and Venezuela **maintain observer status**.
- The Chairmanship of the Community is **rotated every six months** among the member countries' Heads.
- **Secretariat:** The CARICOM Secretariat in Georgetown, Guyana, is the principal administrative organ of the Community and is headed by a Secretary General who is the Chief Executive Officer of the Community.
- In 2007, CARICOM officially inaugurated the **Caribbean Court of Justice (CCJ)**, which serves as the final court of appeal for CARICOM members and also handles regional trade disputes.

### 13. Specific exploitative practices faced by gig workers

- Amid the ongoing evolution of the “gig worker” concept, India recently witnessed a groundbreaking movement a nationwide digital strike organized by women gig workers this Deepavali.
- **Wage Theft and High Commissions:** Many gig workers receive only a fraction of their earnings after substantial deductions for company commissions, which can range from 10% to 35% of their total income. This often leaves them with minimal take-home pay, insufficient to meet basic living expenses.
- **Forced Purchases and Costs:** Workers are often required to buy product kits at full retail prices from their employers, which further erodes their earnings. This practice restricts their ability to purchase necessary supplies at more affordable wholesale rates.
- **Job Insecurity and Rating Systems:** Gig workers are subjected to biased rating systems that can lead to job insecurity. If they refuse “auto-assigned” jobs or fail to meet performance metrics, they risk being blocked from the platform or terminated without recourse.
- **Lack of Social Security:** Gig workers are excluded from essential benefits such as minimum wages, health protections, and social security rights, leaving them vulnerable in times of need.

### Platform dynamics contribute to labour exploitation

- **Misclassification of Workers:** Gig workers are often classified as independent contractors rather than employees, which denies them access to fundamental labour rights and protections. This legal loophole allows companies to evade responsibilities related to wages and benefits.

- **Algorithmic Control:** Companies utilize complex algorithms to manage worker assignments and ratings, creating a system where workers are constantly monitored and evaluated based on performance metrics that may not accurately reflect their work quality.
- **Patriarchal Structures:** The gig economy perpetuates existing patriarchal norms by relegating women to traditionally female roles such as beauticians and housekeepers, limiting their job options and negotiating power within the labour market.

### (Way forward)

- **Legal Recognition as Employees:** Governments should legislate the recognition of gig workers as employees rather than independent contractors, thereby extending labour rights such as minimum wage laws and social security benefits.
- **Regulatory Frameworks:** Establishing comprehensive labour laws specific to the gig economy would help protect workers' rights. This includes mechanisms for grievance redressal, ensuring fair treatment and accountability from platform companies.
- **Collective Bargaining Rights:** Supporting unionization efforts like those of the Gig and Platform Services Workers Union (GIPSWU) can empower workers to negotiate better wages and working conditions collectively. This grassroots organizing is crucial for achieving meaningful change in labour practices within the sector.

### 14. Objectives of Kayakalp Scheme

- **The Rajasthan College Education Commissionerate has directed 20 government colleges to get the front facade of their buildings and entry halls painted orange under the Kayakalp Scheme.**

#### Kayakalp Scheme:

- It is an initiative launched by the **Ministry of Health and Family Welfare (MoHFW)** on May 15, 2015, under **Swachh Bharat Abhiyan** to **promote cleanliness** and enhance the **quality of healthcare facilities in India.**
- **Objectives:** To **promote cleanliness, hygiene, infection control,** and environment-friendly practices in **Public Health Facilities (PHFs).** To **incentivise and recognise PHFs** that show exemplary performance in adhering to standard cleanliness and infection control protocols. To inculcate a culture of ongoing **assessment and peer review of performance** related to hygiene, cleanliness, and sanitation. To **create and share sustainable practices** related to improved cleanliness in PHFs **linked to positive health outcomes.**



- The Kayakalp assessment is a **three-tier process** involving **internal, peer, and external assessment**. At the beginning of each financial year, a health facility is assessed, scored, and documented using the pre-defined assessment tool.
- The **parameters** on which the performance of the facility would be judged are as follows:
  - Hospital/Facility Upkeep
  - Sanitation and Hygiene
  - Waste Management
  - Infection Control
  - Support Services
  - Hygiene Promotion
- To appreciate the hard work and dedication of the healthcare centres, **five awards are provided** under this scheme:
  - **Two best district hospitals.**
  - **Two best community health centres** or sub-district hospitals
  - **One primary health centre in every district.**
- **Cash awards and citations** are provided to the winners judged by the set criteria.

### **15. India should be a part of the Regional Comprehensive Economic Partnership : Niti Aayog CEO**

- India should be a part of the Regional Comprehensive Economic Partnership and Comprehensive and Progressive Agreement for Trans-Pacific Partnership, Niti Aayog CEO BVR Subrahmanyam said recently.
- Subrahmanyam emphasised that India will have to get into the global value supply chain as 70 per cent of the world's trade happens through the global supply chain.

#### **Key takeaways**

- The Regional Comprehensive Economic Partnership (RCEP) is a significant free trade agreement among 15 Asia-Pacific nations: Australia, Brunei, Cambodia, China, Indonesia, Japan, South Korea, Laos, Malaysia, Myanmar, New Zealand, the Philippines, Singapore, Thailand, and Vietnam.
- Collectively, these countries account for approximately 30% of the world's GDP, trade, and population, making RCEP the largest trading bloc globally.

#### **Key Features of RCEP:**

- **Trade Liberalization:** RCEP aims to reduce tariffs and non-tariff barriers, facilitating smoother trade flows among member countries.

- **Market Access:** The agreement enhances market access for goods and services, promoting increased economic integration in the region.
- **Investment Opportunities:** By creating a more predictable and transparent investment environment, RCEP encourages cross-border investments among member states.
- **Economic Cooperation:** The partnership fosters collaboration in areas such as intellectual property, e-commerce, and competition policy, aiming to harmonize standards and regulations.

### India's Position on RCEP:

- Initially, India participated in RCEP negotiations but decided to withdraw in 2019, citing concerns over trade deficits and the potential impact on domestic industries. Despite its absence, RCEP remains open to India's future participation, should it choose to reconsider its position.

### 16. Acute Famine Conditions in Rakhine

- The **United Nations Development Program (UNDP)** has warned that **Myanmar's Rakhine state**, home to the **Rohingya minority**, is on the brink of an **acute famine** due to a combination of internal conflicts, economic collapse, and **natural disasters**.
- **Key factors for Acute Famine:** Blockades restricting goods, **hyperinflation**, lack of income, reduced food production, absence of essential services.
- Predictions suggest domestic food production will cover only **20% of Rakhine's needs by March-April 2025**. Over 2 million people are at risk of starvation by March-April 2025 due to declining domestic food production. The military-led government has limited humanitarian aid access, further exacerbating the crisis.
- Rakhine, the **westernmost state in Myanmar**, is one of the poorest regions, facing ongoing conflict, displacement, and poverty. For decades, the **Rohingya, a Muslim ethnic minority in Myanmar**, have faced discrimination and exclusionary citizenship laws, leading to hundreds of thousands fleeing persecution. In 2017, India signed a development program to help **Myanmar build housing infrastructure for displaced persons** in Rakhine State.
- UNDP was established in 1965 by the **United Nations**, aims to eliminate **poverty** and promote **sustainable development**, democratic governance, and climate resilience.

### 17. Advantages of using Aadhaar in forensic

- Recent discussions about using Aadhaar biometrics data to identify unknown dead bodies.

### Challenges in finding identity with the current system

- **Limited Records** - Fingerprint databases for police investigations are often limited to the records of those with known criminal histories.
- **Inadequate Digitization** - In many States, these records are not yet digitized, making it even more difficult to cross-reference data quickly and efficiently.
- **Under Reporting** - Many of the missing person cases are not registered with police, thus making it difficult to identify the person.
- **Inadequate Evidences** - Victims of hit-and-run accidents without identification documents or mobile phones, or those with mental health issues and travelling to unfamiliar places.

### Advantages of using Aadhaar in forensic

- **Identification of deceased individuals** - Identification of unclaimed or unidentified bodies who are mostly migrant workers, homeless individuals.
- **Finding Missing Person** - Identifying missing or trafficked children, persons with mental health issues traffic.
- **Right to Life and Dignity** - Faster recognition of a deceased person enables for respectful final rites and closure for families.
- **Effective Crime Investigation** - Access to fingerprint data can offer essential scientific support to an investigation.
- **Enhancing Criminal Justice** - Effective investigation enhances the criminal justice system.
- **Uphold Public Safety** - Crime reduction using Aadhaar improves public safety and reduces crime rate.

### Limitations in using the Aadhaar in forensic

- **Privacy Protection** - UIDAI takes privacy seriously, enforcing strict guidelines to protect individuals' demographic and biometric information.
- **Biometric Prohibition** - Section 33 of Aadhaar Act prohibits sharing of "core biometric information", which includes fingerprints and iris scans, with anyone for any reason.
- **Restriction in Access** - Section 33(1) of the Aadhaar Act allows the disclosure of certain information under an order of a court not inferior to that of a High Court judge.
- **Right to Privacy** - Supreme Court Judgement in Justice Puttaswamy case held Right to Privacy as a fundamental right protected under Article 21.
- **Data Privacy Law** - Digital Personal Data Protection (DPDP) Act, 2023 protects the personal identity data of citizens.

### Way forward

- Re-evaluating privacy restrictions in Aadhaar Act on specific contexts, such as identifying a deceased person.
- Providing the police with access to a deceased person's core biometric information, strictly based on a first information report (FIR).
- Enabling jurisdictional judicial magistrate to authorize the data access instead of High court judges to reduce the burden on the higher judiciary in cases not involving violations of privacy.
- Similar provisions might be adopted in India to ease identification challenges without compromising privacy. Implementing legal and ethical guidelines with transparency can ensure Aadhaar's continued relevance and secure its place as a trustworthy public utility.

## 18. Causes of Antimicrobial Resistance and India's approach

- Antimicrobial Resistance (AMR) poses a grave threat to human, animal, and environmental health worldwide, including India. Despite advancements in medical sciences, AMR challenges global health progress, with projections of 10 million deaths annually by 2050.

### AMR

- **Definition:** AMR occurs when microorganisms such as bacteria, viruses, fungi, and parasites evolve to resist antimicrobial drugs, rendering them ineffective. **Impact:** AMR complicates treatments, increases healthcare costs, prolongs illnesses, and risks lives globally.

### Causes of AMR:

- **Overuse of Antibiotics:** Unregulated sale and over-the-counter availability of antibiotics. Over-prescription for minor or non-bacterial infections.
- **Underuse or Misuse:** Non-adherence to prescribed dosages or courses.
- **Industrial Agriculture Practices:** Antibiotics used as growth promoters in livestock, fisheries, and poultry. Poor waste management from farms increases AMR in the environment.
- **Lack of Diagnostic Infrastructure:** Inadequate facilities for proper disease diagnosis and treatment.
- **Inadequate Training:** Healthcare providers often lack awareness of rational antibiotic use.
- **COVID-19 Pandemic Misuse:** Rampant and indiscriminate use of antibiotics during the pandemic exacerbated AMR.

### India's Approach to AMR:

- **National Action Plan (NAP)**: Launched in 2017, it focuses on rational antibiotic use and AMR surveillance.
- **AMR Surveillance and Research Network (AMRSN)**: Established by ICMR in 2013, monitoring resistance patterns across 30 tertiary hospitals.
- **One Health Approach**: Focus on interconnected health across human, animal, and environmental sectors. Collaborative initiatives like Integrated One Health Surveillance Network.
- **National One Health Mission**: Approved in 2022, it targets AMR, zoonotic diseases, and environmental health.
- **Policy Guidelines**: NCDC developed national guidelines for treatment and infection control.
- **Zoonotic Disease Programmes**: National Programme for Prevention and Control of Zoonoses under One Health.

### Challenges yet to be addressed:

- **Lack of behavioural and social science data**: Limited understanding of community-level antibiotic usage patterns. **Structural disparities**: Unequal access to healthcare, particularly in rural and underserved regions.
- **Insufficient community engagement**: Poor implementation of awareness campaigns and behavioural change initiatives.
- **Inadequate workforce training**: Outdated curricula and lack of inter-sectoral training for professionals.
- **Surveillance gaps**: Inconsistent data collection from community and tertiary levels.

### Way ahead:

- **Strengthen surveillance systems**: Expand monitoring to include community-level data for better health planning.
- **Enhance public awareness**: Implement targeted campaigns on antibiotic stewardship and AMR risks.
- **Policy implementation**: Enforce stricter regulations on over-the-counter antibiotic sales.
- **Inter-sectoral collaboration**: Strengthen the One Health approach across human, animal, and environmental sectors.
- **Update curricula and training**: Regularly revise professional training to include AMR and integrated health strategies.
- **Focus on resource allocation**: Ensure equitable distribution of resources for implementing AMR strategies effectively.

### Conclusion

- Addressing AMR is critical for sustaining global health progress and achieving SDG targets. India's initiatives, including the One Health Mission and AMR surveillance, provide a robust foundation. However, success requires bridging regulatory, social, and infrastructural gaps through a collaborative, multi-sectoral approach that ensures equitable healthcare for all.

## 19. Role of One Health Approach for Antimicrobial Resistance

- Recently United Nations General Assembly held a high-level meeting on AMR emphasizing prevention.

### Anti-microbial resistance

- **Antimicrobial** - It is a drug designed to treat and prevent infectious diseases in humans, animals, and plants. Antimicrobials include antibiotics, antivirals, antifungals, and antiparasitic.
- **Antimicrobial Resistance** - AMR is a natural process that happens over time through genetic changes in pathogens and it no longer respond to anti microbials.
- It is further accelerated by human activity, mainly the misuse and overuse of antimicrobials to treat, prevent or control infections in humans, animals and plants.
- **Global Concern** - Antimicrobial medicines are the cornerstone of modern medicine.

### Challenges in fighting AMR

- **Fragmented Policy Responses** - India's regulatory oversight of antibiotic use spans across multiple departments in the ministries of health and family welfare, agriculture and environment.
- **Limited Data** - The absence of a centralised, cross-sectoral data repository hinders comprehensive policy development and effective monitoring affects AMR surveillance.
- **Inadequate AMR Training** - Many professionals lack essential training to manage AMR effectively in healthcare and veterinary hospitals.
- **Over Prescription of Antibiotics** - Frequent, unnecessary antibiotic prescriptions heighten resistance risks, particularly in underserved rural areas.
- **Self-Medication Practices** - People often use antibiotics without prescriptions, worsening resistance due to improper dosing and usage.

### Role of one health in fighting AMR

- One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.
- **Integrated Disease Surveillance** – Disease monitoring across human, animal, and environmental sectors helps to address communicable diseases of zoonotic, transboundary animal diseases and diseases of epidemic/pandemic potential.
- **Environmental Surveillance System** – To understand the disease transmission dynamics across human, animal husbandry and wildlife.
- **Behavioral Changes** – Responsible use of antibiotics at the grassroots level could foster a shift toward preventive healthcare.
- **Sustainable Waste Management** – Green practices for waste management, particularly pharmaceutical waste, can minimize environmental AMR contamination.

### Way forward

- Harmonising regulations and fostering inter-departmental collaboration are critical to developing a coherent AMR strategy.
- Establishing stringent guidelines and policies for veterinary and agricultural use of antibiotics is crucial for addressing AMR.
- Awareness programmes and strict prescription regulations are necessary to curb misuse at the community level.

