

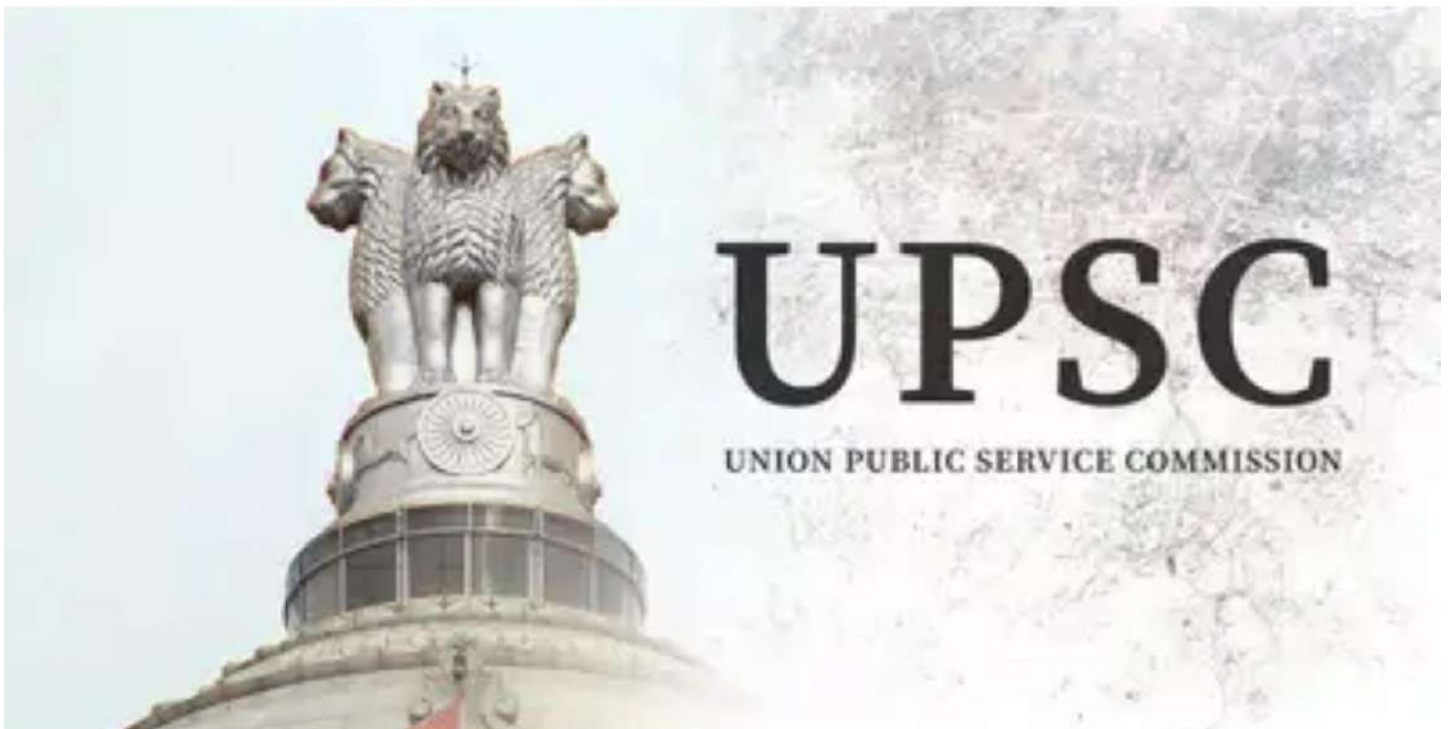


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# CURRENT AFFAIRS MAGAZINE

**JULY 2025**

News Analysis



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## July 2025

### 1. IMPORTANT TOPICS OF THE MONTH

#### 1.1 School Mental Health Program

##### Why in the News?

India finds itself at a critical juncture concerning mental health, with the most recent surveys and studies painting a stark picture.

##### What is the status of mental health issues faced by students?

- **National Mental Health Data** - Approximately 10.6% of the population has grappled with mental health issues at some point, with 13.7% currently affected as of then, as per National Mental Health Survey 2015-2016.
- **Mental Health Issues of Children**- 27% of children and adolescents experienced depression, 26% had anxiety disorders, 7% exhibited hyperactivity.
- 9%, 19%, and 15% experienced emotional, conduct, and peer problems, respectively.
- **Student Suicide Rate** – It is at high rate of 7.6% as per National Crime Record Bureau (2022).
- **Increase in Student Suicides** - There has been 32% increase from 2017 to 2022.
- **Internet Addiction** - A study published in General Psychiatry (2021) found that internet addiction among students in 19 states of India ranges from 19.9% to 40.7%.
- This high prevalence highlights the growing issue of internet dependency among young people in the country.
- **Behavioural Addictions** – There is excessive use of social media, video games, online pornography, and mobile phones among Indian youth.

**National Mental Health Survey (NMHS 1)** was conducted in 2015-16 in 12 states and preparations for NMHS 2 are underway.

##### What are the impacts of these mental health issues?

- **Poor Academic Performance** - Difficulty concentrating, decreased motivation, and impaired cognitive function can lead to lower grades, increased stress, and potential academic setbacks.
- **Sleep Disturbances** – Internet addiction, excessive use of social media and dooms scrolling affect sleeping patterns, cycle and quality of sleep.
- **Emotional Dysregulation** – These addictions causes can increased reactivity, irritability, and impulsivity, impacting relationships, including family interactions.
- **Familial Conflict** - Mental health issues can strain relationships with family members, leading to increased tension, arguments, and a breakdown in communication.

##### What are the challenges in addressing mental health issues?

- **Non-recognition** - Mental health conditions are often not identified or addressed promptly, leading to prolonged suffering and potential worsening of symptoms.
- **Inadequate Health Services** - Only 29% of individuals with psychiatric disorders receive treatment, leaving 71% untreated, National Mental Health Survey.
- This gap underscores the mismatch between demand and supply in mental health services.
- **Stigma** - The stigma associated with mental illness prevents individuals from seeking help due to fear of judgment, discrimination, or social exclusion.
- **Lack of awareness** - Limited knowledge about mental health conditions, their symptoms, and available treatments hinders early identification and appropriate intervention.
- **Insufficient Mental Health Education** - Mental health is often treated as a separate issue from general health, leading to a lack of integration into school curricula and discussions.
- This can result in missed opportunities to educate students about mental well-being and provide support.

##### What are the significances of school mental health programs?

- **Vital Role** - The World Mental Health Report (2022), WHO, emphasises the vital role of schools in addressing mental health issues through education, supportive environments, and collaboration with health services.
- **Promoting Mental Health Awareness** - World Health Organization's Comprehensive Mental Health Action Plan 2013–2030, emphasise the pivotal role of schools in promoting mental health awareness and supporting adolescents.
- **Promoting Mental Well-Being** - School programs can teach students how to manage stress, build resilience, and develop positive coping mechanisms.
- **Preventing Mental Illnesses** - Early intervention through school programs can help identify and address mental health concerns before they escalate into more serious conditions.
- **Reducing Stigma** - Mental health programs can educate students, staff, and families about mental health conditions, challenging misconceptions and reducing the stigma associated with seeking help.
- **Creating Inclusive Environment** - Open discussions and positive messaging can create a more inclusive and supportive school environment.
- **Enhancing Community Mental Health**- When schools prioritize mental health, they contribute to a healthier community overall.

### Mental Health Initiatives in India

- **National Mental Health Programme (NMHP)** – It was launched in 1982 to ensure the availability and accessibility of minimum mental healthcare for all.
- **District Mental Health Program (DMHP)** – It was launched under NMHP in the year 1996 (in IX Five Year Plan) for providing mental healthcare services at the district level, including outreach programs, training for medical officers, and community-based interventions.
- **National Tele Mental Health Programme (Tele MANAS)** - Launched on October 10, 2022, It provides a 24/7 toll-free helpline (14416 or 1800-89-14416) for mental health support in various Indian languages.
- **Ayushman Bharat** - Mental health services are integrated into the comprehensive primary health care package offered under AB Health and Wellness component.
- **Mental Healthcare Act, 2017** -This act provides a legal framework for protecting the rights of individuals with mental illnesses and ensuring access to appropriate care.

### What are the key strategies in implementation of school mental health program?

- **Integrating Mental Health and Education Services** - Given India's vast student population, integrating digital mental health services like the nationwide helpline Tele-MANAS (1-800-891-4416) in educational institutions is essential.
- **Establishing an Advisory Board** - A Mental Health Advisory Board (MHAB) comprising trained teachers under institutional leadership can facilitate structured mental health initiatives.
- **Mental Health Orientations** - Schools can conduct mental health orientations for teachers and students, fostering resilience through workshops and peer support.
- **Reducing Exam Pressure** - Providing structured psychological support before, during, and after exams can help students manage anxiety and distress.
- **Fostering Stress-free Communications** - Parents and teachers can adopt such strategies to foster a positive environment, emphasising that education is just one aspect of personal growth and development.
- **Awareness Creation** - Institutions can promote helplines such as Tele-MANAS and others to ensure students seek timely support.
- Since media plays a vital role, weekly editions of educative, informative and skill-building editorials, along with dedicated sections in local language newspapers can be published.
- **Embedding Mental Health Initiatives in Education** – It will foster student well-being, resilience and academic success, creating a more inclusive learning environment.
- **Capacity Building at Grassroot Level** - District mental health teams can train ASHA and Anganwadi workers in illness identification, psychological first aid for children and mothers and referral to advanced mental health services if needed.