### 20. Current challenges facing the IMEC initiative

- The India-Middle East-Europe Corridor (IMEC), announced at the 2023 G20 summit, aims to cut travel time by 40% and costs by 30%, which could transform global shipping once it's up and running.

#### (India-Middle East-Europe Corridor)

- The **IMEC (India-Middle East-Europe Corridor)** is a major trade route connecting India, the Middle East, and Europe to reduce transit times and transportation costs, launched in 2023 during the G20 Summit.

- It **aims** to strengthen regional partnerships through improved infrastructure, energy grids, and digital connectivity, providing an alternative to traditional maritime routes like the Suez Canal.

### Current challenges facing the IMEC initiative

- **Geopolitical Tensions:** The Israel-Palestine conflict, which escalated in October 2023, has stalled progress on the IMEC's western segment, with Saudi Arabia and Jordan delaying collaboration due to potential geopolitical and optics issues related to their interactions with Israel.
- **Lack of Progress in West Asia:** Due to the conflict, connectivity efforts in West Asia are moving slowly, affecting the northern part of the corridor, particularly the integration of infrastructure and trade processes with Israel and other stakeholders.
- **Incomplete Development of Additional Infrastructure:** Beyond basic connectivity, elements such as clean energy exports, undersea fiber-optic cables, and telecommunication linkages are delayed and are expected to proceed only once stability is restored in West Asia.
- **Organizational and Logistical Framework:** The absence of a central governing structure, like an IMEC secretariat, hinders streamlined cross-border trade processes and systematic project implementation, leading to coordination challenges among participating nations.

### How IMEC Aims to Enhance Regional Cooperation and Economic Growth?

- **Strengthening India-UAE Economic Relations:** India and the UAE are advancing bilateral trade, leveraging frameworks like the Comprehensive Economic Partnership Agreement (CEPA) and the Virtual Trade Corridor to standardize trade processes, reduce costs, and simplify logistics.
- **Improving Connectivity in the East:** Progress on the eastern segment, particularly between India and UAE, is increasing trade and setting a foundation for cooperation through standardized trade practices and growing non-oil trade, which diversifies exports and enhances India's regional integration.

### Implications of IMEC for global trade dynamics

- **Reduced Dependency on the Suez Canal:** IMEC offers a strategic alternative to the Suez Canal, with an anticipated reduction in transit time by 40% and costs by 30%, which could significantly impact global trade routes by diversifying options and lowering shipping times and expenses.
- **India's Role as a Supply Chain Alternative:** By leveraging IMEC, India can enhance its position in global value chains as an alternative supply chain hub,



aligning with its manufacturing ambitions and increasing export competitiveness through improved infrastructure and reduced logistics costs.

- **Reshaping Trade Infrastructure:** The project introduces a new corridor that supports not only connectivity but also potentially includes energy infrastructure and digital linkages, providing a comprehensive trade infrastructure model that could influence future trade frameworks in the Indo-Pacific and beyond.
- **Attracting Participation:** The IMEC secretariat, once established, could guide strategic decision-making, build empirical support for trade benefits, and encourage more countries to join the corridor, potentially expanding IMEC's impact on international trade and cooperation in regions connected to it.

### Way forward:

- **Strengthen Geopolitical Stability:** Address regional tensions, especially in West Asia, to ensure smoother collaboration among stakeholders and accelerate the development of the western segment of the IMEC.
- **Develop an IMEC Secretariat:** Establish a central coordinating body to streamline operations, facilitate cross-border trade, and guide infrastructure projects, ensuring systematic progress and attracting further global participation.

## 21. World Intellectual Property Indicators

- **The World Intellectual Property Organization (WIPO) has published the World Intellectual Property Indicators (WIPI) 2024, underscoring global trends in intellectual property (IP) filings. The report reveals significant growth in patent, trademark, and industrial design applications across top economies.**

### Highlights of the report

- India has secured a spot in the global top 10 for all three major intellectual property (IP) rights – patents, trademarks, and industrial designs.
- India recorded the fastest growth in patent (+15.7%) applications in 2023 among the top 20 origins, marking the fifth consecutive year of double-digit growth.
- India ranks sixth globally for patents with 64,480 applications, with resident filings accounting for over half of all submissions (55.2%) – a first for the country.
- The report indicates a steady rise (36.4%) in India's industrial design applications, which aligns with increasing emphasis on product design, manufacturing, and creative industries within India.

- The top three sectors – **Textiles and Accessories, Tools and Machines, and Health and Cosmetics** – made up almost half of all design filings,
- Between 2018 and 2023, patent and **industrial design** applications **more than doubled**.
- India's **patent-to-GDP ratio** also saw **significant growth**, rising from 144 to 381 in the past decade, indicating that IP activity is scaling alongside economic expansion.
- India ranked **fourth globally in trademark filings**, with a 6.1% increase in 2023. Nearly 90% of these filings were by residents, with key sectors including Health (21.9%), Agriculture (15.3%), and Clothing (12.8%) leading the way.
- India's **trademark office holds the second-largest number** of active registrations worldwide, with over 3.2 million trademarks in force, reflecting the country's strong position in global brand protection.
- Key findings show a record of 3.55 million patent applications filed worldwide in 2023, up 2.7% from 2022 with notable contributions from leading economies in Asia. This increase was largely driven by residents in China, the United States, Japan, South Korea, and India.

## 22. Significances of the Aligarh Muslim University Judgement

- The recent judgement by the 7-judge bench of Supreme Court on AMU case redefined minority rights and laid down a holistic test to determine the 'minority character' of an educational institution.

### Background of the case

- **Mohammedan Anglo-Oriental College** - In 1875, Sir Syed Ahmad Khan founded the Muhammadan Anglo-Oriental (MAO) College in Aligarh, Uttar Pradesh.
- The college was designed after the British educational system, with the goal of integrating Western science and literature with Islamic subjects.
- **University status** - The Aligarh Muslim University Act, 1920 by the Indian Parliament, elevated the MAO College to the status of a Aligarh Muslim University (AMU).
- **The 1951 amendment** - It took away compulsory religious instructions for Muslim students at the AMU.
- **S. Azeez Basha v Union of India case (1967)** - The judgement took away the minority status of the AMU In 1967 stating that AMU was neither established nor administered by the Muslim minority.
- **Removal of minority status** - Allahabad High Court judgement (2006) struck down both 50% reservation for Muslim and the **AMU Amendment Act (1981)**

- **Appeal** - Government filed the appeal before the Supreme Court against the 2006 verdict of the Allahabad High Court.
- **Constitution bench** - Following this, the Supreme Court constituted a seven-member Bench to deal with a reference arising out of the 2006 order passed by the Allahabad High Court.

### **Significances of the supreme court judgement**

- **Overturms Azeez Basha case judgment** - New Judgement held that Statutory recognition to a minority institution doesn't remove it's minority status.
- **Purpose** - While the purpose of establishing a minority institution should be the conservation of language and culture, it need not be the only purpose.
- **Admission** - A minority institution will not lose its minority character by admitting students belonging to non-minorities.
- **Administration** - The administration of an minority educational institution does not need to be handled by the minority community.
- Its administration must reflect a commitment to protecting and promoting minority interests.
- **Education** - Secular education can be imparted at a minority institution without affecting its minority character.

### **Constitutional tests to determine the minority status**

- **Genesis** - Trace the origin of the idea for the establishment of the institution to determine the brain behind the establishment.
- For proof, a variety of sources could be considered – letters, correspondence with other community members or government officials, etc.
- The link must point towards one member of the minority or a group from the community.
- **Purpose** - It must “predominantly” be for the benefit of the minority community, even if it is not the sole purpose.
- **Implementation** - Examining the source of funding, land donations and constructors of the infrastructure.

### **23. Specific benefits of PMUY in Jammu and Kashmir**

- The International Energy Agency reports that 681 million people in India rely on solid fuels for cooking, causing health and environmental concerns. The Pradhan Mantri Ujjwala Yojana (PMUY) provides subsidized LPG connections to promote clean fuel adoption in Jammu and Kashmir.
- The Pradhan Mantri Ujjwala Yojana (PMUY) is a government scheme aimed at providing subsidized LPG connections to poor households, promoting

clean cooking fuel, improving health, and reducing dependence on solid fuels.

### **What specific benefits has the PMUY provided to households in Jammu and Kashmir?**

- **Increased LPG Adoption:** The PMUY scheme has significantly increased the availability of LPG in rural areas of Jammu and Kashmir. Around 85.07% of households in rural areas now have official LPG connections, with 68% of them having obtained these connections through PMUY.
- **Health Benefits:** PMUY adoption has led to a marked reduction in respiratory problems, such as coughing, chest infections, and headaches, particularly among BPL and AAY households. Health improvements were more prominent in households with additional appliances like rice cookers and those with educated members.
- **Reduction in Solid Fuel Usage:** Although not completely eliminating the use of traditional fuels, the scheme has led to moderate reductions in the reliance on solid fuels like firewood. The average consumption of firewood per household was 226 kilograms over six months.
- **Cultural and Health Improvements:** For households that adopted LPG under PMUY, there was a noticeable reduction in indoor smoke exposure, leading to better health outcomes, especially for women who were primarily responsible for cooking.

### **How has the implementation of PMUY addressed local challenges related to fuel availability and usage?**

- **Enhanced Fuel Access:** PMUY has addressed the issue of limited access to clean cooking fuel in rural areas by providing subsidized LPG connections. This has significantly reduced the reliance on harmful solid fuels, such as firewood, in many areas, particularly those with difficult topography like Rajouri.
- **Dual-Fuel Usage and Financial Barriers:** Despite increased LPG adoption, 85% of households still practice fuel stacking, using both LPG and traditional fuels. This is largely due to the high cost of refilling LPG cylinders. The scheme has not entirely solved financial barriers, which continue to force households to rely on cheaper, polluting fuels.
- **Awareness and Education Gaps:** One of the key challenges to exclusive LPG use is the lack of awareness about its health benefits. Nearly half of the surveyed households were unaware of the risks associated with solid fuel use. This barrier has been compounded by limited access to communication devices, such as televisions and mobile phones, particularly for women who are the primary cooks.

- **Cultural Attachment to Traditional Cooking Methods:** Despite the availability of LPG, traditional cooking methods (e.g., chulhas) continue to persist in the region due to cultural attachment. This presents a challenge in transitioning entirely to clean cooking fuels. However, the study found that households with educated members and modern appliances like rice cookers were more likely to use LPG exclusively.

#### Way forward:

- **Targeted Awareness Campaigns:** Launch region-specific awareness programs, particularly for women, highlighting the health benefits of LPG and addressing misconceptions, while utilizing mobile and community outreach for wider reach.
- **Financial Support for LPG Refills:** Introduce subsidies or microfinance schemes to ease the financial burden of LPG refills, encouraging exclusive use of clean fuels and reducing reliance on harmful solid fuels.

#### 24. Key takeaways of New Water Act Rules

- The Union Environment Ministry notified new rules for holding inquiry and imposing penalties for violations of the Water (Prevention and Control of Pollution) Act. The new Rules – Water (Prevention and Control of Pollution) (Manner of Holding Inquiry and Imposition of Penalty) rules, 2024, will come into effect immediately.

#### Key takeaways

- The Rules come in the backdrop of the amendments made to the Water Act earlier this year, wherein offences and violations of the Act were decriminalised, replacing them with penalties instead.
- The amendments had also allowed the Centre to appoint officers to adjudicate offences, and violations and determine penalties.
- According to the Rules, the adjudication officer then has powers to issue notice to persons against whom complaints have been filed, detailing the nature of contravention alleged or committed.
- The adjudication office then considers the explanation provided and if needed, holds an inquiry into the complaint.
- The alleged violator could defend themselves or through a legal representative. The whole process has to be completed within six months from issuance of notice to the opposite party, the Rules state.

## 25. Student Direct Stream visa

- **Canada has discontinued** the Student Direct Stream (SDS), ending faster processing for students from specific countries, including India.

### Student Direct Stream (SDS) Visa

- The **SDS** is a **fast-track visa processing program** introduced by **Canada in 2018** to expedite study permits for students from certain countries, including **India**.
- Under SDS, applicants typically experienced processing times of around **20 days**.
- This stream was designed to simplify and speed up the application process for eligible students by requiring **proof of financial stability** (such as a **Guaranteed Investment Certificate**) and specific educational documentation.
- The SDS applied to students from **14 countries**, including: **India, China, Pakistan, Vietnam, Trinidad and Tobago**, among others. Since its launch, **SDS has been popular** among Indian students, with a high approval rate for study permits in recent years.

### Why was SDS discontinued?

- **Fair Access:** Moving to a single, standardized process aims to provide **equal opportunity** for all applicants.
- **Strengthened Protection:** Canada intends to address **student vulnerability** by improving safeguards in its regular process. The changes are part of Canada's broader immigration reforms, which also update **financial requirements** and **study permit caps**.

### How does the discontinuation affect Indian Students?

- Indian students will face: **Longer Processing Times:** Visa approvals may now take longer under the **standard process**. **Additional Financial Proof:** More **financial documentation** will be required. **Post-Graduation Work Permit (PGWP) Changes:** New rules from **November 1, 2024** may impact work options after graduation.

## 26. Audit Report on Implementation of the 74th Constitutional Amendment Act by CAG

- A performance audit report on **implementation of the 74th Constitutional Amendment Act** has been released by the Comptroller and Auditor General

of India (CAG). 74th Constitutional Amendment Act, came into effect in **1993**, it provided a clear mandate for **democratic decentralisation**.

- It created **democracy at the grass root level** through **self-governing local bodies in urban areas**. It empowered Urban Local Bodies (ULBs) to **perform 18 functions as listed in the 12th Schedule of the Constitution**.
- **Audit by CAG:** The **aim of this Audit** was to **ascertain empowerment of ULBs** through devolution of adequate resources for effective discharge of functions, as enshrined in 12th Schedule. The performance audits were conducted **between 2014 and 2021 across 393 urban local bodies in 18 states**.

### Findings of the CAG Report

- **Devolution of Functions:** 17 of the 18 functions were devolved in 18 states, **just 4 functions were effectively devolved with complete autonomy**. 4 functions include burial grounds, public amenities, prevention of cruelty to animals and regulation of slaughter houses. **Only 9 states** (Chhattisgarh, Haryana, Jharkhand, Madhya Pradesh, Maharashtra, Manipur, Odisha, Punjab and Tripura) have devolved all the 18 functions.
- **Concerns about the Fiscal Health of ULBs:** Just 32% of the total revenue of ULBs was their own and the rest was grants from state and central government. There was a 42% gap between revenue resources and expenditure of ULBs in the 18 states.
- **Shortage of Staff:** While the population in cities is rapidly increasing, ULBs in most states don't have sufficient manpower.
- **Reservation for Women:** Six out of the 14 states reserved 50% of their city council seats for women, surpassing the constitutional requirement of 33% reservation for women.
- **Ward Delimitation:** Only 4 of the 15 states, namely Himachal Pradesh, Kerala, Maharashtra and Tamil Nadu have empowered state election commissions with ward delimitation while in the remaining 11, it is vested with the State Government.
- **Direct Elections for Mayor:** Only 5 states (Chhattisgarh, Haryana, Jharkhand, Tamil Nadu and Uttarakhand) have the provision for direct election of mayors.