- **Mental Health Audit** - To prioritise mental health in education, mental health audits can be included in the accreditation process of educational institutions from primary to higher education.

### What lies ahead?

- To bridge the gaps in mental health services, policy-makers need to focus on community-based services and school mental health initiatives.
- Urgent investment in mental health is crucial to reduce disparities and address this escalating crisis.
- It is essential for stakeholders, such as governmental bodies, policy-makers, educational institutions, parents, students, media, and researchers, to prioritise mental health care.
- Integrating mental health education, resilience building, and coping skill training into regular school and college activities and school curricula will create a supportive environment for mental wellbeing.
- School-based suicide prevention, early socio-emotional skills development and anti-bullying programmes are essential components of comprehensive mental health strategies.

## 1.2 Performance of New Criminal Laws

### Why in the News?

*It has been a year since the British era criminal laws were replaced by the three new criminal laws on July 1, 2024.*

### How are the new laws being implemented?

- **Cases Filed** - According to data from the MHA, police departments have registered a total of 35, 18,544 (3.5 million) FIRs under BNS between July 1 last year till June 25.
- In comparison, 35, 61,279 (3.5 million) and 36, 63,630 (3.6 million) FIRs were filed across the country in 2022 and 2021, respectively, according to the National Crime Records Bureau (NCRB) data.

### Key Changes in the New Laws

- The ability to file a complaint anywhere
- Online registration of such complaints
- The issue of summons through electronic modes such as SMS
- Mandatory videography of crime scenes for all heinous crimes
- 20 years of punishment in gang rape cases (a possible death penalty if the victim is below 12 years of age)
- New crimes such as mob lynching
- Allows trial in absentia of fugitive criminals.
- Repeal archaic provisions such as homosexuality, adultery, attempt to commit suicide and sedition.
- While the term "sedition" is dropped, the new provision, found in Section 152 of the BNS, criminalizes acts that excite or attempt to excite secession, armed rebellion, or subversive activities.

- **Training of Human Resources** - MHA data suggests that out of about 20 lakh police officers in all states/UTs in the country, about 8.6 lakh have already been trained in the new laws.
- **Increase in Forensic Personnel** - Since the new laws focus heavily on collection of forensic evidence, the state forensic science laboratories (FSLs) across the country have hired 2,649 forensic professionals on contract.
- For modernisation and upgradation of FSLs in 24 states/UTs, Rs.215.66 crore has been allocated.
- **Enhancement in Digital Infrastructure** – The capacity has been increased in the last one year for storing electronic evidence, as collecting such evidence is mandatory now in the law

### What are the pillars of the implementation of new criminal laws?

- **Inter-operable Criminal Justice System (ICJS)** – It is a national platform designed to integrate the main IT systems used by the five key pillars of the criminal justice system in India.
  - Police (CCTNS)
  - Courts (e-Courts)

- Jails (e-Prisons)
- Forensic Labs (e-Forensics)
- Prosecution (e-Prosecution).
- **Upgradation of CCTNS portal** – Most first information reports (FIRs) are registered through the Crime and Criminal Tracking Network and Systems (CCTNS).
- **e-Sakshya** – It is making a big difference on the ground, for the transition to the new provisions of law.
- **Nyay Setu** – It has been introduced as a dedicated digital platform for the police to streamline operations and enhance inter-agency coordination.
- **iGOT Karamyogi** - Officials had been on board the Karamyogi portal and they were being provided extensive training.
- Hands-on training for using new applications was also imparted to all SHOs, IOs and computer operators.
- **QR codes** – They are used for property and messenger details to ensure chain of custody.

### How does e-Sakshya aid in the implementation of the new laws?

- **The eSakshya app** – It is a pivotal mobile application designed to assist police in recording and managing evidence in criminal cases.
- This app has been developed by the National Informatics Centre (NIC) in consultation with the MHA.
- **Digitizes India's Criminal Justice System** - As part of India's broader digital transformation, this app aligns with new criminal laws aimed at modernizing the jus tice system.
- **Evidence Management** - The app allows police officers to record the scene of a crime, including search and seizure activities, directly from their mobile phones.
- Investigating Officers (IOs) can use it to capture pictures and videos on the spot, with geo-coordinates and a time stamp.
- **Facilitates Uniformity in Investigation** - eSakshya plays a crucial role in ensuring uniformity in investigations across states, which is expected to enhance the conviction rate.
- **Enables Compliance with BBNS** - The app supports compliance with the Bharatiya Nagarik Suraksha Sanhita (BNSS) requirements for audiovisual recording and forensic examination in serious offenses.
- **Enhances Procedural Integrity** – IOs cannot even (unofficially) depute their subordinates to carry out an investigation in their name.
- The provision of capturing a 'selfie' by the IO has been a deterrent and is likely to improve the overall quality of an investigation.
- **Ensures Forensic Analysis** – Through the app, the IO now ensures that the scene of crime is mandatorily inspected by a forensic science laboratories (FSLs) expert.

*The **BNSS** makes it mandatory for the IO to record certain processes using audio-video electronic means.*

### What are the impediments in the implementing the laws?

- **Lack of Direct Access to Courts** - Th pictures and videos captured using 'e-Sakshya' are stored in the National Government Cloud (NGC) through 'Sakshya lockers'.
- The courts are yet to start directly accessing such pictures and videos through the ICJS.
- **Deplication of Work** - Many IOs make a copy through the CCTNS (which is linked to the NGC) and submit a pen drive or a similar electronic device in court, along with the final report of the case.
- **Inadequate Digital Infrastructures** - Some police stations have been given one tablet only, which is clearly not sufficient as each police station has more than one IO.
- **Use of Personal Phones** - IOs use their personal mobile phones to capture pictures and videos.
- 'e-Sakshya' can only be downloaded in mobile phones with Android version 10 and a minimum storage space of 1 GB.
- **Operational Challenges** - While each video could be of a duration of four minutes (maximum), there is no limit on the number of videos that can be taken.
- In case of a linked FIR, there is no provision to delete a picture or video that has not been recorded well.

### What lies ahead?

- Since all States and Union Territories are implementing the new laws, there is a need for feedback to review ease of implementation and carry out changes to minimise the practical problems that IOs face and also overcome the legal obstacles in courts.
- The MedLEaPR (Medico Legal Examination and Post Mortem Reports System), which is a web-based application developed by the NIC Haryana is under testing in Chhattisgarh.
- This will enable the health department to create and forward medical examination reports and post-mortem reports more quickly to the police through CCTNS.
- More resources need to be allocated for forensics and information and communication technologies.
- This will ensure that IOs do not have to use their personal gadgets for official processes and that each district has a separate mobile FSL unit.

To know more about, Bharatiya Nyaya Sanhita Act, [Click Here](#).

To know more about, Bharatiya Sakshya Adhinyam, [Click Here](#).

To know more about Bharatiya Nagarik Suraksha Sanhita, [Click Here](#).

## G.S PAPER I

### 2. GEOGRAPHY

#### 2.1 Marine Heat Wave (MHW)

##### Why in news?

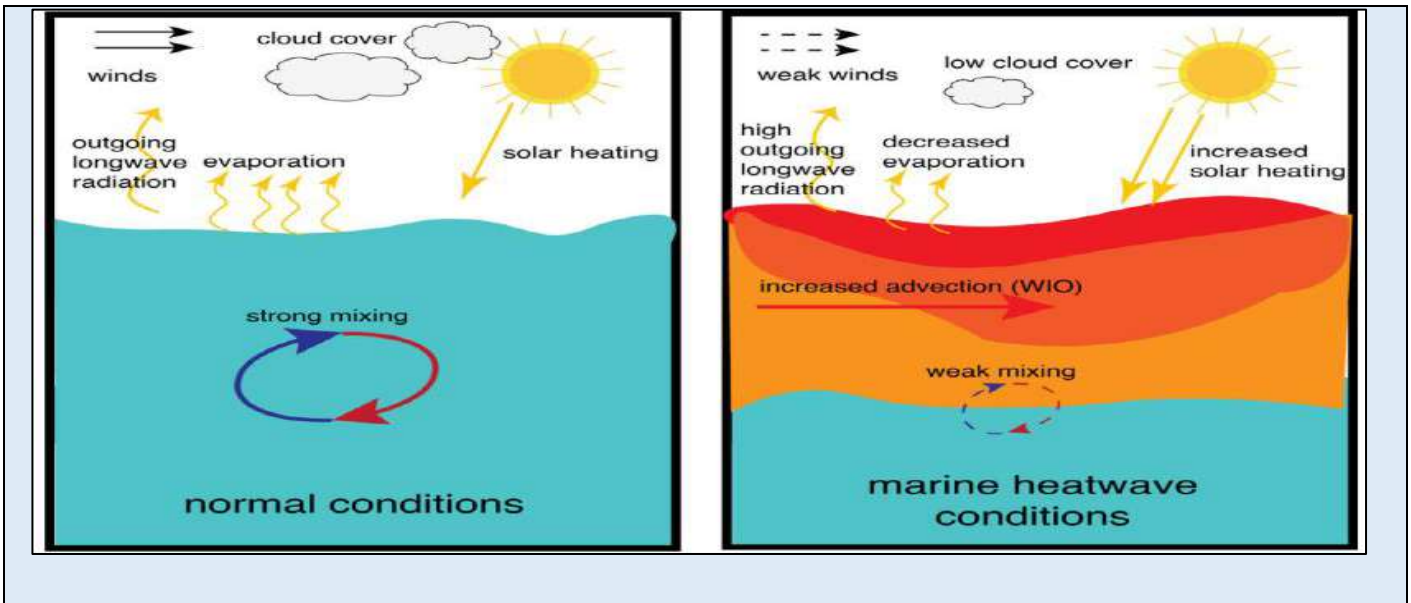
Recently, Mediterranean Sea has undergone an extremely intense marine heatwave, which scientists say could be a one-in-a-billion climatological event.