### Recommendations

- **Changes required:** There is a need to conduct municipal elections every five years, constitute planning committees to control haphazard urbanisation and empower state finance commissions to focus on better fiscal management.
- **Scientific Budget:** Efforts need to be made to motivate the ULBs to prepare their budgets in a scientific manner taking into account realistic projection of funds.

- **Release of Funds:** The State Government should monitor the release of grants to Urban Local Bodies so that allocated grants are released fully and in time.
- **Delegation of Power:** The State Government may consider to delegate adequate powers over manpower resources to Urban Local Bodies in matters such as assessment and recruitment of required staff.

## 27. Principles and features of Constitutional Governance

- November 26 of 2024 year will mark the commemoration of the 75th anniversary of the adoption of the Constitution of India.

### Constitutional governance

- **Constitutional governance** - It refers to the system of government where the powers, functions, and limits of each branch of government are defined by a constitution.
- It is also about permeating a deep sense of constitutional culture that has captured the collective consciousness of Indians across different cultures, faiths and beliefs.
- **Organs of constitutional governance** - Legislature, Executive, and Judiciary
- **Principles and features of constitutional governance**
  - **Rule of law** - All individuals, including government officials, are subject to and accountable under the law.
  - It implies that no individual or institution is above the law.
  - **Democratic accountability** - Every action by the government must conform to the provisions of the Constitution.
  - **Rights and duties** - Citizens are empowered with rights and duties to ensure their active participation in the democratic process.
  - **Checks and balances** - Executive, legislature, and judiciary operate within the bounds of the law.
  - **Separation of powers** - The powers of the government are divided among the legislative, executive, and judicial branches to prevent the abuse of power.
  - **Federalism** - India follows a federal structure with a division of powers between the central and state governments.

### Core constitutional values that shaped India's constitutional culture

- **Faith in democratic process** - Despite numerous political and social challenges, Indian citizens have shown a remarkable commitment to participating in voting in elections.
- Since the first elections in 1951-52, there has been consistent voter turnout, with the 2024 general elections witnessing a **65.79% turnout**.



- **Smooth transition of power** – Regardless of differences, political parties have always respected the people's mandate, ensuring a smooth transition of power after elections.
- **Protection of fundamental rights** – The framers of the Constitution, recognized the importance of safeguarding these rights against any potential misuse of state power.
- Over the years, Indian courts have played a vital role in upholding these rights to ensure that constitution protects citizen.

### Way forward

- Reinforce the core values that have shaped its constitutional culture. Inclusive governance to address India's challenges in the coming decades.
- Strengthen Judiciary by reforms, and recognizing the role of technology in governance. Ensure judicial accountability, and promoting socio-economic rights to achieve a more equitable society.

### 28. Key points of Grievance Redressal Assessment Index

Recently, the union Minister of State (Independent Charge) Science & Technology has launched Grievance Redressal Assessment and Index (GRAI) 2023.

#### Grievance Redressal Assessment And Index:

- It was conceptualized and designed by **the DARPG, Govt. of India** based on the recommendation of the Parliamentary Standing Committee of the Ministry of Personnel, Public Grievances and Pensions.
- **Objective:** It has an objective to present organization-wise comparative pictures and provide valuable insights about strengths and areas of improvement regarding grievance redressal mechanism.
- The **first edition** of GRAI 2022 was released on 21 June 2023.
- Eighty-nine Central Ministries and Departments were assessed and ranked based on a comprehensive index in the dimensions of (1) Efficiency, (2) Feedback, (3) Domain and (4) Organisational Commitment and corresponding 11 indicators.
- To compute the index, data between January and December 2023 was used from the **Centralised Public Grievance Redressal and Management System (CPGRAMS)**.
- Department of Agriculture and Farmers Welfare, O/o the Comptroller & Auditor General of India and Department of Investment & Public Asset Management have topped the rankings in Group A, B and C respectively.

- This report presents a **two-dimensional** (vertical and horizontal) **analysis** of the root causes of effective redressal of grievances of each Ministries and Departments in an easily discernible colour coded analysis.
- The report also presents a brief description of technical partners DARPG has engaged to facilitate the Ministries and Departments to optimally utilize CPGRAMS as a means of effective grievance redressal media.
- This report presents a clear roadmap with an **advisory for the Ministries and Departments** to leverage CPGRAMS and its features like IGMS 2.0, TreeDashboard, etc., to enhance grievance redressal.
- The roadmap for improvement emphasizes integrating **advanced technologies like AI and ML for data analysis**, predictive analytics and preventive measures while revising ATR formats for better reporting.
- Capacity building for GROs, enhancing accountability through audits and extending CPGRAMS integration to the third-tier of government are key recommendations.

## 29. Needs of president rule provisions in Indian context

- Recently, large scale violence has erupted again in Manipur.
- **President's Rule** –It is a provision under Article 356 of the Indian Constitution that allows the central government to assume direct control over a state's governance.
- It also known as State emergency or Constitutional emergency.
- **Origin** - Emergency power of President in present Constitution can be traced from section 93 of the Government of India Act, 1935.
- Government of India Act, 1935 empowered both the Governor General (at the Federal level) and the Governor (at the provincial level) to deal with the failure of the Constitutional machinery.
- **Need of president rule** **Protect unity and integrity of the nation** - Parliamentary democracy is vulnerable to diverse and complex society of India.
- **Address governance breakdown** - Union intervention might be needed to ensure that states adhere to constitutional norms and maintain law and order when required.
- **Strengthen federalism** – To prevent federal units of the union resisting the central government and ensure cooperation among the states.
- **Protect individual's liberty** – when a state's machinery fails, depriving citizens of basic liberties, Union intervention becomes essential to safeguard their rights and restore peace
- **Uphold constitution** – To ensure values and principle of the constitution is respected and obeyed by the states. **Protect states** – To protect states against external aggression and internal disturbance.

## Necessities of president rule in Manipur

- **Breakdown of constitutional machinery** – The government has failed to protect its citizen's basic liberties and maintain law and order.
- **Deprivation of fundamental rights** - 3 million people of Manipur are deprived of fundamental rights and their lives, liberty, dignity, and peace.
- **Judiciary failure** – In spite of Various judicial orders and directives the violence have not been controlled depriving.
- **Failure of governance** – Inability of the state government to control the violence in the state.
- **Internal disturbance** – The violence caused killing of more than 250 people and displacement of over a lakh of people.
- Hundreds of temples, churches, homes and other places have been destroyed.

## Way forward

- Restore governance and protect citizens' rights in the state by curbing the violence.
- The government should act decisively to bring back peace, harmony, justice, relief and rehabilitation.
- Engage both parties to peace talks to stop the violence.

## 30. Modifications in BNSS Regarding Bail & Undertrials

- India's judicial and prison systems face challenges, with undertrial prisoners forming a major portion of inmates. Amendments under the Bharatiya Nagarik Suraksha Sanhita (BNSS) aim to streamline bail and reduce prison overcrowding, reinforcing justice and rights.
- **Definition:** Bail refers to the temporary release of an accused person awaiting trial, often under specified conditions.

## Types of Bail:

- **Regular Bail:** Granted to those in police custody (Sections 437 & 439 of CrPC).
- **Interim Bail:** Temporary relief until a regular or anticipatory bail hearing.
- **Anticipatory Bail:** Pre-arrest bail under Section 438 of CrPC for individuals fearing arrest.

## Modifications in BNSS Regarding Bail:

- **First-Time Offenders:** Entitled to bail after serving one-third of their maximum sentence (excluding cases with life imprisonment or death penalties).
- **Mandatory Bail:** Courts must consider bail upon charge sheet filing unless there are compelling reasons to deny it.
- **Special Provisions:** Focus on vulnerable groups like women, children, and sick individuals.
- **Timely Disposal:** Emphasis on reducing delays in bail application processes.

### Recent Trends in Undertrial Prisoners in India:

- **Population Statistics:** As of 2022, undertrials constitute 75.8% of the prison population (4,34,302 out of 5,73,220 prisoners).
- **Gender Analysis:** 76.33% of incarcerated women are undertrials.
- **Duration:** 8.6% of undertrials have been imprisoned for over three years.

### Key Supreme Court Judgments on Bail:

1. **Satender Kumar Antil vs. CBI (2023):** Established guidelines for timely disposal of bail applications and emphasized “bail, not jail.”
2. **Hussainara Khatoon vs. State of Bihar (1979):** Ensured the right to free legal aid for fair trials.
3. **Charles Sobhraj vs. Superintendent, Central Jail, Tihar (1978):** Highlighted prisoner rights, including access to humane living conditions.
4. **Shaheen Welfare Association vs. Union of India (1996):** Allowed bail for undertrials with prolonged detention exceeding two years.
5. **Upendra Baxi vs. State of U.P. (1983):** Stressed dignity and humane treatment for inmates

### Challenges:

- **Implementation Gaps:** Delayed compliance with bail conditions despite legal provisions.
- **Economic Barriers:** Inability to afford bail amounts or arrange sureties.
- **Judicial Discretion:** Inconsistent application of bail principles across cases.
- **Administrative Delays:** Prolonged processing time for bail applications.
- **Documentation Issues:** Lack of identity proof and legal representation hampers undertrial release.
- **Social Barriers:** Marginalized individuals face systemic biases in accessing bail.

### Measures:

- **Reform Legislation:** Develop comprehensive laws to streamline bail processes.
- **Focus on Rehabilitation:** Implement programs to support reintegration and reduce recidivism.
- **Open Prison Models:** Expand systems like Rajasthan's "open prisons" for eligible inmates.
- **Strengthen Legal Aid:** Enhance access to legal aid services for undertrials.
- **Streamline Processes:** Ensure jail superintendents promptly notify courts about eligible undertrials.
- **Political Will:** Prioritize reforms with sustained funding and commitment.

## GS 3 : Economy, Science and Technology, Environment

### 1. Strategy of Gold Reserves

- India's gold reserves currently total 854.73 metric tonnes, according to a recent Reserve Bank of India (RBI) report.
- Of this, 510.46 metric tonnes are held within the country, while 324.01 metric tonnes are stored with the Bank of England and the Bank for International Settlements (BIS). Gold now makes up **9.32% of India's total foreign exchange reserves**, a rise from 8.15% in March 2024.
- On a global scale, **India ranks 8th for gold reserves**. The top-ranking countries are the United States, Germany, and Italy, with the U.S. holding nearly as much gold as the combined reserves of Germany, Italy, and France.

#### Gold Reserves

- Gold has **lower co-relation with other asset classes** and, therefore, provides a **safety cushion** during periods of geopolitical stress and prevailing economic uncertainty and/or downturn in markets.
- **Prices of gold are** suggested to hold an **inverse relationship with interest rates**.
- When interest rates are tightened gold becomes less attractive to investors as they do not offer any yield. Conversely, lower interest rates coupled by a weaker dollar can prompt investors to also opt for the safety bullion cushion.
- **Central banks accumulate gold for several reasons:**
  - **Monetary Stability:** Gold provides a store of value and is often used as a safeguard against economic uncertainty.
  - **Currency Support:** Gold reserves enhance a nation's currency credibility, as it is seen as a backing for the currency's value.
  - **Investment Diversification:** Holding gold diversify a central bank's assets, reducing risk in their investment portfolios.

- **International Trade and Payments:** Gold reserves facilitate international trade and payments, serving as a universally accepted form of currency.
- Countries with significant gold reserves include the **United States, Germany, Italy, and France.**

### Gold Reserves Strategy

- The RBI continues to retain 324 tonnes of its gold reserves under the protection of the **Bank of England and the Bank for International Settlements**, which collectively hold a substantial portion of India's gold abroad.
- **The Bank of England**, established in **1697**, is renowned for its extensive gold storage facilities and remains the world's second-largest gold custodian after the New York Federal Reserve.
  - Storing part of India's gold in London provides the RBI with **immediate access to the London bullion market**, allowing for enhanced liquidity.

### 2. Key takeaways of Green Firecrackers

- Delhi earned the tag of the world's most polluted city on Friday after firecrackers were burst on the occasion of Diwali on Thursday despite a blanket ban in the national capital.
- At 6 am on Friday, the Air Quality Index (AQI) was recorded at 359, which falls in 'very poor' category, according to CPCB.

### Key takeaways

- Green crackers are eco-friendly fireworks developed as a solution to the air and noise pollution caused by traditional firecrackers. They are designed to emit fewer pollutants and are developed with an emphasis on reducing the harmful effects of conventional crackers.
- Both green crackers and traditional crackers cause pollution. However, the difference is that green crackers cause 30 per cent less air pollution as compared to traditional ones.
- Green crackers do not contain harmful chemicals like arsenic, lithium, or barium, which are found in conventional firecrackers and are responsible for high emissions of sulfur oxides, nitrogen oxides, and particulate matter.
- Use of alternative chemicals and a reduced level of aluminum, which cuts down on the emission of particulate matter (PM).

- The Council of Scientific and Industrial Research (CSIR) has developed 'green firecrackers' to combat pollution.
- According to the CSIR-National Environmental Engineering Research Institute, green crackers must have a reduction in the size of the shell, elimination of ash usage, reduced usage of raw materials in the composition, and/or use of additives as dust suppressants to reduce particulate matter, SO<sub>2</sub>, and NO<sub>2</sub> emissions.
- These 'green firecrackers' have types like SWAS (safe water releaser), SAFAL (safe minimal aluminium), and STAR (safe thermite cracker).
- SWAS is a safe water releaser, which suppresses the dust released by releasing water vapour in the air. It does not comprise potassium nitrate and sulphur and the particulate dust released will reduce approximately by 30 per cent.

### 3. Insights and Urgent Reforms Needed for COP16

- At a recent press conference involving major coalitions like the **Forests and Finance Coalition** and the **Articulation of Indigenous Peoples of Brazil (APIB)**, experts emphasized the need to align global financial flows with biodiversity goals.
- They highlighted critical issues addressed in two new reports, "**Banking on Biodiversity Collapse**" and "**Regulating Finance for Biodiversity.**" This discussion underscores the necessity for financial regulations to support the **Global Biodiversity Framework (GBF) ahead of the upcoming COP16 summit.**

#### Financial Investments and Biodiversity:

- In 2023, investments in environmentally harmful sectors amounted to **\$7 trillion**, starkly contrasting with only **\$200 billion** directed toward biodiversity conservation and restoration. This disparity highlights a critical gap in financial sector accountability and underscores the need for more stringent regulatory oversight.
- Reports analysed activities of major financial institutions across key regions, including **Brazil, Indonesia, China, the EU, and the U.S.** Since the Paris Agreement, financial institutions have invested nearly **\$400 billion** in companies that threaten tropical forests, emphasizing the failure of voluntary industry policies to prevent deforestation and human rights violations.

#### Global Biodiversity Framework (GBF):

- The GBF was adopted during the fifteenth Conference of the Parties (COP15) to the Convention on Biological Diversity (CBD) following a four-year negotiation process.
- The framework aims to achieve a world living in harmony with nature by 2050, supporting the Sustainable Development Goals (SDGs) and building on the CBD's previous Strategic Plans.
- **30 by 30 Target;** Protect 30% of Earth's land and marine areas by 2030 to safeguard biodiversity, ecosystems, and ecosystem services.
- **Main Targets for 2030:** The GBF outlines **four goals for 2050** and **23 targets for 2030** to reverse biodiversity loss and promote sustainable practices.