##### What is marine heat wave?

- **Definition** – As per IPCC 6<sup>th</sup> Assessment Report, marine heatwave are "a period during which **water temperature is abnormally warm** for the time of the year relative to historical temperatures, with that extreme warmth persisting for days to months.
- It is a condition, where the temperatures of the surface and sub-surface of a sea are much higher than the normal for extended periods of the time.
- They are defined based on differences in current temperature with expected temperatures for the location and time of year.
- **Occurrence** - It can occur during summer or winter.
- **Recent changes** - They have **tripled in frequency in the last 40 years** and last 50% longer.

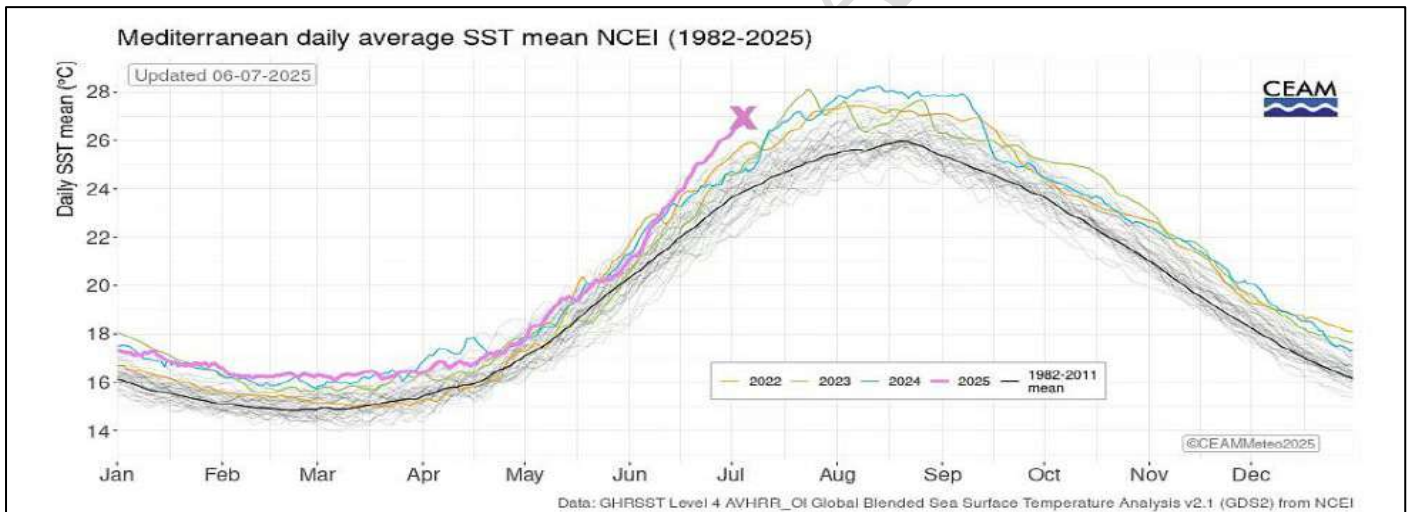
#### Causes of Marine Heat Wave

- **Global warming** - More frequent and intense heat waves are caused due to rise in atmospheric and ocean temperatures.
  - Rapid warming over last 2 years likely caused 240% increase in marine heatwaves globally.
- **Ocean Currents** - Local temperatures are influenced by Changes in ocean currents.
  - **For example**, if warm water is transported to a particular region, it can lead to increased sea surface temperatures.
- **Winds** - Winds can increase or decrease the warming that occurs during an MHW.
- **El Nino** - EL Nino typically leads to warmer ocean conditions, which can trigger MHWs.
- **Anthropogenic activities** - Human activities, such as coastal development, pollution, and overfishing, alter local ecosystems and contribute to temperature increases.
  - 87% of MHWs are attributable to human-induced warming.



### Why intense marine heatwave in Mediterranean?

- **Intense marine heatwave** – The month of July, 2025 marked the most extreme Mediterranean heatwave in relative to same month other years so far.
  - Peak anomalies +8°C now off France / Italy with absolute peak temps near 31°C.
- **Higher deviation in temperature** - Overall deviation of the sea surface temperatures (SST) in the Mediterranean is 6 standard deviations from the normal for this time of the year.

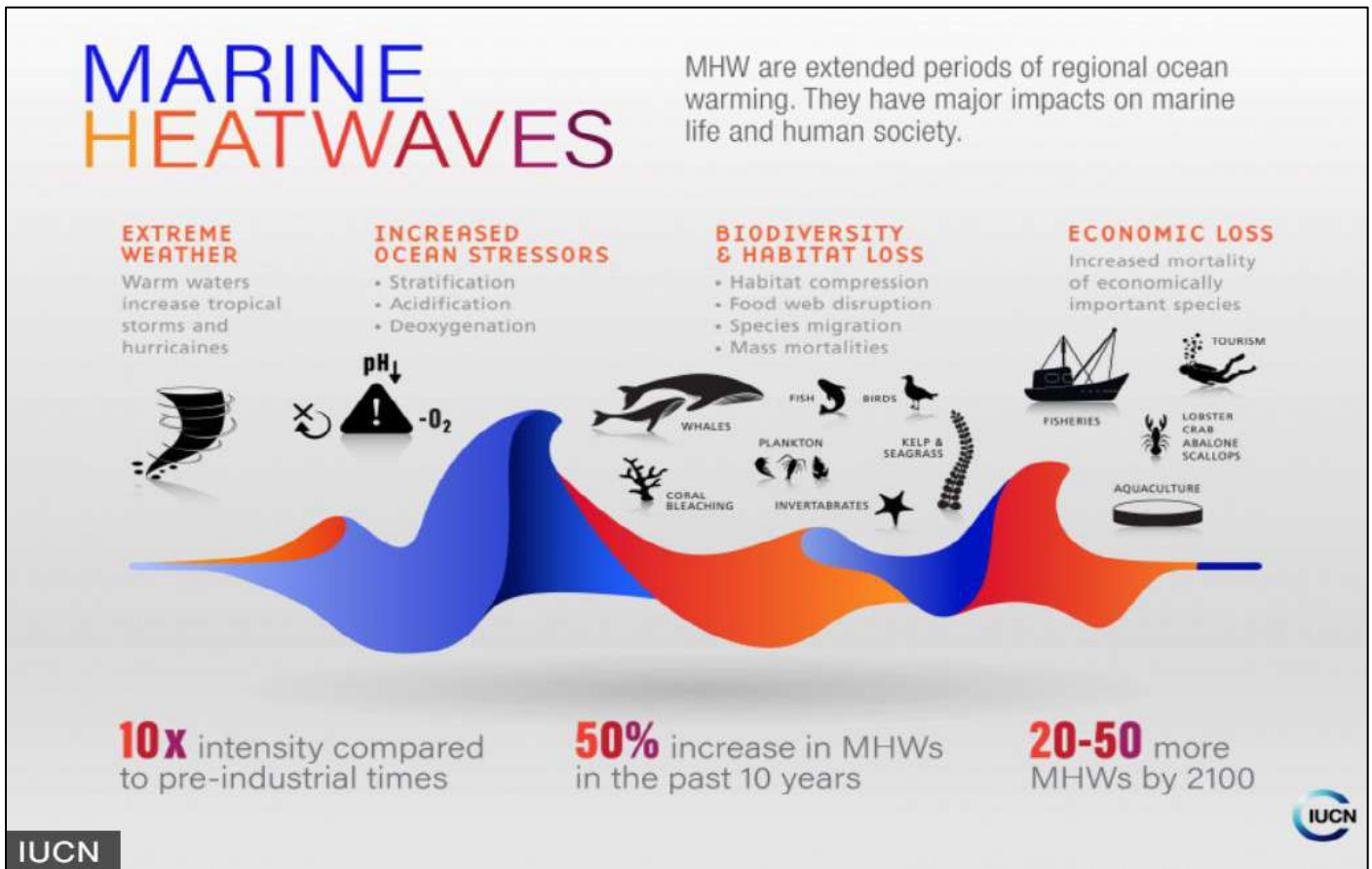


- **Causes** - The near surface temperatures in Europe have been higher than normal from the beginning of 2025.
- A heat dome that developed in June has increased the temperatures drastically over Mediterranean Sea, becoming more adverse in July.
- **Mediterranean heat dome** – It is a continuation of a large high-pressure ridge across the Atlantic basin.
- **Climate change** – It causes circulation changes, and some excess heat is also from reduced aerosols.
- **Immediate cause** – Lower wind activity and less mixing of water among the layers of the sea, mainly due to the formation of a heat dome.

**Heat Dome** is a large region of high pressure area in the atmosphere, the air sinks downward heating up the air. Unless an external weather system breaks the continuity of the dome, the extreme heat builds up within increasing temperatures, causing both atmospheric and marine heatwaves.

### What are its impacts?

- **Impacts** - In the western Mediterranean, the higher increases in temperatures were observed in Balearic Sea and the Tyrrhenian Sea.
  - **Worst-affected are parts** - Western Mediterranean Sea
  - **Severely impacted** - Central region of Mediterranean.



- **Affects livelihood of people** – It has the potential to kill or reduce the productivity of *economically important species* as farmed aquatic species can be susceptible to warm temperatures.
  - Fishing areas in the Spanish part of the Mediterranean show a steady temperature increase of 0.75 C per decade.
- **Mass mortality** - There were 5 consecutive mass mortality events, between 2015 and 2019, that included thousands of kilometres of coastline and a range of marine habitats
- **Loss of life and property** – It is due the torrential rainfall that can lead to flash floods and landslides.
- **Catastrophic rainfall** - Higher heat increase the moisture in the atmosphere, which could lead to more intense storms.
- Higher sea temperatures keep the air temperature dew points higher, resulting in more moisture for excessive and intense rainfall events.
- **Increased thunderstorms** - High moisture translates into higher temperature dew points, thus more convective energy to fuel thunderstorms.
- **Impacts tourism potential** - It can also *harm regional tourism* which serves as one of the important sources of income and livelihood of local communities.

*A dew point is the temperature to which ambient air needs to be cooled for it to be 100% saturated.*

### What lies ahead?

- Close monitoring of the extremely warm Sea during summer can be enhanced.
- Development of early warning and *forecast systems* could help in better prediction of risks and mitigation measures
- *Efforts can be increased to reduce fossil-fuel-based emissions* to limit the impacts of the Global warming and climate change.
- Strengthening the capacity and resilience of the local people can help in the protection of communities and ecosystems from MHWs.

## 3. SOCIAL ISSUES

### 3.1 Guidelines for obtaining OBC certificate

#### Why in news?

Recently, the Supreme Court had flagged the lack of guidelines on issuing Other Backward Class (OBC) certificates to the children of single mothers.

#### What is an OBC Certificate?

- **OBC certificate** – It is a certificate, which are issued to Backward Class communities which are listed by the Indian central Government as OBC (Other Backward Castes).
- **Issued by** – State government authorities, including the District Magistrate, Sub-Divisional Magistrate, and Tehsildar, among others.
- **Classification** – It is further classified into **creamy layer and non-creamy layer**.
- **Criteria for classification** – It is based on wealth, income limits, government employment criteria etc.

S.No	Creamy Layer	Non-creamy layer
1	Income- Above 8 lakh	Income- Below 8 lakh
2	Family income- Above 8 lakh ( agriculture income will not include)	Family income- Below 8 lakh ( agriculture income will not include)
3	In the case of any competitive exam, you are not eligible to take a relaxation	You enjoy the benefits including age relaxation and competitive exam
4	No requirement for any certificate	For reservation, you need to require to submit an OBC certificate

- **Applicability** – Only Non-creamy layer classified person will be eligible to get an OBC certificate.
- **Usage** - It can be used for scholarship in education and reservation in employment under government.

**Article 15** of Indian Constitution deals with 'Prohibition of discrimination on grounds of religion, race, caste, sex or place of birth'. **Article 16** deals with 'Equality of opportunity in matters of public employment'.

**Article 15 and article 16** of the Indian constitution deals with reservations in education and employment for people belongs to Scheduled Caste (SC), Scheduled Tribes (ST), Economically Weaker Sections (EWS), and Other Backward Castes.

To know about sub-categorization of OBC, [click here](#)

#### What are the existing guidelines for issuing OBC Certificate?

- **Existing provisions** – A child who is born from an inter-caste marriage typically inherits the caste of the father.
- A copy of an OBC certificate from the father or blood relatives on the paternal side should be attached to the application form for obtaining OBC Certificate for a child.
  - A woman who marries a man of a different caste cannot take on the caste of her husband.
- **Judicial basis** – In **Rameshbhai Dabhai Naika vs. State of Gujarat** case, the court examined the allocation of caste status of children born from inter-caste marriages, specifically between SC/ST/tribal and non-SC/ST partners.
- **Court Observation** – It held that, in an inter-caste marriage or a marriage between a tribal and a non-tribal, there may be a presumption that the child has the caste of the father.
- **Exception** – It also observed that, it is open to the child of such marriage to lead evidence to show that he/she was brought up by the mother who belonged to the SC/ST.
- If a couple separates or divorces, and the child is raised by a mother belonging to the SC or ST, the child may then assume her caste, if she is the sole caregiver.

### Rumy Chowdhury v. The Department of Revenue, Government of NCT Delhi (2019)

- **Judgement** – For children to inherit the mother’s caste, they have to produce *cogent evidence of being subjected to deprivation and disadvantages*.

### Smti. Moonsoon Barkakoti v. The State Of Assam (2024)

- **Judgment** – It reaffirmed that caste identity in inter-caste scenarios depends on *actual lived experience and community integration*, not just paternal lineage.

#### What is the current issue?

- **Petition** – It is a pleas by a *single mother holding an OBC certificate* seeking the issuance of an OBC certificate to her child based on her own status.
- It also requested amending the current guidelines, which give primacy to patrilineal lineage on caste certification.
- **Issue** – The case raises *questions on gender equality under Article 14*.
  - **Article 14** of Indian Constitution deals with ‘Equality before law’.
- **Support from Centre** – The central government had issued that, ‘any child born to an OBC parent, either divorced or separated, should be entitled to an OBC certificate based on either parent credentials under whom he is in custody or being raised’.
- **Ministry of Social Justice** – In its affidavit, it said that *OBC castes and its related subjects are matters of individual states* in the country and states need to roll out the mechanism for the same.
- It also informed that, to issue OBC certificate based on the mother's credential alone, it must be clear that the child has been living with and has been brought up by mother alone.
- **Supreme Court** – It made clear that a *uniform framework is needed* in this aspect and it *would lay down guidelines* on the matter, refusing to leave the issue entirely to the states.

### 3.2 Literacy Rate in India

#### Why in news?

Recently, Tripura attained the “full literacy” tag, citing data from Understanding Lifelong Learning for All in Society (ULLAS) – Nav Bharat Saksharta Karyakram.

#### What is known as literacy?

- **Literacy** – It was defined as “the *ability to read, write, and compute with comprehension*, i.e., to identify, understand, interpret and create, along with critical life skills such as digital literacy, financial literacy, etc.”
- **Literate** - According to the *Office of the Registrar General of India*, a person **aged 7 years and above** who can read and write with understanding in any language is considered literate.

#### What are the measures taken in India?

- **Right to Education (RTE) Act** – It was enacted in 2009, to mandate *free and compulsory education*, to establish minimum standards for schools, and to prohibit practices like discrimination and corporal punishment.
- **National Education Policy 2020** - It emphasizes foundational literacy and numeracy, promotes multilingualism, integrates vocational education, and fosters technology-enabled learning.
- It focuses on holistic development and *equips students with 21st-century skills*.
- **Samagra Shiksha Abhiyan** – It is a *comprehensive school education program* which combines three Centrally Sponsored Schemes (CSS)
  - Sarva Shiksha Abhiyan (SSA)
  - Rashtriya Madhyamik Shiksha Abhiyan (RMSA)

#### Status of Literacy Rate in India

- **Total literacy rate** - It accounts for 80.9% in the period 2023-24.
- **Top states**
  - Goa-99.72%, Mizoram -98.2%, Kerala - 96.2, Tripura - 95.6%.
- **Lowest states**
  - Andhra Pradesh- 72.6% and Bihar -74.3%.