#### Four Key Goals by 2050:

1. **Protect biodiversity and restore degraded ecosystems** to maintain essential ecosystem services. Emphasize critical habitats and biodiversity hotspots.
2. Ensure biodiversity is used sustainably, **maintaining ecosystems' ability to regenerate** and support diverse life forms.
3. Promote the **fair distribution of benefits** from genetic resources, especially to Indigenous and local communities.
4. **Foster change across sectors (e.g., agriculture, forestry, fisheries) for sustainable development.** Integrate biodiversity into policy-making, planning, and economic decisions.

#### Key Biodiversity-related reports highlighting the role of financial institutions:

- **Banking on Biodiversity Collapse:** Released by the **Forests & Finance Coalition** in collaboration with organizations like the **Rainforest Action Network (RAN)**, this report addresses the impact of financial institutions on deforestation and biodiversity loss.
- It details how banks and investors continue to fund industries linked to high-risk commodities (e.g., beef, palm oil) that drive deforestation, particularly in tropical regions. The report calls for stronger regulatory measures to mitigate biodiversity threats linked to financial activities.

#### 4. Key Facts of Tiger Translocation for Genetic Diversity

- Recently, the **Odisha** government translocated a **tigress named Jamuna** from **Tadoba Andhari Tiger Reserve** in Maharashtra to the **Similipal Tiger Reserve (STR)** in Odisha.
- Translocation was aimed at **enhancing genetic diversity** in Similipal, where there are concerns about **inbreeding** due to a **small population**.



### Key Facts About this Translocation

- **Previous Translocation Attempts:** In 2018, a tigress named **Sundari** was relocated to **Satkosia Tiger Reserve, Odisha**. The **National Tiger Conservation Authority (NTCA)** gives approval for the translocation project.
- **Translocation of Black Tigers:**
  - **Population:** The Odisha Tiger Estimation conducted in **2024** found a total **24 adult tigers** in Similipal, with a notable presence of **pseudo-melanistic tigers**. STR is the **only habitat** where these **black tigers** are found in the wild.
  - **Inbreeding Concerns:** The high number of **pseudo-melanistic tigers (13 out of 24 adults)** in Similipal raises concerns about **inbreeding and lack of genetic flow**, prompting the need for **external genetic input**.
  - **Future Initiatives:** Plans are in place to establish a **melanistic tiger safari in Similipal**, which would be the first of its kind in the world.

### Key Facts About Similipal Tiger Reserve

- **Location:** Similipal tiger reserve and national park is located in **Odisha's Mayurbhanj district**. It was designated as a **tiger reserve** under **Project Tiger** in 1973. In 2009, **UNESCO** included **Simlipal National Park** in its list of **Biosphere Reserve**.
- **Geography:** **Joranda and Barehipani waterfalls** and **Khairiburu and Meghashini peaks** are located in Simlipal national park. **Burhabalanga, Palpala Bandan, Salandi, Kahairi, and Deo rivers** pass through it. It is named after the '**Simul**' (**Silk Cotton**) tree.
- **Biodiversity:** Forest type is primarily dominated by **tropical moist deciduous forests**.
- **Indigenous Population:** It is inhabited by indigenous tribes like **Kolha, Santhala, Bhumija, Bhatudi, Gondas, Khadia, Mankadia, and Sahara**. The tribals worship **sacred groves** called **Jharia**.

### Key Facts About Tadoba Andhari Tiger Reserve

- **Location:** It is situated in **Maharashtra** and is the **oldest and largest national park** in the state. **Tadoba/Taru** is the **local deity** revered by the tribal people in the area. **Andhari** is derived from the **Andhari river** which flows through the reserve.
- **Geography:** It contains two primary lakes, **Tadoba Lake and Kolsa Lake**, along with the **Tadoba River**.
- **Biodiversity:** **Flora:** **Teak, semal, tendu, beheda, karaya gum, mahua madhuca, arjun, bamboo** etc. **Fauna:** **Tigers, Indian leopards, sloth bears,**

gaurs, nilgai, dhholes, small Indian civets, sambars, spotted deer, barking deer, and chital.

## 5. India's Commitment to the Sendai Framework for Disaster Risk Reduction

- India reaffirmed its commitment to the **Sendai Framework for Disaster Risk Reduction** during the recent **G-20 Disaster Risk Reduction Working Group** ministerial meeting in **Belém, Brazil**. The Indian delegation, led by Prime Minister Narendra Modi's Principal Secretary, P.K. Mishra, called for **global cooperation in technology transfer, knowledge exchange, and sustainable development** to boost disaster resilience.

### Sendai Framework:

- The **Sendai Framework for Disaster Risk Reduction (2015–2030)** is a comprehensive international agreement adopted by UN member states at the **3rd World Conference on Disaster Risk Reduction** in Sendai, Japan.
- Officially endorsed by the **UN General Assembly in June 2015**, it succeeded the **Hyogo Framework for Action (2005–2015)**, enhancing global commitments to reduce disaster risks and increase resilience across communities.
- The Sendai Framework emphasizes that **states hold the primary responsibility** for disaster risk reduction (DRR). However, it calls for **shared accountability across various stakeholders, including local governments, private sectors, civil society, and individuals**. This collaborative approach ensures a comprehensive and inclusive disaster preparedness and response system.

### Linkages with Other 2030 Global Agendas:

- The **Sendai Framework is integrally aligned with several other major 2030 Agenda agreements**, collectively aiming to create a sustainable and resilient future:
- **Paris Agreement on Climate Change**: Tackles climate change, recognizing that climate-related disasters are exacerbated by global warming.
- **Addis Ababa Action Agenda on Financing for Development**: Supports financing mechanisms for sustainable development, including disaster risk reduction.
- **New Urban Agenda**: Emphasizes building resilient cities and urban areas with sustainable infrastructure.

### India's Participation and Role at the G-20 Meeting:

- India initiated the establishment of the G-20 Disaster Risk Reduction Working Group during its G-20 presidency in 2023, underscoring India's proactive stance in global disaster risk management.

India's strategic priorities for disaster risk reduction, aligned with its G-20 presidency agenda:

1. **Strengthening early warning mechanisms** to reduce loss of life and property by providing timely alerts for impending disasters.
2. **Promoting infrastructure that can withstand natural disasters**, ensuring community safety and continuity of services.
3. **Developing financial mechanisms** to fund disaster risk reduction initiatives, emphasizing public and private partnerships.
4. **Implementing strategies for sustainable and resilient recovery post-disaster**, facilitating quicker rebuilding with improved resilience.
5. **Encouraging the use of natural ecosystems as buffers against disasters**, like afforestation to prevent soil erosion and mitigate flood risks.

## 6. Glacial Lakes rise as glaciers retreat

- Since 1977, the **South Lhonak Lake**, a glacial lake in **Sikkim** has expanded significantly, growing from **17 hectares** to **167 hectares** by **2023**.

**Formation of Glacial Lakes:**

- When a glacier melts and **retreats**, the hollow left behind often fills with water, creating a **glacial lake**.
- The rocky moraine at the glacier's end can act as a **natural dam**, holding the water to form the lake.
- **Glacial lakes** act as **hydrological buffers**, regulating water flow from melting ice, which can sometimes pose challenges to **downstream communities**.
- Glacial lakes often have a **vivid blue color**, similar to swimming pools, due to the **scattering of light** by fine rock particles (rock flour) in the water.
- **There are several types of glacial lakes, each formed by specific processes and glacier dynamics:**
- **Moraine-Dammed Lakes:** Formed when **moraine debris** piles up at the end of a glacier and traps meltwater behind it. These are common and pose risks of **outburst flooding**.
- **Kettle Lakes:** This was created when a chunk of glacier ice is buried in the moraine and eventually melts, leaving a **depression** filled with water.
- **Cirque Lakes:** Formed in circular basins (cirques) carved by glaciers at **high elevations**. These lakes are often small and located at the glacier's original head.

- **Pro-glacial Lakes:** Situated in front of the glacier, between the ice and the moraine dam. These lakes are sometimes formed when the glacier's snout melts and deposits water in the valley.

### Major Glacial Lakes in India

- India's Himalayan region is home to numerous glacial lakes, each with unique characteristics:
- **Gurudongmar Lake (Sikkim):** One of the **highest lakes in the world** at 5,430 meters above sea level, fed by glacial melt and known for its **religious significance**.
- **Chandra Taal (Himachal Pradesh):** A stunning crescent-shaped lake in the **Lahaul-Spiti region** at 4,300 meters. It is surrounded by snow-capped mountains and fed by glacier melt.
- **Samiti Lake (Sikkim):** Located along the trek to **Kanchenjunga** and known for its clear blue waters and **reflective quality**.
- **Satopanth Tal (Uttarakhand):** Found in the **Garhwal Himalayas**, this lake lies close to **Satopanth Glacier** and is considered sacred by locals.
- **South Lhonak Lake (Sikkim):** A growing lake fed by three glaciers, expanding rapidly due to **climate change** and posing risks of **glacial lake outburst floods**.

### 7. Current Scope of Tuberculosis in India

- The Global Tuberculosis Report 2024 indicates that India recorded the highest burden of tuberculosis (TB) in 2023.
- **High Burden:** According to the *Global Tuberculosis Report 2024*, India accounts for 26% of all tuberculosis (TB) cases worldwide, making it the country with the highest TB burden. The report indicates that over 55.9% of global TB cases are concentrated in five countries: India, Indonesia, China, the Philippines, and Pakistan.
- **Mortality Rates:** Although TB deaths in India have decreased from 580,000 in 2010 to 320,000 in 2023, the country still accounted for 26% of global TB deaths among people with and without HIV in 2023.
- **Incidence Trends:** The incidence of TB has decreased from 275.7 cases per 100,000 population in 2010 to 194.9 cases in 2023. However, there has been a notable increase in notified TB relapse cases, reaching the highest level since 2010.

### Strategies and Programs Implemented by Govt to Reduce TB Incidence

- **National Tuberculosis Elimination Program (NTEP):** This program aims to eliminate TB by 2025 through various strategies including early diagnosis, treatment support, and preventive measures.
- **TB Preventive Therapy (TPT):** The introduction of TPT marks a significant shift in TB care in India. It focuses on providing preventive treatment to individuals at high risk of developing active TB.
- **Project Axshya Plus:** Launched with support from the Global Fund, this project implements comprehensive interventions such as contact tracing, testing for infection, and managing latent TB infections.
- **Increased Funding:** Domestic funding for TB prevention and treatment increased by 38% in 2023 to \$253 million, although international funding has declined during the same period.
- **Community Engagement Initiatives:** Programs like the Pradhan Mantri TB Mukh Bharat Abhiyan encourage community involvement in supporting TB patients through initiatives like Ni-kshay Mitras.

### Challenges India Faces in Eliminating Tuberculosis by 2025

- **Funding and Infrastructure Gaps:** Despite increases in domestic funding, overall financial resources remain lower than pre-COVID levels, impacting program implementation and outreach efforts.
- **Inadequate healthcare infrastructure,** particularly in rural areas, hampers access to timely diagnosis and treatment for many patients. The COVID-19 pandemic disrupted TB services significantly, leading to a backlog of undiagnosed cases and impacting ongoing treatment programs.
- **Stigma and Discrimination:** Stigma associated with TB continues to deter individuals from seeking diagnosis and treatment, which can lead to delayed care and increased transmission rates. Social determinants such as poverty, malnutrition, and living conditions contribute to higher susceptibility to TB among vulnerable populations.
- **Drug Resistance Issues:** The rise of drug-resistant strains of TB poses significant challenges for effective treatment and control strategies.
- **Multi-sectoral Coordination Challenges:** Effective elimination requires collaboration across various sectors (healthcare, education, social services), which can be challenging due to bureaucratic hurdles.

### Way forward:

- **Strengthening Multi-Sectoral Coordination:** There is a need to foster collaboration among healthcare, education, and social services to address the social determinants of TB.
- **Enhancing Accessibility and Outreach:** Need to improve access to TB diagnosis and treatment in rural areas by investing in healthcare

infrastructure, training local health workers, and implementing mobile health units.

## 8. Reasons for the disparity in rural wages

- Despite the high growth rate of Indian economy , the rural wages growth has been very minimal.

### Disparity in rural wages

- **Economic Growth** - The Indian economy has grown at an average annual rate of *7.8% in the last three fiscal years* (April-March) alone.
- **Farm Sector Growth** - Average growth rate of farm sector in this period 4.2%.
- **Nominal Rural Wage Growth** - The average nominal year-on-year growth in rural wages between 2018-19 to 2023-24 is *5.2%*. The Growth in Agricultural wages - 5.8%
- **Less Real Growth** - Inflation-adjusted average real annual growth was *-0.4%* for rural and *0.2%* for agricultural wages during this period.
- **Disparity** - Real rural wages remains stagnant, if not negative, when the country's GDP and the farm sector growth have been decent-to-good.
- **Impact of the Disparity** - When jobs and incomes do not exhibit growth commensurate with wider GDP measures, it affects the consumption, sales leading to stagnant economy.

### What are the reasons for the disparity in rural wages?

- **Rising Female LFPR** - Labour Force Participation Rates (LFPR) among women is increasing. The all-India average female LFPR was only 24.5% in 2018-19. It rose to *41.7% in* the latest official *Periodic Labour Force Survey for 2023-24 (July-June)*.
- LFPR is the percentage of the population aged 15 years and above that is working or seeking/willing to work for a relatively long part of a particular year.
- **Increasing RLFPR** - Rural female LFPR has been increased from 26.4% in 2018-19 to 47.6% in the following five years.
- **Less Male LFPR Growth** - During 2018-19 to 2023-24, the male LFPR has gone up only marginally, from 75.5% to 78.8% for all-India and from 76.4% to 80.2% for rural India.
- **Better Living Standards** - Flagship programmes like Ujjwala, Har Ghar Jal, Saubhagya, and Swachh Bharat have eased the access to clean cooking fuel, electricity, piped drinking water, and toilets.

- **Declining Women's Burden** - These schemes have also freed up rural women's time and effort that went into fetching water or collecting firewood and dung.

### What can be done to improve rural wages?

- **Boost Labour Demand** - Rural wages can only increase if the demand for rural labor grows faster than its supply.
- **Promote Rural Non Farm Employment** - It is necessary to absorb the increasing rural labour supply especially the female labours.
- **Rural Infrastructure Development** - Rural electrification, roads and banks can increase real agricultural wages by facilitating the nonfarm livelihood and employment.
- **Enhance Skill Development** - Invest in skill development programs to improve the employability and productivity of rural workers.
- **Income Transfer Schemes** - State government schemes like Maharashtra's Ladki Bahin Yojana supplements the rural wages with government basic incomes to women.

### 9. Significance of the IPEF

- Recently India signed the US-led 14-member Indo-Pacific Economic Framework for Prosperity (IPEF) bloc's agreements on a clean and fair economy.

#### IPEF

- **IPEF** - Indo-Pacific Economic Framework for Prosperity was launched jointly by the USA and other partner countries of the Indo-Pacific region on May 23, 2022 at Tokyo.
- **Goal** - It seeks to strengthen economic engagement and cooperation among partner countries for advancing growth, economic stability and prosperity in the region.
- **14 Member Countries** - USA, Australia, Brunei, Fiji, India, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, Vietnam.
- **Significance of the IPEF** - Inclusive growth, Environmental sustainability, Fair economic competitiveness.
- **Reshape Economic Relations** - The pillars of supply chains, a clean economy, and a fair economy will reshape economic relations in the region.