○ Teacher Education (TE)

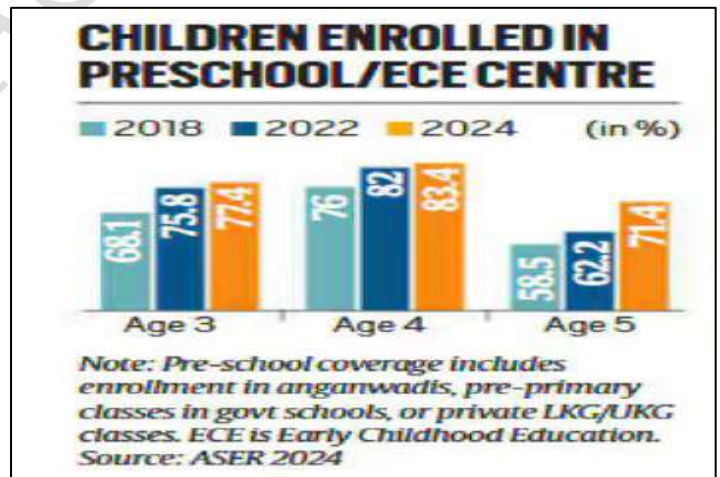
- **PM SHRI (PM Schools for Rising India)** - It intends to improve 14,500 schools to “showcase” the NEP, 2020, and be “exemplars” for other schools in their region.
- It is for existing elementary, secondary, and senior secondary schools run by the central government and state and local governments around the country.
- **DIKSHA (Digital Infrastructure for Knowledge Sharing)** – It aims provide digital content and resources to teachers and students.
- **Beti Bachao, Beti Padhao** - It aims to promote the education of the girl child and address gender disparities in education.
- **PM Vidyalaxmi Scheme** - It is a Central Sector scheme to provide financial support to students so that financial constraints do not prevent anyone from pursuing higher studies.
- It provides collateral free loans to students who are admitted in to quality higher education institutions (QHEIs).

### How effective are educational programs in India?

- **Increased literacy rate** - India’s literacy rate was only 14% at the time of independence, which has increased over the years as more people have received better education.
- **Increased reading level** - The number of Class 3 children who can read a Class 2 textbook in government schools stands at 23.4%, up from 16.3% in 2022 and 20.9% in 2018.
- **Improved arithmetic ability** - The arithmetic level improved across both government and private schools.
- **Rise in enrolments** - The % of children aged between 3 and 5 who enrolled in some form of pre-school rose in 2024 over 2018 and 2022.
- It is in line with the NEP’s focus on providing early childhood care and education to all children before Class 1.

### What are the key challenges in attaining high literacy?

- **Inclusion issues**- Disparities persist based on socio-economic status, gender, and caste.
- Various marginalized communities often have limited access to quality education.
- **Disparities in quality** - Disparities exist between urban and rural areas, private and public schools, and among states.
- **High dropout rates** -Despite efforts, dropout rates at various educational levels remain high due to factors like poverty, child labour and lack of infrastructure.
- **Quality issues** - Teacher shortages, uneven qualifications, and inadequate training hampers the full potential of the educational landscape of India.
- **Administrative Challenges** - Bureaucratic red tape slows down policy implementation, hindering the effectiveness of educational programs.



### What lies ahead?

- India should focus on restructuring the curriculum and pedagogy to bring innovative elements in the educational ecosystem.
- The education should be made more accessible, interactive, and tailored to the needs of diverse learners.

### Quick facts

#### ULLAS (Understanding Lifelong Learning for All in Society)

- It is a centrally sponsored scheme implemented from 2022-2027.
- It is also known as Nav Bharat Saaksharta Karyakram or New India Literacy Programme (NILP)

- **Objective** - It aims to *equip 5 crores 'non-literate individuals'* over the age of 15 across the country with foundational literacy and numeracy skills.
- The teaching material is also meant *to impart 'critical life skills'* like financial and digital literacy
- **Five components**
  - Foundational Literacy and Numeracy,
  - Critical Life Skills,
  - Basic Education,
  - Vocational Skills, and
  - Continuing Education.
- **Significance** – It aligns with the recommendations of the National Education Policy (NEP) 2020.

### Annual Status of Education Report (Rural)

- **Released by** - NGO Pratham
- **Survey** - It is a nationwide rural household survey
- **Objective** - To measure basic reading and arithmetic levels among school children, attendance in school, and other indicators.
- **Categories** - The survey considered children in three age categories
  - Pre-primary (ages 3 to 5)
  - Elementary (6 to 14)
  - Older children (15 to 16)

## WOMEN

### 3.3 Gender Stereotype

#### Why in news?

A recent research study at the Indian Institute of Technology Patna revealed that gender stereotypes continue to exert a significant influence on the career decisions of women in higher education institutions in Bihar and Jharkhand.

#### What is gender stereotype?

- **Definition** - According to the Office of the United Nations High Commissioner for Human Rights (OHCHR), a gender stereotype is a **generalized view or preconception about attributes or characteristics**, or the roles that are or ought to be possessed by, or performed by, women and men.
- It refers to the practice of ascribing to an individual woman or man specific attributes, characteristics, or roles by reason only of her or his membership in the social group of women or men.

Aspect	Stereotype	
	Boy	Girl
Early childhood	Play with Trucks	Play with dolls
Color Association	Pink	Black, blue, green
Familial role	Bread winner of the family	Doing household chores
Behaviour	Expected to act out	To be well behaved
Sports	Boys should engage	Girls may not do well

<b>Dressing</b>	Their own choice	Traditional and decent
<b>Leadership</b>	Natural leaders	Lack leadership qualities
<b>Jobs</b>	More dedicated and hard working	Less dedicated and less devoted to jobs
<b>Education</b>	Their own choice of any subjects	Not interested in STEM subjects
<b>Choice of children</b>	They may or may not consider for children	Women should have children soon after marriage
<b>Economic independency</b>	Men should have	Women cannot have as they will not respect their husband
<b>Emotions</b>	Men are emotionally strong	Women are emotionally weak

### What are the Causes for gender stereotypes?

- **Family Structures** - The traditional family model, has contributed to gender role expectations.
  - **Men** - Considered as the leader of the family.
  - **Women** - Responsible for domestic chores and caregiving.
- **Fear of being judged** - People often adhere to gender norms out of fear of being judged, ostracized, or discriminated against.
- **Patriarchal mindset** - Patriarchal societies often *value masculine attributes over feminine ones*, imbibing the notion that topmost jobs are suitable only for men.
- **Societal customs** - Many societies have ingrained traditional norms that have historical roots and have been reinforced over time, making them difficult to challenge.
- **Cultural beliefs** - Many religious and cultural practices promote specific gender roles and expectations.
- **Economic factors** - If one gender is systematically disadvantaged in terms of education, employment opportunities, and income, it can reinforce stereotypes about their capabilities and roles.
- **Influence of media** - The media, including television, movies, and advertisements, often *portrays biased and skewed depictions of gender roles.*

### What are the Issues of gender stereotyping?

- **Psychological Impact** – It negatively *impacts the mental health* of both men and women.
- This can manifest in the form of anxiety and depression, and at times can lead to such illnesses as anorexia and bulimia.
- **Limit's ability** – It is harmful when it limits women's capacity to develop their personal abilities, pursue their professional careers and make choices about their lives.
- **Self-esteem issues** - It can also cause someone to question their self-worth, as being different from societal expectations can make individuals feel that they are not as capable as others.
- **Erosion of trust** – It often results in *trust deficit in the society* which is already dwindling.
- **Exclusion issues** - Stereotyping women has a serious consequence of *leaving behind of women* in many spheres like education, employment etc.

### What are the steps taken by India?

- **Supreme Court handbook - *The Handbook on Gender Stereotypes*** is released by the Supreme Court of India.
- It is released with the intention of *assisting judges and legal practitioners* in recognizing, understanding, and combating gender stereotypes present in legal language and judgments.

Stereotype promoting language (INCORRECT)	Alternative language (PREFERRED)
Adulteress	Woman who has engaged in sexual relations outside of marriage
Affair	Relationship outside of marriage
Bastard	Non-marital child or, a child whose parents were not married
Biological sex / biological male / biological female	Sex assigned at birth
Born a girl / boy	Assigned female / male at birth
Career woman	Woman



#### What lies ahead?

- Breaking the stereotypes against women is important to promote inclusion and to build a more egalitarian society.
- Recognising and respecting the role and importance of women should be done in current fast-growing modern world.

### 3.4 Maternal Deaths in India

#### Why in the news?

Recent trends of *Maternal Mortality Ratio (MMR)* of India is on the decline, but there are States that need to focus on basic and systemic issues.

#### What is a maternal death?

- **Maternal death** – As per World Health Organization (WHO), Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy.
- It will be irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.
- **Maternal Mortality Ratio (MMR)** - Annual number of maternal deaths per 100,000 live births.

#### Status of MMR in India

- **Trends of Declining MMR** - India's MMR is decreasing i.e. 103 (2017-19), 97 (2018-20), 93 (2019-21) per 1,00,000 live births, despite disparities exist between states.
- **Regional status of MMR** – States classified into 3 categories.