#### Pillar II - Supply Chain

- **Aim of Supply Chain Pillar**
  - Deepening cooperation to build more competitive and resilient supply chains.
  - Better prepare for, prevent, and respond to supply chain disruptions when they happen.
  - Ensure that regional supply chains raise up workers and respect labour rights.
- **Benefits** - This pillar helps in supply chain diversification among the member countries.
- **Boost Domestic Manufacturing** - It supports India's self-reliance initiatives (Aatmanirbhar Bharat) and Production Linked Incentive (PLI) schemes by mobilizing investments in production, logistics services, and infrastructure.
- **Shift of Production Centers** - The agreement is expected to attract production centers in key goods and critical sectors to India, boosting domestic manufacturing.
- **Global Supply Chain Integration** - The agreement facilitates deeper integration of Indian MSMEs (Micro, Small, and Medium Enterprises) into global supply and value chains.
- **Economic Resilience** - It helps mitigate risks of economic disruptions from supply chain shocks and adverse events, creating a more resilient economic environment.
- **India's Tech Advancement** - Initiative on Critical and Emerging Technologies (iCET)-related sectors such as cyber security and artificial intelligence, will ensure that India remains at the forefront of technological advances.
- **Workforce Development** - It includes provisions for upskilling and reskilling the workforce, ensuring that Indian workers are well-prepared for the demands of modern supply chains.

### Pillar III - Clean Economy

- **Aim** - To advance cooperation on research, development, commercialization, availability, accessibility, and deployment of clean energy and climate friendly technologies.
- **Objectives of Agreement on Clean Economy** - Accelerate efforts of IPEF partners towards energy security and transition, climate resilience and adaptation, GHG emissions mitigation.
- **Benefits** - U.S.-India clean energy partnership is vital in helping India achieving net zero carbon emissions by the year 2070.
- **Technical Cooperation** - Collaborate to facilitate development, access, and deployment of clean energy and climate-friendly technologies



## Pillar IV – Fair Economy

- **Aim** - To create a more transparent and predictable trade and investment environment across the Indo-Pacific.
- **Benefits** - Expand trade, investment ties and ensure the benefits of trade are broadly shared throughout their economies.
- **Mitigate Trade Hurdles** – Reducing trade complexities & barriers, opaque regulatory requirements and tax policies that encourage corrupt behaviour in certain emerging markets.
- **International Financial Cooperation** - It enhances information sharing among partners, facilitating asset recovery and strengthening cross-border investigations and prosecutions.

### What lies ahead?

- IPEF represents more than a series of trade and investment agreements and is a strategic effort to cement partnerships in the region.
- Revival of Generalized System of Preferences (GSP) of US will boost trade with US.
- Building consensus along the lines of QUAD to address geopolitical turbulence, and global economic uncertainty.
- Enhancing information sharing among partners, facilitating asset recovery and strengthening cross-border investigations and prosecutions.

## 10. Impact of India's Dedicated Freight Corridors

- Dedicated Freight Corridors are boosting India's GDP and significantly enhancing Indian Railways' revenue, according to a recent study by Australia's University of New South Wales.

### Dedicated freight corridors (DFCs)

- Dedicated Freight Corridors (DFCs) are specialized railway tracks for freight transportation, designed to improve efficiency with faster, high-capacity trains like double-stack containers and heavy-haul freight trains.
- **India has two main DFCs: Eastern DFC (EDFC):** Spanning 1,337 km from Sonnagar (Bihar) to Sahnewal (Punjab). The EDFC is operational and includes feeder routes connecting coal mines and thermal plants. **Western DFC (WDFC):** Extends 1,506 km from Jawaharlal Nehru Port (Mumbai) to Dadri (Uttar Pradesh). The WDFC is 93% complete, serving major ports in Gujarat. Full completion is expected by December 2025. As of March 31, 2024, the project has incurred costs of ₹94,091 crore, excluding land acquisition.

### Australian varsity study say

- Conducted by the **University of New South Wales**, this study used a Computable General Equilibrium model to assess the WDFC's impact, specifically from *FY 2019–20*.
- The **study's findings** include: Reduced freight costs and travel times have decreased commodity prices by *up to 0.5%*. The DFCs contributed to a **2.94% increase in Indian Railways' revenue** between FY 2022–23 and FY 2018–19. Western regions gained significantly from reduced freight costs, which had a "*social-equalizing effect*," benefiting states with lower per capita GDP.
- Published in **Elsevier**, the study integrated freight costs, industry inputs, population data, and rail and road data.

### Economic benefits do Dedicated Freight Corridors (DFCs) bring to India

- **Improved Supply Chains:** DFCs provide faster, efficient transit for freight, enhancing the supply chain for industries and logistics providers. **Cost Savings:** Reduction in freight transport costs lowers overall logistics expenses, which can lead to price reductions for consumers.
- **Revenue Growth for Railways:** DFCs have directly contributed to revenue increases, supporting the Railways' finances.
- **Increased Freight Share:** The corridors are key to meeting the National Rail Plan's target of achieving a 45% rail share in freight by 2030.
- **Exports and Imports:** Faster, dedicated freight routes boost export-import activities, as DFCs support port connectivity, particularly in the West.
- **Decongested Rail Network:** By shifting freight traffic off the main passenger routes (e.g., the Golden Quadrilateral), DFCs alleviate congestion, improving both freight and passenger rail reliability.

### Current Operational Status and Future Outlook

- As of now, **325 trains run daily on the DFCs**, which is a 60% increase from the previous year.
- DFC trains are faster, safer, and capable of carrying heavier loads, contributing to over **10% of Indian Railways' total freight operations**. DFCCIL is conducting further research on DFCs' economic impact, with results expected soon, which will provide deeper insights into their long-term contributions to India's economic growth.

### Challenges related to the development of DFC:

- **Land Acquisition Delays:** Acquiring *over 8,800 hectares*, often privately owned and developed land, has caused setbacks, with disputes and legal cases prolonging the process.

- **Escalating Costs:** Project costs have surged significantly, with Japan International Cooperation Agency (JBIC) noting that expenses have nearly doubled, raising concerns about financial viability and potential investor reluctance.
- **Technology Disputes:** Differences over locomotive technology – diesel versus electric – pose delays, as stakeholders like Indian Railways and JBIC debate environmentally friendly solutions.
- **Utility and Infrastructure Challenges:** Shifting utilities (power lines, water pipes) and constructing road overbridges and under-bridges add logistical complexities.
- **Funding and Financial Management:** Reliance on external funding and the need for efficient resource management impact project timelines and execution stability.

#### Way Forward:

- **Streamlined Land Acquisition and Cost Management:** Need to implement a centralized framework for faster land acquisition and cost oversight to mitigate delays and prevent cost escalations, ensuring project feasibility and investor confidence.
- **Technological and Funding Consensus:** Need to establish clear technology standards (e.g., electric locomotives) for environmental benefits and secure diversified funding sources to reduce dependence on external financing, enabling timely completion and sustainable operations.

#### 11. How Vitamin D deficiency can trigger autoimmune conditions?

- Recent research conducted by scientists at McGill University has shed light on the critical role of vitamin D in maintaining thymus health and its implications for immune function.

#### Autoimmune Conditions:

- **Autoimmune conditions** refer to disorders where the immune system mistakenly attacks the body's own healthy tissues, viewing them as foreign.
- Vitamin D plays a role in **regulating immune responses** and promoting **immune tolerance** – the body's ability to avoid attacking its own cells.
- It influences **T-cells** (a type of immune cell) to recognize and tolerate the body's own tissues rather than attacking them.
- The **thymus gland** trains T-cells to avoid attacking healthy cells. A deficiency in Vitamin D may cause the thymus to age prematurely, reducing its ability to regulate T-cells properly. Vitamin D affects certain **genetic pathways** related to immune function.

- Variations in the **vitamin D receptor (VDR) gene** may also predispose some individuals to autoimmune diseases, and these individuals might be more sensitive to Vitamin D levels.

## Vitamin D

- Vitamin D is a **fat-soluble vitamin** crucial for the body's ability to absorb **calcium, magnesium, and phosphate**, which are essential for **bone health**.
- It supports **muscle movement, nerve function, and immune system** responses. Due to its synthesis in the skin upon exposure to sunlight, it is often called the '**sunshine vitamin**'.
- The body naturally produces Vitamin D when skin is exposed to **ultraviolet B (UVB) rays** from sunlight.
- **Sources of Vitamin D:**
  - **Fish:** Salmon, mackerel, tuna, and sardines are rich in Vitamin D.
  - **Cod liver oil:** A concentrated source, providing 400–1,000 IU per teaspoon.
  - **Mushrooms:** Varieties like portobello contain Vitamin D if exposed to UV light.
  - **Fortified Foods:** Milk, yogurt, orange juice, and cereals often have added Vitamin D.
  - **Egg yolks:** Contain a small amount of Vitamin D.
  - Common forms include **Vitamin D2 (ergocalciferol)** and **Vitamin D3 (cholecalciferol)**, especially useful in autumn and winter when sunlight exposure is limited.

## Significance of Vitamin D

- **Bone Health:** Essential for **calcium absorption**, which strengthens bones and prevents **osteoporosis**.
- **Muscle and Nerve Function:** Supports **muscle contractions** and **nerve signaling** between the brain and body.
- **Immune System:** Enhances immune defenses, helping to fight off infections by **viruses and bacteria**.
- **Brain Health:** May play a role in maintaining **cognitive health**, especially with aging.
- **Inflammation and Pain:** Helps regulate the body's response to **inflammation and pain**.
- **Blood Pressure:** Linked to regulating blood pressure; deficiency is associated with **hypertension**.

## Impacts of Vitamin D Deficiency

- Increases the risk of **rickets** in children (softening of bones) and **osteoporosis** in adults.
- Low levels of Vitamin D are linked to autoimmune conditions like **rheumatoid arthritis, lupus, and multiple sclerosis**.
- Recent studies indicate that Vitamin D deficiency can **accelerate thymus aging**, leading to immune dysfunction and a higher risk of autoimmune diseases.
- Deficiency has been associated with **cancer, cardiovascular disease, diabetes, depression, and chronic pain**.
- Can include **fatigue, muscle weakness, bone pain, and depression**.
- In severe cases, deficiency may cause **impaired bone growth and fracture susceptibility**.

## 12. RNA Editing

- Recently, companies like Wave Life Sciences have made significant strides in RNA editing, with the first clinical application of this technology.
- **Definition:** RNA editing involves making precise changes to RNA molecules, which carry instructions from DNA to produce proteins. This process allows scientists to correct errors in RNA before they are translated into proteins.
- **Mechanism:** One method uses enzymes like adenosine deaminase acting on RNA (ADAR) to convert adenosine to inosine, which mimics guanosine, restoring normal protein function.
- **Guide RNA (gRNA):** gRNA directs ADAR enzymes to specific mRNA regions to correct mutations linked to genetic disorders.

### Difference Between RNA and DNA Editing:

- **Permanency:** DNA editing makes permanent changes to the genome; RNA editing makes temporary changes, reducing long-term risk.
- **Safety:** DNA editing uses proteins from bacteria, which may cause immune reactions; RNA editing utilizes ADAR enzymes already present in the human body, lowering immune risks.
- **Flexibility:** RNA editing allows effects to fade over time, enabling doctors to stop treatment if side effects arise.

### Challenges in RNA Editing:

- **Specificity:** ADAR enzymes may cause unintended edits in non-targeted mRNA regions, which could lead to side effects.

- **Transient Effects:** The temporary nature of RNA edits requires repeated treatments for sustained benefits.
- **Delivery Limitations:** Current delivery methods, like lipid nanoparticles, struggle with transporting large molecules, limiting effectiveness.

### Applications in Various Fields:

- **Genetic Disorders:** Treats single-point mutations in conditions like Huntington's disease, Duchenne muscular dystrophy, and alpha-1 antitrypsin deficiency.
- **Neurological Conditions:** Companies are exploring RNA editing for diseases like Parkinson's.
- **Oncology:** Rzymomics' trials focus on using RNA editing to regulate protein production related to liver cancer.
- **Ophthalmology:** Treating ABCA4 retinopathy, which is caused by mutations affecting protein expression in the eye.

### Conclusion:

- RNA editing offers a promising, flexible approach to treating genetic disorders with fewer risks than DNA editing. As clinical applications expand, RNA editing is poised to become a vital tool in precision medicine. Ongoing research and collaboration are key to unlocking its full potential.

### 13. Major causes of Groundwater depletion

- A recent study titled **Detection and Socio-Economic Attribution of Groundwater Depletion in India**, highlighted the significant impact of urbanisation and industrialisation on groundwater depletion in five Indian states.

### Key Findings of the Study

- **Affected States:** The study raises serious concerns for five hotspots namely Punjab and Haryana, Uttar Pradesh, West Bengal, Chhattisgarh and Kerala:
  - **Punjab and Haryana (Hotspot I):** Most affected, with 64.6 billion cubic metres of groundwater lost in two decades.
  - **Uttar Pradesh (Hotspot II):** Irrigation demand fell by 8%, while domestic and industrial use rose by 38%, causing a 4% groundwater decline.
  - **West Bengal (Hotspot III):** Minimal irrigation growth (0.09%), but a 24% rise in other uses, led to a 3% groundwater drop.
  - **Chhattisgarh (Hotspot IV):** Increased use in all sectors led to declining groundwater levels.
  - **Kerala (Hotspot V):** Groundwater declined by 17% despite high rainfall, due to a 36% irrigation drop and 34% increase in other uses.

- **Primary Cause: Rapid Urbanisation:** It increased by 10 per cent between 2001 and 2011 and industrialisation, especially in urban areas like Faridabad and Gurgaon which are not heavily reliant on agriculture, but saw sharp declines in groundwater levels since 2012. **Rising Demand:** Increased domestic and industrial water consumption, coupled with only a slight decrease in rainfall during the study period.

### How is Urbanisation Accelerating Groundwater Depletion?

- **Reduced Natural Recharge:** Impervious surfaces limit rainwater infiltration, hindering natural groundwater recharge.
- **Over-Extraction:** Limited alternative sources in cities lead to excessive, unregulated groundwater extraction. Urban expansion drives high water demand, and it is heavily reliant on groundwater, especially where surface water is scarce.
- **Pollution:** Urban waste and untreated sewage contaminate groundwater, reducing clean water availability and increasing extraction from deeper sources.
- **Higher Extraction Costs:** Deeper water tables from overuse raise pumping costs, with subsidies sometimes exacerbating unregulated extraction.

### Major Causes of Groundwater Depletion

- **Over-Reliance on Groundwater:** Irrigation accounts for approximately 80% of India's total water usage, with a significant portion of this water drawn from groundwater. As the demand for food rises, the extraction of groundwater for irrigation is increasing, leading to its depletion.
- **Poor Water Management:** Inefficient water use, leaking pipes, and inadequate infrastructure for capturing and storing rainwater all contribute to the depletion of groundwater.
- **Decline in Traditional Water Conservation Methods:** Practices like rainwater harvesting, step wells, and check dams have decreased, leading to missed opportunities for groundwater recharge.
- **Climate Change:** Rising temperatures and shifts in precipitation patterns can impact the recharge rates of groundwater aquifers, making them more susceptible to depletion. Factors like deforestation, which leads to soil erosion, can reduce the amount of water able to seep into the ground, diminishing the natural recharge of groundwater aquifers. Climate change events such as droughts, flash floods, and disrupted monsoon seasons are intensifying pressure on India's groundwater resources.

## Challenges in Groundwater Management in India

- **Overexploitation:** The **Green Revolution** increased the need for groundwater to support food security, leading to widespread borewell installations. The Central Groundwater Board reports **17%** of blocks are overexploited, with significant depletion in north-western, western, and southern India.
- **Climate Induced Challenges:** Erratic rainfall and increased pollution have exacerbated water scarcity. Groundwater serves **85%** of rural domestic water, **45%** of urban water, and over **60%** of agricultural irrigation, impacting multiple sectors.
- **Weak Regulatory Framework:** Regulations currently cover only **14%** of overexploited blocks, allowing unchecked groundwater extraction. Lack of local regulatory enforcement in early stages of depletion exacerbates water scarcity.
- **Community Involvement and Institutional Weaknesses:** **Participatory Groundwater Management (PGM)** has empowered communities in some regions, but success is limited by weak institutions and supply failures. Informal groundwater committees often become inactive after project completion, lacking sustainability in the long term.

## Strategies for Sustainable Groundwater Management

- **Address Demand and Supply:** Supply Side: Initiatives like watershed management and aquifer recharge are vital but need complementary demand-side measures. Demand Side: Promoting water-efficient irrigation (e.g., drip systems) and encouraging less water-intensive crops can reduce stress on groundwater resources.
- **Community Participation:** Enhanced community involvement in governance improves sustainability, as shown by the PGM approach in regions with defined aquifers. Empowering local institutions and supporting capacity development at the community level is essential for effective management.
- **Regulatory Enhancements:** Comprehensive regulatory measures at local levels before blocks reach the overexploited stage can prevent further depletion. Long-term viability of institutions like **Water User Associations (WUAs)** is crucial for sustained groundwater management.

### 14. India Joins ARIN-AP Steering Committee

- Recently, India, represented by the **Directorate of Enforcement (ED)**, has been included in the **Steering Committee of the Asset Recovery Interagency Network-Asia Pacific (ARIN-AP)**. India will assume the **presidency of ARIN-AP in 2026** and host the network's **Annual General Meeting (AGM)**.



- This aligns with India's priorities under the **G-20 framework**, particularly with respect to the **Nine Point Agenda** on tackling **fugitive economic offenders** and **asset recovery**.

### Key Facts About ARIN-AP

- **About:** ARIN-AP is a **multi-agency network** to **exchange information** on individuals, companies, and assets in the **Asia-Pacific region** with the intention of facilitating the **pursuit and recovery** of proceeds of unlawful activities. It is a member of the **Global Camden Asset Recovery Inter-agency Network (CARIN)**.
- **Objectives:** Focus on the **proceeds of all crimes**, within the framework of international obligations. Form a solid **international network** with other related organisations such as **United Nations Office on Drugs and Crime (UNODC)** and **CARIN**. Facilitate and **promote training** in all aspects of tackling the proceeds of crime. To **increase the effectiveness** of members' efforts in **depriving criminals** of their illicit profits by tackling the proceeds of crime
- **Membership:** It includes **28 member jurisdictions** and **nine observers** to facilitate **cross-border collaboration** on asset tracing, freezing, and confiscation.
- **Secretariat:** The Secretariat's role is handled by the **Korean Supreme Prosecutors' Office (SPO)**.

### Key Points Related to CARIN

- **About:** CARIN is an informal network or an inter-agency network represented by law enforcement and judicial experts (e.g., prosecutors or judges) from each member state.
- **Purpose:** It supports the full **asset recovery process** – from **asset tracing to freezing, seizure, management, forfeiture/confiscation, and cross-jurisdictional asset sharing**.
- **Secretariat:** The CARIN permanent Secretariat is based at **Europol Headquarters in the Hague**.
- **Membership:** CARIN currently has **61 registered member jurisdictions**, including **27 EU Member States** and **13 international organisations**. It is also linked to the other seven regional asset recovery inter-agency networks (ARINs) across the globe.
- **Finance:** It is funded by the **European Union**.
- **Structure and Communication:** Member representatives are designated as "**national contact points**" and are **English-speaking**, as English is the network's working language.

- **Functioning:** The organisation is governed by a Steering Group of **nine members** and a **rotating annual Presidency**.

### 15. Measures taken to combat air pollution Delhi's Persistent Air Quality

- Delhi's average air quality in October was in the very poor category at 356 – the worst in the country, as per the Central Pollution Control Board.

#### What are the major contributors to Delhi air pollution?

- The most polluted months in the year are generally November, December and January, according to the data on monthly AQI averages.
- **Construction Dust** - Dust from construction sites contributes 20-30% of all air pollution emitting large amounts of PM<sub>10</sub> and PM<sub>2.5</sub> into the atmosphere.
- **Cold Air Traps** - During winter cold air retains this particulate matter for longer period and thus most polluted months in the year are generally November, December and January.
- **Stubble Burning** - Coinciding of Diwali festivities and stubble-burning season in Punjab , Haryana, Uttar Pradesh.
- World Health Organisation suggest that daily average PM 2.5 levels should not exceed 15 µg/m<sup>3</sup> and for PM 10 levels, the limit is set at 45 µg/m<sup>3</sup>. Recent data from the Delhi Pollution Control Committee (DPCC), the PM 2.5 and PM 10 levels reached up to 445 µg/m<sup>3</sup> and 1,566 µg/m<sup>3</sup>.

#### Measures taken to combat air pollution

- **Graded Response Action Plan (GRAP)** - Commission for Air Quality and Management (CAQM) activates various measures under GRAP plan depending on Air Quality Index levels.
- It has four stages, each with different restrictions based on the air quality.
- **Vehicle Restrictions** - Diesel vehicles over ten years old and petrol vehicles over 15 years are restricted from entering Delhi.
- **Disincentivizing Private Transport** - New Delhi Municipal Council (NDMC) hiked parking fees for private 2-wheeler and 4-wheeler vehicles.
- **Cleaner Transportation** - Intercity buses plying to Delhi daily from various cities in Haryana, UP and Rajasthan have been shifted completely to much cleaner BS-VI diesel/CNG/EV mode.
- **Environment Compensation Charges** - RFID (radio-frequency identity) system was implemented by South Delhi Municipal Corporation (SDMC) for collection of tolls and from commercial vehicles entering Delhi.

- **Construction Regulations** - Stringent dust control measures at construction sites, including anti-smog guns and remote monitoring, aim to reduce particulate matter generated by these activities.
- **Stubble Burning Control** - Crop diversification, promoting basmati variety, low straw and early maturing paddy varieties, and direct seeding of rice methods have been planned to reduce paddy straw generation.
- **National Clean Air Programme (NCAP)** - It set targets of **40% reduction** in particulate matter concentration, by **2026** in 131 of India's most polluted cities.

### Reasons for the ineffectiveness of these measures?

- **Lack of Coordination** - Delhi, Haryana and Punjab are at loggerheads on the issue of stubble burning.
- **Failure to Check Crop Burning** - CAQM has failed its mandate of driving change in the post-harvest practices of farmers in Delhi's neighbourhood.
- **Inadequacy of emergency measures** - They are not to address most other factors that drive NCR's pollution, including vehicular and industrial pollution.
- **Lack of Public Awareness** - Domestic burning of bio masses and not using of private transport are still prevalent among the public.
- **Deficiency in Urban Management** - Greening the city and cleaning the road dust are still lacking.

### To improve air quality

- Implementing advanced forecasting models to anticipate pollution spikes for proactive interventions.
- Reducing waste burning in pockets by better collection and segregation of waste, replacing biomass for cooking in urban slums by providing easier access to LPG.
- Strengthen public transport infrastructure, enhancing dust and vehicle emission controls.

## 16. CSR's Role in Agriculture

- Ten years ago, India became the first country to legally mandate **Corporate Social Responsibility (CSR)**. The **section 135** of the **Companies Act 2013** establishes the rules governing CSR.
- According to the National CSR Portal, ₹1.84 lakh crore in CSR funds was disbursed between 2014 and 2023. **Corporate Social Responsibility (CSR)** is a business practice where companies contribute to social, economic, and

environmental betterment, addressing societal needs alongside their profit-making objectives

- In India, the minimum percentage of a **company's net profit** that must be spent on corporate **social responsibility (CSR)** is **2%**.

### Sectoral division of CSR:

- **Education:** Receives the highest CSR share (33%-40%) for building schools, scholarships, infrastructure, and vocational training.
- **Health Care:** Allocates 20%-30% of CSR funds to hospitals, health camps, sanitation, and disease prevention.
- **Environmental Sustainability:** Accounts for 5%-10% of CSR funds, with projects in biodiversity conservation, waste management, and renewable energy.

### CSR's Role in Agriculture

- Claims 10%-15% of CSR funds, targeting infrastructure, agricultural practices, and livelihood support.
- Since the enactment of the Companies Act in 2013, which mandates CSR spending, a total of Rs **1.84 lakh crore** has been disbursed in CSR funds **from 2014 to 2023**. These funds have increasingly **targeted sustainability initiatives** within agriculture, with 23% of surveyed companies prioritizing "environment and sustainability" in their CSR activities. Over 90.8% of farmers involved in CSR programs reported improvements in income or risk reduction due to these initiatives.
- Agriculture contributes approximately 15% to 18.2% of India's GDP, reflecting a decline from 35% in 1990-91 due to rapid growth in the **industrial and service sectors**. The average annual growth rate of the agricultural sector has been around 4% over the **last five years**. (acc to pib data)

### Key requirements to improve agricultural sustainability

- **Investment in Infrastructure:** There is a pressing need for capital investment in infrastructure development, including irrigation systems, cold storage, and transportation networks to reduce post-harvest losses and improve market access.
- **Technological Advancements:** Adoption of modern agricultural practices and technologies is essential. This includes better seed varieties, efficient irrigation methods, and sustainable farming techniques to enhance productivity.

- **Environmental Sustainability Initiatives:** Projects focusing on water conservation, energy-efficient irrigation, and agroforestry are critical for maintaining ecological balance while improving agricultural output.

### What hinders CSR's potential for agriculture?

- **Lack of Clear Reporting Mechanisms:** One of the main obstacles is the absence of robust frameworks to track and categorize CSR funding specifically directed towards agricultural initiatives. Current reporting practices do not emphasize agriculture-related CSR activities adequately.
- **Diverse Allocation Categories:** CSR activities can fall under multiple categories (e.g., gender equality, and environmental sustainability), making it difficult to isolate funds specifically aimed at agricultural sustainability. This lack of specificity hampers effective monitoring and impact assessment.
- **Need for Distinct Sector Identification:** To maximize CSR contributions to agriculture, it is crucial to identify agriculture as a distinct sector within CSR activities. This would streamline funding processes and enhance transparency and accountability in how funds are utilized for agricultural development.

### Way forward:

- **Establish Agriculture as a Separate CSR Category:** Need to create a distinct sector for agriculture in CSR reporting to streamline funding, improve transparency, and enable targeted monitoring of agriculture-focused initiatives.
- **Implement Comprehensive Reporting Frameworks:** The government should develop robust mechanisms for tracking CSR funds specifically allocated to agricultural projects, ensuring clear categorization and facilitating better impact assessments.

### 17. In Depth Analysis: 6G

- India aims to become a global leader in 6G technology by 2030 through the Bharat 6G Mission. The initiative builds on the success of 5G deployment, covering 98% of districts in just 21 months.

### Features of 6G Technology:

- **Terahertz (THz) Frequencies:** 6G will use waves in the THz range, capable of carrying significantly more data than 5G. **Massive MIMO:** Supports numerous devices and connections using multiple antennas for better data transmission and reception.

- **Network Slicing:** Enables creating smaller, specialized networks for distinct traffic types, like video streaming or automation.
- **Enhanced Security:** Employs advanced encryption and authentication methods to safeguard sensitive data and applications. **Ultra-Reliable Low Latency Communication (URLLC):** Ensures extremely low latency, supporting mission-critical applications like industrial automation and VR/AR.
- **Integrated Intelligent Reflecting Surfaces (IIRS):** Enhances signal strength and quality in areas with poor reception.

### Steps taken by the government on 6G:

1. **Bharat 6G Vision and Strategy: Vision Statement:** Design, develop, and deploy 6G technologies for secure, intelligent, and pervasive connectivity globally. **Core Principles:** Affordability, sustainability, and ubiquity, aligned with the national vision of Atmanirbhar Bharat (self-reliant India).
2. **Goals:** Facilitate R&D in 6G technologies through startups, companies, and universities. Develop affordable 6G telecom solutions. Enable global IP and patent contributions from India. Enhance quality of life through transformative applications.
3. **Technology Innovation Group (TIG) on 6G:** Established on November 1, 2021, to develop a roadmap for 6G in India. Constituted six task forces focusing on: Multidisciplinary solutions. Spectrum management. Devices and networks. International standards. Funding for R&D.
4. **Bharat 6G Alliance:** A collaboration of domestic industry, academia, and research institutions. Focuses on 5G advancements, 6G product development, and patent generation. Aligns with global alliances like the Next G Alliance (US), 6G Flagship (Finland), and South Korea's 6G Forum.

### Challenges associated with 6G technology:

- **Technical complexity:** Advanced components and subsystems increase the complexity of development and deployment. **Infrastructure deployment:** Requires massive investment and regulatory support for infrastructure upgrades. **Spectrum allocation:** Limited spectrum availability poses challenges for allocation amid competing demands. **Security concerns:** High-speed data transmission increases vulnerability to cyber-attacks, necessitating robust security measures.

### Conclusion:

- India's 6G mission embodies a forward-looking approach to digital innovation, ensuring the nation remains a global technology leader. Through

strategic investments, international collaborations, and inclusive policies, India can harness 6G to drive socio-economic growth and global connectivity.

## 18. Impact of Exits of Foreign Institutional Investors' (FIIs) from Indian Markets and response of Domestic Investors

- **Record FII Outflow in October 2024:** October 2024 saw the highest-ever FII outflow, with 94,017 crore withdrawn from Indian stock markets. This peak outflow surpassed previous significant FII exits, including: **March 2020** – the beginning of the COVID-19 pandemic, **June 2022** and **March 2022**, which also recorded substantial FII exits but were notably lower than October 2024.
- **Short-Term Volatility in Indian Stock Markets:** The massive FII exit has contributed to **increased short-term volatility**. Experts caution that **volatility may persist** in the near term if FII outflows continue.
- **Domestic Institutional Investors (DIIs) as Market Stabilizers:** DIIs, including mutual funds, insurance companies, and pension funds, have continued to **buy Indian equities**, offsetting FII sales. In October, DIIs invested around ₹1 lakh crore in Indian stocks, helping to stabilize the market amidst FII outflows. This consistent DII buying is driven by confidence in **India's medium-term growth potential**.
- **Global Factors Influencing FII Exits:** The FII sell-off is largely driven by **global economic factors**, including: **Rising U.S. bond yields**, which present attractive investment alternatives for FIIs. **China's recent economic stimulus** measures, such as reduced reserve requirements, lower mortgage rates, and easier borrowing access for institutional investors, making Chinese markets more appealing.