- **“Empowered Action Group” (EAG)** - In the EAG States, Assam has a very high MMR (167), the rest of the data is Jharkhand (51), and Madhya Pradesh (175).
- Bihar, Chhattisgarh, Odisha, Rajasthan, Uttar Pradesh and Uttarakhand are in the 100-151 range.
- **Highest MMR** - Madhya Pradesh (175), Assam (167), Uttar Pradesh (151) among EAG States.
- **“Southern” States** – Andhra Pradesh (45), Telangana (46), Karnataka (63), Kerala (20) and Tamil Nadu (49).
- **Lowest MMR - Kerala (20) among Southern States.**
- **“Other” States - Cover the remaining States/Union Territories.**
- **Maharashtra is 38 and Gujarat 53; the rest of the data is Punjab 98, Haryana 106 and West Bengal 109.**

#### What are the medical causes of maternal deaths in India?

- **Bleeding after delivery** – It is a *leading cause*, when the placenta is separated after delivery and the raw opened surfaces of the uterine wall will bleed profusely unless it immediately contracts.
- **Obstructed labor** - If mother have Anaemia due to stunted growth/malnutrition, it will increase severity of labor pain.
- **Hypertensive disorders of pregnancy** - These are high blood pressure disorders that can result in a dire emergency with convulsions and coma.
- **Sepsis** – It is a condition that the *presence of micro-organisms in blood*, often due to home deliveries by untrained attendants.
- **Unsafe abortions** – It may be due to of failed contraception and crude abortion techniques.
- **Associated illnesses** – The diseases like malaria, urinary tract infections, tuberculosis, increases the chances of maternal death especially in EAG States.

#### What are the government initiatives?

- **Janani Suraksha Yojana** – It aims to reduce maternal and neonatal mortality by promoting *institutional delivery* among poor pregnant women.
- **Pradhan Mantri Matru Vandana Yojana (PMMVY)** – It provides *financial assistance to pregnant and lactating mothers*.
- **Beneficiary identified from disadvantaged backgrounds, to compensate for wage loss and improve health and nutrition.**
- **Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)** - Free *antenatal check-ups on the 9th of every month* at designated government health facilities.
- **Screening for high-risk pregnancies and counseling for safe motherhood.**
- **Accredited Social Health Activists (ASHA) and Auxiliary Nurse Midwives (ANM)** – They involve in promoting institutional deliveries and awareness.
- **Emergency transport services - 108 ambulance system** improving access to facilities, quickly connecting institutions without delay.
- **National Health Mission (NHM)** – It focus on reproductive, maternal, newborn, child, and adolescent health.

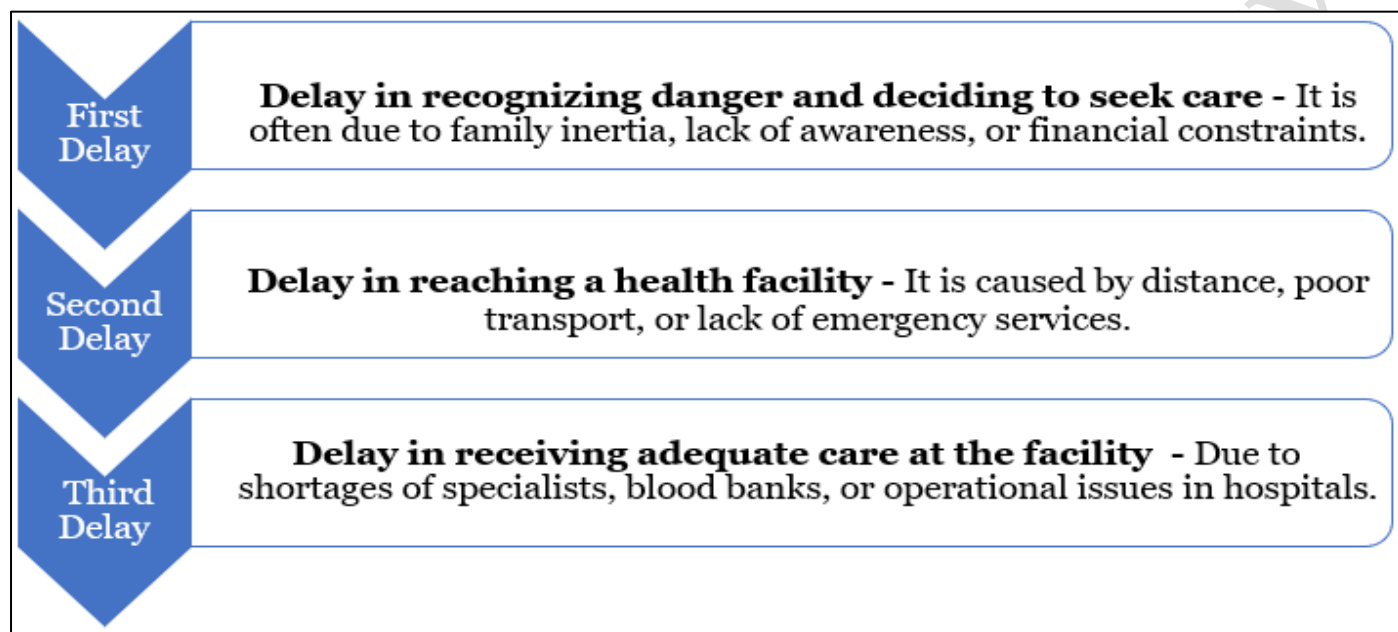
#### The Kerala model of a Confidential Review of Maternal deaths

- **Initiated by** - Dr. V.P. Paily
- The model has some analytical leads on how Kerala can further reduce its already low MMR of 20.
- **Features** - The use of uterine artery clamps on the lower segment, application of suction canula to overcome atonicity of the uterus
- **Sophisticated technology usage** - Energetic *management of amniotic fluid embolism* diffused intravascular coagulation, hepatic failure secondary to fatty liver cirrhosis are strategies taught to obstetricians.
- They even *address antenatal depression and post-partum psychosis* as there were a few cases of pregnant mothers ending their life.

### What are the challenges in reducing maternal mortality?

- **Regional disparities** - Some states lag, especially EAG States noting their connectivity to rural and remote areas.
- **Persisting systemic issues** - High vacancies of specialists, lack of blood banks, and inadequate emergency care facilities.
- **Socioeconomic barriers** - Poverty, low education, and poor nutrition among mothers.
- **Lack of quality care** - Need for improvement in emergency obstetric care and timely interventions.
- **The major “three delays”**

**SDG Target 3.1** deals maternal mortality and states that by 2030, to reduce the global maternal mortality ratio to less than 70 per 100 000 live births.



### What lies ahead?

- Tailoring interventions to state-specific needs can be done.
- Strengthening healthcare infrastructure is a key strategy in reducing maternal mortality in this way a multifaceted approach is needed.
- For example - First Referral Units (FRUs) with specialists and blood banks, institutions can provide timely quality care.
- Adopting best practices, for example, emulating Kerala’s model and advanced clinical management techniques can reduce MMR, it can help reaching sustainable.

## 3.5 Generational Gap in Women’s Health

### Why in news?

Recently, a study conducted by Plaksha University, Punjab revealed the prevalence of higher generational gaps in women health and hygiene.

### What is generational gap in health of women?

- **Generational gap in health** - It generally refers to disparities in health outcomes between different generations, often stemming from social, economic, and environmental factors.
- **Nutritional gap** – There is a problem of lifetime nutritional gap between each generation, which causes reproductive health problems.

### Healthier Girl Childhood

- According to National Family Health Survey-5 (NFHS-5), wealth is creating a healthier start for our girl children.

- **Better nutrition** – The malnutrition rates in girls (stunting, wasting, or being underweight), all decline significantly.
- **Access to sanitation** – There is a dramatic *increase in the access to better water, sanitation, and hygiene (WASH)* and modern period products.

### Health Issues in Adult Women

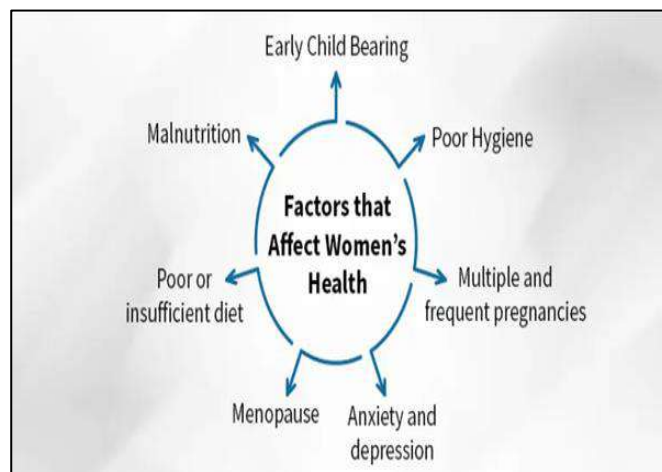
- Wealth is not translating into well-being for women over their entire life course.
- **Women health issues** - Women face unique health challenges throughout their lives, from puberty to pregnancy, menopause, and beyond.
- Women are twice as likely as men to die from heart attacks.
- Twice as likely to die of lung cancer, and women suffer more than men from Alzheimer's and autoimmune.
- The rates of complex health issues like those leading to hysterectomies (the surgical removal of the uterus) or difficult menopausal transitions show little to no improvement.