### New Collective Quantified Goal (NCQG) on Climate Finance:

- **Need for a New Target:** At COP26 (2021), it was agreed that more funding is required to meet **Paris Agreement** goals: Reduce global emissions by **45%** by **2030**. Keep global temperature rise **below 2°C** compared to pre-industrial levels. Since 2022, discussions have been ongoing to establish a new target, known as the **NCQG**, to be set by **2025**.
- **Current Debates on NCQG:** Proposed targets range from **\$1 trillion to \$1.5 trillion** with a commitment period until **2035**. The only consensus so far is that the **NCQG** must build upon the existing **\$100 billion as a minimum baseline**.

### Concerns Raised by India:

- **India's Perspective on Financing:** Open to diverse forms of climate finance, including: Grants. Concessional loans from multilateral banks. Investments in

technology. Opposition to classifying business-as-usual investments as climate finance. Resistance against attempts to include developing countries like **India** and **China** under new categories such as “**major economies**” for **NCQG contributions**.

- **Key Official’s View:** Progress is unlikely if climate finance focuses on **short-term profit motives** or includes countries outside the **Paris Agreement’s** scope.

## 19. Sagar Parikrama

- Recently, an autonomous surface vessel built by Sagar Defence Engineering has completed a 1,500-km voyage from Mumbai to Thoothukudi under without human intervention.

### Sagarmala Parikrama:

- Sagarmala Parikrama journey was virtually flagged off by the Union **Defence Minister** on October 29 during the Swavlamban event.★
- It is supported by the Indian Navy’s Naval Innovation and Indigenisation Organisation (NIIO), **Technology Development Acceleration Cell (TDAC)**, and the **Innovations for Defence Excellence (iDEX)**.
- The Sagarmala Parikrama aligns with global **advancements in autonomous surface** and underwater systems, offering transformative applications in both military and civilian sectors.
- This first-of-its-kind journey highlights India’s growing expertise in autonomous maritime technology and establishes a significant milestone in developing cutting-edge, unmanned systems for national security.
- **Applications:** It paves the way for future deployment of autonomous vessels in critical **sea lanes, coastal surveillance, and anti-piracy operations**, expanding the Indian Navy’s operational reach.

### Key facts about Naval Innovation and Indigenisation Organisation :

- It is a **three-tiered** organization launched by **the Defence Ministry**. **Naval Technology Acceleration Council (N-TAC)** will bring together the twin aspects of innovation and indigenisation and provide apex level directives.
- A working group under the N-TAC will implement the projects. A **Technology Development Acceleration Cell (TDAC)** has also been created for induction of emerging disruptive technology in an accelerated time frame.



## 20. Key drivers of Groundwater Depletion

- A recent study shows significant groundwater depletion in five Indian states.

### What is groundwater?

- **Groundwater** – It is the water found underground in the cracks and spaces in soil, sand and rock.
- It is stored in and moves slowly through geologic formations of soil, sand and rocks called aquifers.
- **Speed of groundwater flows** – It depends on the size of the spaces in the soil or rock and how well the spaces are connected.
- **Groundwater recharge** – They are recharged by rain and snow melt that seeps down into the cracks and crevices beneath the land's surface.
- 'Groundwater' is often referred to as the hidden lifeblood of our planet, essential for sustaining agriculture, industry, and communities.
- **Groundwater depletion** – It occurs when groundwater is extracted faster than it can be replenished.
  - Groundwater, constituting 62% of irrigation and 85% of rural water supply.

### Key drivers of groundwater depletion

- **Agricultural exploitation** – It dominates groundwater consumption, especially with high water-demand crops like paddy & sugarcane.
- Farmers continue to favor these crops for financial returns, even in arid regions, leading to excessive extraction.
- In regions like Punjab and Haryana, traditional agricultural practices remain highly dependent on groundwater.
- **Energy subsidies** – Power subsidies in agriculture have incentivized unregulated pumping, adding to groundwater depletion.
- **Green revolution legacy** – High-yield crops introduced during the green revolution remain prevalent, adding pressure to already vulnerable regions.
- **Unregulated industrial use** – Rapid industrialization has led to unmonitored groundwater extraction across all affected states.
- Industries often have high water demands, especially those involved in manufacturing, textile processing, and other water-intensive sectors.
- **Population growth** – As population grows, they require substantial amounts of water for drinking, sanitation, and other domestic uses.

### Impacts

- **Water scarcity** – It reduces water availability thereby impacting sustenance of living organisms.
- **Public health issues** - People may turn to unsafe sources, risking exposure to contaminants like arsenic.
- **Food insecurity** - Overexploitation of groundwater resources has led to large-scale depletion in key food producing countries, cascading impacts for global food security.
- **Impact on livelihood** - Marginalized section of people who cannot afford alternative water sources will have impact on their incomes.
- **Ecosystem damage** - It affects vegetation, wildlife, and wetland habitats that depend on consistent water levels.
- **Biodiversity crisis** - It leads to reduction in biodiversity, impacting flora and fauna and threatening overall ecological balance.

### Government measures

- **Statutory measures** - The Water (Prevention and Control of Pollution) Act 1974 aims to provide for the prevention and control of water pollution, and for the maintaining or restoring of wholesomeness of water in the country.
- **Policy measures** - National Water Policy (2012) promotes efficient water use across all sectors.
- **Institutional measures** - Bureau of Water Use Efficiency (BWUE) formed under the National Water Mission develops standards for water-efficient products and practices.
- Central Ground Water Authority (CGWA) regulates large-scale groundwater extraction.
- **Water management initiatives** - Jal Shakti Abhiyan (JSA) focuses on rainwater harvesting and groundwater recharge under Catch the Rain initiative.
- Amrit Sarovar Mission aims to rejuvenate and develop 75 water bodies in each district of the countries.

### 21. Key facts about Wind Energy Generation in India

- **In August 2024**, the Tamil Nadu government introduced the “**Repowering, Refurbishment, and Life Extension Policy**” to replace **old turbines** and **optimise wind energy use**. However, wind energy generators have opposed the policy, approached the **Madras High Court** and got a stay.

## What is Tamil Nadu Repowering, Refurbishment & Life Extension Policy for Wind Power Projects, 2024?

- **Context:** Wind energy generators in **Tamil Nadu** with windmills older than **20 years** needed upgradation for energy efficiency.
- **Policy Focus:** The policy includes **three major aspects**: **Life Extension:** Extending the operational life of windmills **over 20 years old**. **Repowering:** Replacing **old windmills** with new machines. **Refurbishment:** Upgrading or **repairing** old windmills.
- **Capacity Overview:** Approximately **300 MW** of the 9,000 MW wind energy capacity in Tamil Nadu is **over 20 years old**.
- **Reason for Opposition:** For life extension, wind energy generators are expected to pay **Rs 30 lakhs per MW every five years**. For repowering, a one-time payment of **Rs 30 lakhs per MW** is required to replace old machines with new ones.

## What are the Key Facts About Wind Energy in India?

- **Wind Energy Potential:** India has a wind power potential of **1,163.86 GW** at **150 metres** above ground level while at a **120-metre** turbine height, it is **695.51 GW**.
- **Wind Energy Utilisation:** Only about **6.5%** of India's wind potential is used at the national level and **nearly 15% in Tamil Nadu**.
- **Wind Power Generation:** India has been **ranked 4th in wind power capacity** and **fourth in renewable energy installed capacity**, as of **2024**.

## Challenges in Repowering and Refurbishing Wind Turbines

- **Land requirements:** New turbines, especially those with higher capacities (2 MW and 2.5 MW), **require more land (3.5 to 5 acres)** compared to older, smaller turbines.
- **Displacement:** Since the 1980s when turbines were installed, habitats have come up between wind sites which pose **new challenges of displacement and rehabilitation** of population.
- **Technology Evolution:** Upgrading turbines, blades, and gearboxes to keep pace with advances requires significant **investment, time, and expertise**.
- **Banking issue:** Wind turbines installed after **2018** in Tamil Nadu **do not have banking facilities**, meaning that repowered turbines are treated as new installations, and generators cannot bank the energy generated, affecting financial viability.

## Way Forward

- **Improved Tariff Mechanism:** Offering **competitive renewable tariffs** will ensure stable pricing and reduce financial risks for project developers.
- **Completion Deadlines:** Ensuring strict adherence to **project completion timelines** will prevent delays, improve project efficiencies, and enhance the **credibility of the wind energy sector**.
- **Integration with Solar Energy:** India must focus on improving **solar-wind grid integration** to harness energy during periods when solar generation is low, such as at night.
- **Transmission Infrastructure:** Investing in advanced energy storage systems and **upgrading transmission infrastructure** will maximise wind energy efficiency.

## 22. Dedicated Freight Corridors for Transforming India's Economic Landscape

- Recent study by the University of New South Wales analyzed the impact of DFCs on India's economy, particularly the WDFC.

### Dedicated freight corridor

- **Dedicated Freight Corridors (DFCs)** - They are specialized rail routes created solely for the transportation of freight, independent of passenger rail traffic.
- **Exclusive for Freight** - Unlike mixed-use rail networks, DFCs focus exclusively on freight, allowing for the transit of heavier, longer, and double-stack container trains at higher speeds.
- **Dedicated Freight Corridor Corporation of India Limited** - To undertake planning & development, mobilization of financial resources, construction, operation & maintenance, and business development of the dedicated freight corridors.
- **Significance** - The primary goal of these corridors is to increase the efficiency, speed, and capacity of freight transportation across the country.

### DFCs are vital for economic Growth

- **Enhanced Freight Efficiency** - DFCs allow faster and more efficient freight transportation, which is critical for industrial productivity.
- **Improves Industrial Productivity** - DFCs enable industries to maintain leaner inventories and rely on timely deliveries, reducing costs across the supply chain.
- **Logistic Cost Reduction** - Dedicated freight route reduces the transportation cost of goods.

- **Reduction in Commodity Price** - With reduced travel time and costs, the DFCs have directly impacted commodity prices, making goods more affordable.
- According to an Australian study, freight cost reduction on the DFCs has led to a 0.5% decrease in the prices of transported goods, which has positive ripple effects across various sectors of the economy.
- **Reduce Rail Congestion** - Over 52% of passenger traffic and 58% of freight traffic concentrated on just 16% of the rail route length.

### Way forward

- Create an integrated freight network and enhance India's economic resilience.
- Conduct comprehensive studies to quantify the economic impact of DFCs and identify ways to optimize future corridor designs and operational strategies.
- Promotion of multimodal logistics to integrate other mode of transports with freight corridors.
- As DFCCIL continues its work, and studies validate the DFCs' impact, these corridors will shape India's industrial landscape, fostering regional equity and sustainable growth for decades to come.

### 23. On improving wind energy generation

- Tamil Nadu, a leader in wind energy with turbines over 30 years old, introduced a new policy for upgrading old windmills in August 2024. However, wind energy producers opposed it, took the issue to the Madras High Court, and obtained a stay.
- **Installed Capacity:** As of November 2023, Tamil Nadu has an installed wind energy capacity of approximately 10,377.97 MW, making it the second-largest wind energy producer in India after Gujarat. This represents about 23% of India's total installed wind capacity.
- **Age of Turbines:** Many turbines in Tamil Nadu are over 30 years old, which raises concerns about efficiency and technological advancements.
- **Potential for Repowering:** The state has a repowering potential of over 7,387 MW, which could significantly enhance its energy generation capabilities if older turbines are replaced or refurbished.

### National wind energy capacity

- **Total Potential:** The National Institute of Wind Energy (NIWE) estimates that India has a wind power potential of **1,163.86 GW** at a height of **150 meters**, ranking fourth globally for installed capacity.

- **Current Utilization:** At 120 meters (the standard height for modern turbines), India's potential is around 695.51 GW, with only about 6.5% currently utilized nationally and nearly 15% in Tamil Nadu.
- **Leading States:** The states contributing most to India's wind power include Gujarat, Tamil Nadu, Karnataka, Maharashtra, Rajasthan, and Andhra Pradesh, which collectively account for approximately 93.37% of the country's installed capacity.

### What does the repowering and refurbishing of wind turbines mean?

- Repowering involves replacing old turbines with new ones to enhance efficiency and output. Refurbishing includes upgrading components like gearboxes and blades to improve performance without complete replacement.
- **Regulatory Framework:** The Tamil Nadu government introduced a new policy aimed at facilitating these processes. However, generators argue that the policy lacks provisions that effectively promote wind energy generation and financial viability.
- **Concerns from Generators:** Wind energy generators have opposed the new "Tamil Nadu Repowering, Refurbishment and Life Extension Policy for Wind Power Projects - 2024", claiming it does not adequately support the promotion of wind energy generation. They have approached the Madras High Court and received a stay on the policy implementation.
- **Financial Viability Issues:** The opposition stems from concerns that repowered turbines will be treated as new installations without banking facilities for generated energy, impacting financial returns on investments. Generators emphasize that without a commercially beneficial framework, investments in repowering will decline.

### Way forward:

- **Revise the Policy to Ensure Financial Viability:** The Tamil Nadu government should amend the policy to provide incentives like banking facilities for energy generated from repowered turbines, making the projects financially viable for investors.
- **Promote Technological Advancements and Infrastructure Upgrades:** The policy should focus on facilitating the replacement of old turbines with modern, high-capacity ones and improving wind energy transmission infrastructure to harness the full potential of Tamil Nadu's wind resources.

## 24. More Foreign Portfolio Investors Set to enter Indian Market

- The sustained sell-off by foreign portfolio investors (FPIs) since October this year hasn't deterred new FPIs from seeking permission to invest in Indian

markets. Applications of about 40-50 new FPI registrations have come to the market regulator Securities and Exchange Board of India (Sebi) during the month.

- The number of FPIs registered with the Sebi was 11,219 as of March 2024. Only 138 FPIs had registered with the Sebi in full fiscal 2023-24. This means an average of 12-13 FPI registrations every month.

### **Foreign Portfolio Investors (FPI)**

- FPIs are investors from foreign countries who invest in a country's financial assets, including stocks, bonds, and mutual funds, without obtaining control over the companies in which they invest.
- FPIs can be institutional investors like mutual funds, hedge funds, pension funds, and insurance companies, as well as individual investors.

### **Key Characteristics:**

- **Portfolio Investments:** FPIs invest in securities and other financial assets, not in physical assets or direct ownership.
- **Short-term Focus:** FPIs typically focus on short-to-medium term returns, unlike Foreign Direct Investment (FDI), which is more long-term.
- **High Liquidity:** FPIs can be quickly liquidated, which makes them sensitive to market volatility.

### **FPI Regulations in India:**

- Regulated by the Securities and Exchange Board of India (SEBI) under the SEBI (FPI) Regulations, 2019.
- FPIs must register with SEBI to invest in Indian markets.

### **Reasons for FPI Optimism Towards India:**

- **SEBI has recently relaxed norms for Non-Resident Indians (NRIs),** allowing up to 100% participation and simplifying entry and operational procedures, boosting FPI interest in Indian markets.
- **Political Stability:** Long-term political certainty supports investor confidence.
- **Economic Growth Potential:** India offers attractive long-term growth prospects and yields.
- **Capex Spending:** Significant capital expenditure by the Indian government is expected to fuel growth.
- **RBI's Vigilant Approach:** The central bank's cautious interest rate adjustments help control inflation and provide stability for fund-raising in India Inc.

- Impact of U.S.-India Strategic Relations: The recent U.S. election results have spurred optimism due to the strategic partnership between the two nations, which may positively influence trade policies and attract further FPI inflows.

## 25. Antariksha Abhyas - 2024

- India has launched its first-ever space exercise, **Antariksha Abhyas - 2024**, to address the growing challenges to space-based assets and ensure the integration of its space capabilities with military operations.

**Antariksha Abhyas - 2024: Organized by: Defence Space Agency** under Headquarters Integrated Defence Staff. **Location:** New Delhi.

- **Purpose:** War-game threats to and from space-based assets and services. Enhance understanding of operational dependency on space assets. Identify vulnerabilities in space operations during disruptions or denials.
- **Participants:** Defence Space Agency and allied units. **Army, Navy, Air Force, Defence Cyber Agency, Defence Intelligence Agency, and Strategic Forces Command.** Representatives from **ISRO and DRDO.**
- **Significance:** Establishes India's commitment to securing national interests in space. Highlights the need for cutting-edge innovation and collaboration with ISRO, DRDO, and academia. Reinforces preparedness for the increasingly contested and competitive nature of space.

### Defence Space Agency:

- **Headquarters:** Bengaluru, Karnataka, India.
- **Purpose:** Operates space warfare and satellite intelligence assets of the Indian Armed Forces. Draws personnel from the Army, Navy, and Air Force.
- **Historical background:** Originates from recommendations of the **Naresh Chandra Task Force (2012)**, which suggested creating tri-service commands for cyber, aerospace, and special operations. **Approved in 2018** by Prime Minister Narendra Modi during the Combined Commanders' Conference.
- **Integrated facilities:** Subsumed the **Defence Imagery Processing and Analysis Centre (Delhi)** and **Defence Satellite Control Centre (Bhopal)**.

## 26. RBI Releases List of Domestic Systemically Important Banks (D-SIBs)

- RBI has retained State Bank of India (SBI), HDFC Bank, and ICICI Bank as Domestic Systemically Important Banks (D-SIBs) for 2024 under the same bucket structure as in 2023. SBI and ICICI were classified as **D-SIBs in 2015 and 2016**, respectively, while **HDFC joined in 2017**.



## Domestic Systemically Important Banks (D-SIBs)

- The Reserve Bank of India (RBI) designates D-SIB status to banks that are considered “**Too Big to Fail**” due to their size, complexity, and interconnectedness within the financial system.
- The D-SIB classification is updated annually based on the framework set by RBI in 2014.
- The Reserve Bank of India (RBI) has categorized banks into **five buckets based on their risk profiles and capital requirements**. This categorization is primarily based on their **Additional Common Equity Tier 1 (CET1) ratio to Risk Weighted Assets (RWAs)**. Banks in **Bucket 1 must maintain the lowest Common Equity Tier 1 (CET1) capital** surcharge, while those in **Bucket 5 have to maintain the highest CET1 buffer**. RBI evaluates banks over **2% of GDP in size** to determine systemic importance. Banks above a threshold are classified as D-SIBs and assigned a bucket, determining their CET1 requirements.
- **Foreign Banks Operating in India:** The Financial Stability Board, with other global regulators, identifies Global Systemically Important Banks (G-SIBs) annually. Foreign banks designated as (G-SIBs) must maintain CET1 capital in India proportional to their Risk Weighted Assets (RWAs) in the country.

## Benefits of the D-SIB Classification

- **Enhanced Stability:** Large banks with complex operations are essential for providing continuous financial services. By requiring higher capital reserves, the RBI ensures that D-SIBs are better equipped to handle economic downturns, protecting depositors and maintaining confidence in the banking system.
- **Systemic Safeguards:** The classification encourages sound risk management practices among major banks, lowering the risk of disruptive bank failures.
- **Preparedness for Future Shocks:** The RBI’s D-SIB framework allows proactive adjustments to banks’ capital requirements, enabling the financial system to respond more effectively to future challenges.

## Challenges

- **Moral Hazard:** The “Too Big to Fail” perception can create expectations of government support for D-SIBs in times of crisis, which may inadvertently encourage risk-taking and reduce market discipline.
- **Competitive Distortions:** Smaller banks, which are not classified as D-SIBs, may find it difficult to compete against these large institutions that benefit from investor confidence and market advantages tied to their perceived stability

- **Increased Costs:** Higher capital requirements may lead to increased operational costs for D-SIBs, potentially affecting their profitability and competitive positioning in the banking industry.

### Conclusion and Way Forward

- The D-SIB classification remains a vital tool for safeguarding India's financial stability, ensuring that essential banking services remain available even during economic challenges. As India's economy grows and its financial landscape evolves, the RBI's D-SIB framework may continue to expand, potentially adding more institutions to the list.
- With proactive regulation and risk management, D-SIBs will likely continue to play a pivotal role in supporting India's economic growth and resilience.

### 27. Reclassification and new regulatory framework of FPI to FDI

- The Reserve Bank of India (RBI) introduced a streamlined operational framework to allow foreign portfolio investors (FPIs) to convert their investments to foreign direct investment (FDI).
- Foreign investment in India is governed by sub-section (3) of Section 6 of the Foreign Exchange Management Act, 1999.

### New regulatory framework on FPI

- **FPI threshold** - Under Foreign Exchange Management (Non-debt Instruments) Rules, 2019, investment made by the FPI should be less than **10%** of the total paid-up equity capital.
- **Crossing threshold** - FPIs exceeding a **10% stake** in a company must divesting their holdings or reclassifying such holdings as within 5 trading days following the transaction that breaches the limit.
- **Approvals** - It is subject to approvals from both the Indian government and the invested company.

### Implications of the framework

- **Streamline foreign investments** - Providing a structured path to retain the investment, When an FPI, along with its investor group, inadvertently crosses the threshold.
- **Market stability** - This shift could bring more stability and reduce market volatility associated with short-term foreign investments.
- **Enhanced governance** - The compliance requirements, especially those related to beneficial ownership, improve transparency in the market.

- **Increased compliance costs** - Stricter disclosure norms and other regulatory requirements increase compliance costs for foreign investors.
- **Promotion of long-term investment** - By encouraging FPIs to convert substantial investments into FDI, the government aims to promote long-term foreign investments.
- **Change in investment patterns** - The restrictions may redirect FPI interest toward non-sensitive sectors with fewer ownership caps.
- Sensitive sectors might experience reduced foreign investment due to regulatory hurdles and caps on ownership.
- **Prevent tax evasion** - The rules aimed to prevent any attempts at tax evasion or money laundering.

### Way forward

- Focus on maintaining transparency while ensuring India remains competitive in attracting foreign capital.
- Reduce market volatility to make resilient economic foundation less susceptible to short-term market shocks.

## 28. The Need for Increased Climate Finance from Developed Nations

- At COP29 in Baku, Avinash Persaud, a leading climate economist, has urged developed nations to **significantly increase their climate finance commitments**. He emphasizes that without a substantial rise in funding, the credibility of global climate finance efforts will be undermined. This call comes as the **current \$100 billion-a-year climate finance mechanism is set to end**, and a new target for climate finance is being established.

### Need for Increased Climate Finance:

- Developed nations are currently expected to contribute **\$100 billion annually for climate finance**.
- The **\$100 billion goal has not been consistently met**, leading to concerns about credibility.
- The existing **\$100 billion annual mechanism** will end next year, with nations required to replace it with the **New Collective Quantifiable Goal (NCQG)**.
- Climate experts emphasize the need to increase contributions to **\$300 billion or more to ensure credibility and encourage global participation**.

### Funding Needs of Developing Nations:

- Developing nations estimate a requirement of over \$1 trillion annually for a just transition to a lower-emission economy.
- Climate finance from **multilateral development banks (MDBs)** is seen as a crucial component, leveraging every dollar up to 7-8 times.
- **Despite MDBs' efforts, there is a shortfall, and funding often does not reach the most vulnerable regions.** In 2023:44% of MDB climate finance was allocated to Europe. Sub-Saharan Africa received only 14%, and Asia-Pacific 21%.

### Challenges in Climate Finance Allocation:

- A significant portion of climate finance has been **directed to projects with questionable environmental impacts**, such as: Waste-to-energy plants emitting greenhouse gases. Projects involving captive coal, leading to increased debt for already burdened countries.
- There is a call for **improved allocation to ensure that funds support genuinely sustainable and low-emission projects.**

### Article 6.4 and Global Carbon Markets:

- **Article 6.4**, a key component of global carbon markets, has faced criticism for favouring untested technologies like carbon capture.
- **Article 6.4 of the Paris Agreement** establishes a mechanism for **carbon crediting** aimed at helping countries achieve their climate goals through international cooperation.
- This provision is part of a **broader set of tools under Article 6**, which allows countries to engage in carbon markets or other cooperative measures to enhance climate ambition and reach emission reduction targets.
- Article 6.4 enables the **generation of carbon credits through projects that reduce greenhouse gas emissions.** These projects must adhere to **specific standards of verification and transparency** to ensure integrity.
- **Verified emission reductions** can then be used by countries to meet their **Nationally Determined Contributions (NDCs) under the Paris Agreement.**
- **Supervisory Body:** A dedicated **Supervisory Body** oversees the mechanism, ensuring that all activities meet the set requirements. It is **responsible for validating and verifying emission reduction projects**, making sure they follow established standards.

### Proposed Solutions for Effective Climate Finance:

- **Increase the credibility of climate finance** by ensuring developed nations meet or exceed the target of **\$300 billion annually.**
- Utilize **multilateral development banks (MDBs)** to multiply financial contributions.

- **Establish enforceable mechanisms for cross-border carbon trading** to ensure higher prices and effective market functioning.
- **Focus on transparent and equitable carbon border adjustment systems** to avoid disproportionately impacting developing economies.

### 29. Measures taken to achieve self-sufficiency in fertilizers

- With the crisis continuing in Ukraine and Gaza, experts and policymakers are concerned about further increase in the prices of the components used for making petroleum-based chemical fertilizers.

#### Challenges in fertilizer imports in India

- **Geopolitical tension** - The rising conflicts such as in Russia - Ukraine and Gaza have disrupted fertilizer imports.
- **Price volatility** - Fluctuation in crude oil prices, could increase fertilizer production costs.
- **Rise in import bill** - When fertilizer cost increases it further burdens exchequer on budgetary allocations.
- **Supply chain vulnerabilities** - Delays in shipments due to geopolitical tensions directly affect India's agricultural sector.

#### What are the measures taken to achieve self-sufficiency in fertilizers?

- **Upgrading fertilizer plants** - Plants in regions like Gorakhpur and Ramagundam have been revitalized with advanced, energy-efficient technology.
- **Self-sufficiency in urea** - The Union government has set 2025-26 as the deadline by which the country will end all urea imports.

Urea accounts for about 70% of the overall fertiliser subsidy bill.

- **Nano urea production** - Six Nano Urea plants and four Nano DAP plants have been set up in the country
- **Organic farming** - Paramparagat Krishi Vikas Yojana (PKVY) promotes organic farming and offers Rs 50,000 per hectare for three years, with Rs 31,000 directly allocated to farmers for organic inputs.
- **Sustainable agriculture** - National Mission for Sustainable Agriculture (NMSA) implements strategies to make Indian agriculture more resilient to climate change.
- **Neem coated fertilizer** - 100% Neem coating of subsidized urea is mandated to enhance efficiency and prevent misuse.

- **One Nation, One Fertiliser** – Pradhan Mantri Bhartiya Jan Urvarak Pariyojana scheme aims to implement One Nation One Fertilizer by introducing Single Brand for Fertilizers and Logo.
- **Alternate fertilizers** – PM Promotion of Alternative Nutrients for Agriculture Management (PM PRANAM) promotes balanced and sustainable use of chemical fertilisers, adopting alternative options like organic, nano, and bio-fertilisers, and encouraging natural and organic farming.

### **What measures can be taken to achieve self-sufficiency in fertilizer production?**

- **Revival and modernization of plants** – Focus on reopening defunct plants and modernizing existing ones to increase production capacity.
- **Research and innovation** – Promote nano fertilizers to precise delivery of nutrients with increased efficiency and reduced wastage.
- **International collaborations** – Encourage collaboration of Indian companies with global fertilizer producers to integrate cutting-edge technology.
- **Policy reforms and incentives** – Increase public, co-operatives, private participation in fertilizer production by providing various incentives, including subsidies, tax relief, and funding support.
- **Import diversification** – Diversify the import sources to mitigate risks associated with over-reliance on a single supplier.
- **Eco-friendly alternatives** – Promotes eco-friendly and organic fertilizers to reduce the environmental impact of chemical fertilizers.

### **30. Centre reimposes AFSPA in 6 'volatile' regions**

- Eighteen months after ethnic violence began in Manipur, the Central government has reinstated the Disturbed Areas status under the **Armed Forces (Special Powers) Act (AFSPA)** in six police station jurisdictions, including the affected area of Jiribam.

### **Significance of the Armed Forces (Special Powers) Act, of 1958**

- **Extraordinary Powers:** AFSPA grants armed forces significant powers, including the authority to arrest without a warrant, search premises, and use lethal force if deemed necessary. These powers are intended to facilitate military operations in volatile regions.
- **Legal Immunity:** The Act provides immunity from prosecution for armed forces personnel acting under its provisions unless sanctioned by the central government. This aspect has led to widespread criticism and allegations of human rights abuses.
- **Controversy and Criticism:** AFSPA has been a subject of intense debate due to its implications for civil liberties. Critics argue that it leads to extrajudicial

killings and other human rights violations. High-profile incidents have fueled calls for its repeal or reform, with activists like Irom Sharmila famously protesting against it for years.

### What is the present controversy around the provisions of AFSPA?

- **Human Rights Violations:** AFSPA has been associated with numerous human rights abuses, including extrajudicial killings, torture, and enforced disappearances.
  - Reports indicate that over 1,500 extrajudicial killings occurred in Manipur alone between 2000 and 2012, often involving security forces acting with impunity due to the protections afforded by the Act.
- **Impunity for Security Forces:** This Act provides armed forces personnel with legal immunity for actions taken under its provisions, requiring prior approval from the central government for prosecution.
  - This has led to a culture of impunity (exemption from punishment) where security personnel are rarely held accountable for their actions, exacerbating public distrust and resentment towards the military.
- **Excessive Use of Force:** AFSPA grants security forces broad powers to use lethal force against individuals deemed to be acting against the law.
  - Critics argue that this provision leads to excessive and disproportionate responses, often resulting in civilian casualties and further violence in already tense regions.
- **Lack of Accountability and Oversight:** The absence of effective mechanisms for accountability regarding human rights violations under AFSPA has been a significant concern.
- Despite recommendations from various committees for reforms or repeal of the Act, the government has largely ignored these calls, perpetuating a cycle of abuse without adequate oversight.
- **Political and Social Backlash:** The ongoing application of AFSPA has sparked significant protests and activism, particularly in northeastern states like Manipur and Nagaland.
- Activists, including prominent figures like Irom Sharmila, have campaigned for its repeal, arguing that it fosters alienation among local populations and undermines democratic values in India.

### Way forward:

- **Balancing Security with Rights:** Reform AFSPA to incorporate provisions ensuring accountability and oversight, such as independent inquiries into alleged violations and regular reviews of its application, while retaining necessary powers to address security challenges.

- **Strengthening Local Governance:** Enhance the capacity of state police and local administrations through training and resources, enabling them to manage law and order effectively, thereby reducing reliance on AFSPA over time.