### Why there is generation gap on women health?

- **Lesser clinical trials on women** – It leads to lack of understanding on how disease manifest and how to treat women.
- **Socioeconomic factors** – Unequal pay, limited decision-making powers and *limited access to healthcare facilities*, disproportionately affect women, particularly those from marginalized communities.
- **Ignoring the health crisis** – While we measure the economic progress of a family, we miss the silent health crises unfolding across an entire generation of mothers,
- **Stigma around women's health** - Topics such as menstruation, menopause, and reproductive health are often considered taboo, making it difficult to address existing disparities.
- **Less focus on other disease** – There is more concentration on the reproductive health of women ignoring other health complexities.
- **Lack of capacity** – Our health system *lacks drastic surgical solution*, the capacity for nuanced, long-term care.

### What measures can be taken?

- **Strengthening existing programmes** – Strengthening the programmes like WASH can yield better health outcomes.
- **Investing in human resource** – ASHA and Anganwadi workers can be empowered with better training, resources, and fair pay.
- They can be encouraged to counsel a new mother on infant nutrition.
- **Developing multi-dimensional health system** – The chronic health issues require a robust public health system, high-quality preventative care, and trusted medical counsel for adult women.
- **Food fortification** – There can be mandatory food fortification of staples to ensure the next generation is healthiest.
- **Change in policies** - We need to measure what matters for a full life rate of chronic disease in adult women, access to menopause support, and the prevention of unnecessary procedures.
- **Changing the Definition of progress** – We can demand a *smarter definition of progress* which will help to understand the true meaning of progress covering holistic parameters.



### What lies ahead?

- A healthcare system that will support the women for their entire lives should be built where in future no generation of women is left behind.
- The generational gap in the health ecosystem should be bridged to ensure that women health is not neglected.

### 3.6 Challenges in Reducing Dowry Deaths

#### Why in the news?

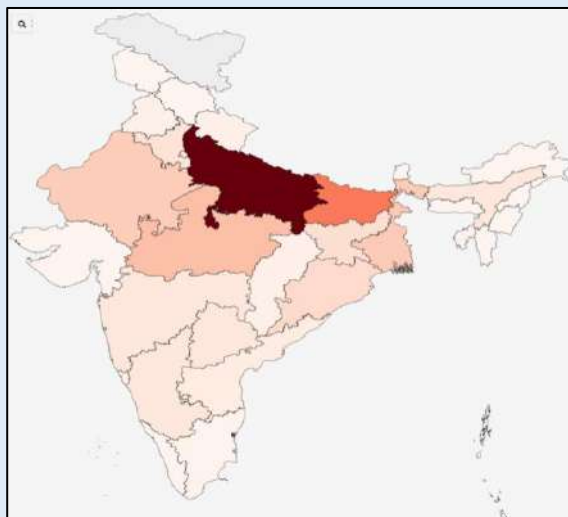
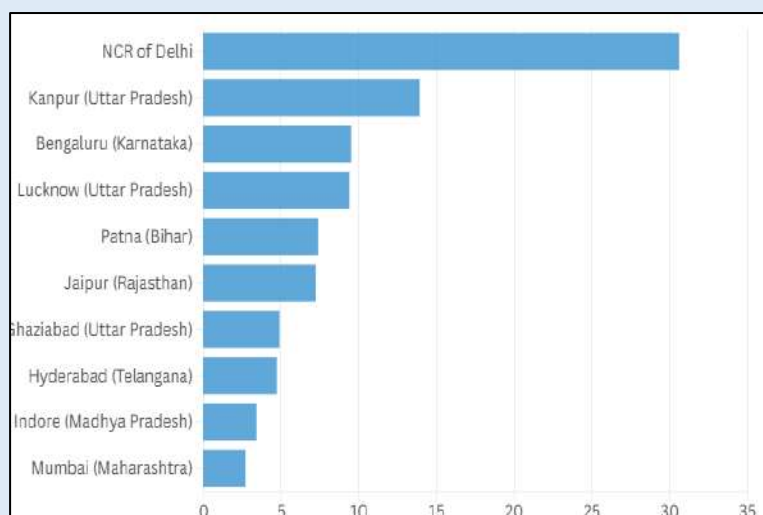
A series of dowry-related deaths in the recent times has put the spotlight back on the illegal practice of dowry.

#### What is dowry death?

- **Dowry** – Dowry Prohibition Act of 1961 defines it as ‘any kind of property or valuable security directly or indirectly agreed to be given by one party to another party to the marriage’.
- In simple terms, it refers to any kind of gift in the form of cash or goods including ornaments, which is given by the bride’s family to the bridegroom’s family.
- **Dowry death** – Section 80 of Bharatiya Nyaya Sanhita (BNS) defines dowry death as
  - Death of a woman, caused by burns, bodily injury, or unnatural circumstances, **within 7 years of her marriage** and
  - Where it is proven she was subjected to cruelty or harassment by her husband or his relatives in connection with dowry demands.
- **Causes** - When the groom or his relatives disagree with the dowry or seeking additional demands after marriage, the bride may face harassment, cruelty, or even violence.
- This abuse can escalate to the point where the woman either dies by suicide—commonly by hanging, poisoning, or burning—or is killed, most notoriously through "bride burning".
- Majority of the deaths occur within 7 years after the marriage.
- **Societal impact** – It constitute a grave violation of human rights, stripping women of dignity, security, and life.
  - **Gender discrimination** – It makes women vulnerable to abuse, exploitation, and even fatal violence.
  - **Patriarchal supremacy** – It reflects deeply entrenched patriarchal practices, reinforcing control over women within families and society.

#### Regional Distribution of Dowry Deaths in India

- Dowry was the main motive behind over 6,100 murders across India in the 2017-2022 period.
- **Vulnerable districts** – Over 60% of these murders were recorded in West Bengal, Odisha, and Bihar.
- Cases from these three States along with Jharkhand, and those in Uttar Pradesh, Madhya Pradesh, Rajasthan, Haryana and Rajasthan constituted 80% of all the dowry death cases filed in the 2017-2022 period.
- **Vulnerable cities** - Among the 19 cities in India for which data was available, 30% of all the dowry deaths cases were filed in Delhi in that period, the highest in India.
- Delhi was followed by Kanpur, Bengaluru, Lucknow, and Patna.



#### How it is regulated in India?

- **Dowry Prohibition Act of 1961** – Section 3 of the Act penalizes both the giving and taking of dowry.
- If dowry has been exchanged at a wedding anyway, it imposes a duty on the person who is given dowry to give it to the bride.
- **Bharatiya Nyaya Sanhita (BNS)** - Sections 85 and 86 *criminalize such acts by the husband or his relatives* that drives a woman to suicide or causes grave injury, including harassment related to dowry demands.
- The prescribed punishment under BNS remains a *minimum of 7 years' imprisonment*, extendable to *life imprisonment*.
- **Bharatiya Nagarik Suraksha Adhiniyam** – It will govern the *procedural aspects of investigating and prosecuting offenses* under the Dowry Prohibition Act and the related provisions in the BNS.
- It will dictate the processes for registration of cases, investigation, arrest, bail, and trial related to these crimes.

**Bharatiya Nyaya Sanhita**  
replaced Indian Penal Code while  
Bharatiya Nagarik Suraksha Adhiniyam  
replaced the Code of Criminal Procedure.

### What are the challenges in reducing dowry deaths?

- **Unreported cases** – According to the National Crime Records Bureau, an *average of only 7000 cases* of dowry deaths was reported every year in the period of 2017-2022 while many were unreported.
- **Lesser chargesheets** – Of the 7000 reported dowry deaths reported, only around 4,500 were charge-sheeted by the police.
- The rest were either stuck at various stages of investigation or disposed off for various reasons.
  - **For instances**, 'case true but insufficient evidence', 'false case', and 'complaint was based on a misunderstanding or incorrect information.'
- **Delayed investigations** – Some cases were stuck in the investigation stage for *more than 6 months*.
  - Of the nearly 3,000 dowry death cases pending investigation at the end of 2022, 67% were stuck in that stage for over 6 months.
- **Delays in filing charge sheets** – Many chargesheets were filed following investigations that lasted for over two months.
- **Judicial pendency and lesser conviction rate** – Only few cases reach the court and results in convictions while other cases got stuck in court procedures or were disposed off by the courts.
  - **For instance**, the case may be withdrawn, or compromised, or ended in a plea bargain.
- In some cases, the accused were *acquitted due to lack of evidence*.
  - Of the average of 6,500 cases sent for trial every year, only around 100 resulted in convictions.
  - Over 90% of the rest remained pending in court at various stages.

### What are the measures can be taken?

- Gender-sensitization can be encouraged to promote dowry-free marriages and community vigilance.
- Awareness campaign can be conducted to encourage victims to report any case of dowry harassments and dowry related deaths.
- Fast track courts can be set-up to ensure stricter enforcement of anti-dowry laws.
- Investigations can be expedited to ensure timely and accurate prosecution.

### Quick Facts

#### National Crime Records Bureau (NCRB)

- **Establishment** - Formed *in 1986 under the Ministry of Home Affairs*, headquartered in New Delhi.
- **Role** - Act as a central agency for crime data collection, analysis, and dissemination to aid policy and investigation.
- **Publications** - Publishes the annual "*Crime in India*" report and other specialized crime reports.
- **Key functions** - Maintains criminal databases like
  - Crime and Criminal Tracking Network and Systems (CCTNS)

- National Automated Fingerprint Identification System (NAFIS)

## G. S. PAPER II

### 4. INDIAN POLITY

#### 4.1 Dynamics of Democracies in India and US

##### Why in the news?

On July 4, the United States observed its Independence Day which is one of the largest democracies of the world.

##### What is democracy?

- **Democracy** – it is a form of government in which the rulers are elected by the people.
- Abraham Lincoln, 16th US president, defined it as "Democracy is a government of the people, by the people and for the people".
- **Types of democracy** – Two types direct and indirect.

Direct democracy	Indirect democracy
People will participate in decision making of the government on daily basis.	Also called as Representative democracy, where leaders elected by people will make decisions.
<b>Examples</b> – US provinces, Switzerland.	<b>Examples</b> – India, France, Canada.

- **Features** – Democratic government rules within limits set by constitutional law and citizens' rights.
- **Free and Fair Election** - It must be based on a free and fair election where those currently in power have a fair chance of losing.
- **Universal Adult Franchise** - Each adult citizen must have one vote and each vote must have one value.
- **Advantages** - A democratic government is a better government because it is a more accountable form of government.
- Democracy provides a method to deal with differences and conflicts.
- It improves the quality of decision-making, enhances the dignity of citizens.

##### How did India's democracy backslide during 1975 emergency?

- **Legal Suppression of Democracy** – The imposition of emergency did not violate the constitution, but was imposed legally.
- Emergency suspended civil liberties, censored the press, imprisoned over 1, 00,000 citizens, and reduced Parliament and the courts to shadows of themselves.
- **Suppression of Civil Liberties** – Persons who expressed dissent were portrayed as anti-national, and subject to treason charges.

*Article 352 of constitution deals with proclamation of emergency. President declare that the security of India or any part of the territory thereof is threatened by war or by external aggression or by armed rebellion.*

*On 25 June 1975, the then President Shri Fakhruddin Ali Ahmed issued the **Emergency proclamation** under Article 352, citing threats from internal disturbance.*

- **Suspension of Right to Life** - The Supreme Court ruled that during the Emergency, even the right to life could be suspended.
- Only one judge, Justice H.R. Khanna, dissented against government in emergency for which he was never appointed Chief Justice, punishment for his integrity.
- **Rights Became Privileges** – Rights became government permitted rather constitutionally provided.
- **Preventive Detention** - People questioning the government were detained under the Maintenance of Internal Security Act (MISA), a preventive detention act without trial.

- As of 1 January 1975, Indian jails housed 2,20,146 prisoners against a capacity of 1,83,369.
- Among them, 1,26,772 were under-trial prisoners.
- **Sterilisation Drive** - Over 1.07 crore sterilisations were conducted nationwide during the Emergency.
- These included 548 complaints involving unmarried individuals and 1,774 reported deaths linked to the procedures.
- **Censorship of Press** - From 26 June 1975, pre-censorship was imposed on all newspapers and Editors were required to get government clearance before publishing news, editorials, and photographs.
- The government appointed a national censor along with regional censors to monitor press content.
- **Media Classification** - Newspapers were labelled as 'friendly', 'neutral' or 'hostile' based on their editorial stance and coverage.
- **Compromise of Institutional Integrity** - Judges, Ministers, civil servants, even journalists, People entrusted with guarding democracy *chose loyalty over law* to serve prime ministers interests.

*After the Emergency ended in March 1977, the government appointed **Shah Commission of Inquiry** to examine its impact and the actions taken during the period.*

### How are the dynamics of US similar to India?

- **Undeclared Emergency** – Though emergency in is not declared in the US, the political conditions are similar to India in 1975.
- **Weakening of Institutions** - Institutions such as Congress, Supreme Court, Media that are meant to act as a check on the President's power has become weak and are dominated by the executive influence.
- **Executive Dominance Over Parliament** – The president has a majority in both Houses of Congress, so the laws ruled by him will be passed even while opposition refuse.
- **Judicial Weakness** – The President has 6-3 conservative majority in the Supreme Court, which legalizes all his actions.
- **Passive Press**– Media refrain from actively questioning the government out of fear or pressure.
- **Legal Intimidation** - President can weaponize the Justice Department to prosecute his opponents, threaten to strip immigrants of their citizenship and residency status.
- If law enforcement serves power instead of the public, then the law ceases to be king and we begin the slow coronation of another.

### What lies ahead?

- Though the emergency in India was ended in 1977, the deeper damage to political culture, to institutions, to the constitutionalism still remains.
- Today, both India and America are democracies by form, their futures depend on how citizens, official's act when faced with leaders who believe they are above the law.
- Constitution is not fixed, it must be redefended, reinterpreted, and reaffirmed by each generation.
- The normalization of revenge politics, the erosion of checks and balances needs to be resisted.

***H.V. Kamath** (constituent assembly member) warned, **Constitutions do not protect liberty on their own. They must be guarded by people with the courage to say no.***

## 4.2 Secularism

### Why in the news?

*Secularism is seen frequently in news due to debates over its interpretations and implementation of Universal civil code (UCC).*

### What is secularism?

- **Secularism** - It is the principle where the *state remain distant, maintains neutrality towards all religions*, ensuring no official state religion and equal treatment of all citizens regardless of faith.
- **Origin** - The word secular is derived from the **Latin term saeculum**, meaning "a generation," "a human lifetime," "an era of time," or "a century."
- **Usage** – Initially, it is used to denote *worldly or temporal matters*, as opposed to religious or spiritual ones.
- In the middle ages, it was used by Christians to refer to matters not related to the church or religious life.

- The term in its modern sense was coined by the British writer George Jacob Holyoake in 1851.
  - Secularism seen as a product of modernity and rational thought.
- **Importance** - It guarantees *freedom of religion, non-discrimination*, and separation of religious institutions from state affairs.

### John Locke

- State exists for civil interests, not spiritual salvation.

### Roger Williams

- He advocated separation to protect religion from state interference.

#### What are the various models of secularism practiced?

- **England** - Anglican Church is official, but equal rights and religious freedom are protected.
- **Ireland** - Preamble references Christianity, but state cannot favor or discriminate based on religion.
- **Greece** - Orthodox Church is dominant, but equality and freedom of religion are constitutionally guaranteed.
- **Pakistan** - Islam is state religion, minorities have rights to practice and cultural development, with provisions for representation.
- **Sri Lanka** – Buddhism given foremost place, but freedom to adopt any religion is protected, and minorities follow personal laws.
- **India** – It emphasizes on *no official state religion*, equal respect for all faiths, reflecting the country's diverse and multi-religious context.

Indian model	Western model
<ul style="list-style-type: none"> <li>• It embodies <i>positive concept</i> advocates for positive intervention into religious affairs.</li> </ul>	<ul style="list-style-type: none"> <li>• It embodies <i>negative concept</i>, by strict separation from the religion.</li> <li>• For example, <i>US and France</i>.</li> </ul>
<ul style="list-style-type: none"> <li>• It is a <i>model of "principled distance,"</i> where the state may engage with or intervene in religious matters.</li> <li>• It is to ensure equality, reform, and protection of minority rights.</li> </ul>	<ul style="list-style-type: none"> <li>• It is a <i>strict separation between religion and state</i>, often excluding religion from public affairs.</li> </ul>

#### How the concept of secularism evolved in India?

- **Historical roots** - *Ashoka's influence over religion* promoted religious tolerance & coexistence.
  - **Rock Edict 7** - All religions should reside everywhere, promoting self-control and purity of heart.
  - **Rock Edict 12** - Prohibited glorification of one's religion and condemnation of others.
- **Freedom struggle** - Secularism was a guiding principle during India's independence movement.
  - **1928 Motilal Nehru Committee** – It proposed no state religion, no preference or disability based on religion.
  - **1931 Karachi Resolution** – It emphasised state neutrality in religious matters.
  - **1944 Hindu Mahasabha Draft** – It explicitly declared no state religion.
- **Supreme Court** – In the *Kesavananda Bharati case (1973)*, it had held that *secularism is a basic structure* of Indian Constitution.
- **Constitutional amendment** – The word *secular* was *added through 42<sup>nd</sup> constitutional amendment act in 1976*.

*In 1976, the then Indian Prime Minister Indira Gandhi justified the inclusion of the word 'secular' that it would reinforce India's commitment to social justice & religious equality.*

### What are the contemporary challenges?

- **Political misuse** - Rise in communal politics and attempts to reinterpret secularism for political gain.
- **Hate speech** – It increase in religious intolerance and hate speech against minorities.
- **Misconceptions** - Some people believe that secularism grants special privileges to minorities.
  - In reality, it prevents state domination over religion and promotes autonomy for all.
- **Dissent over its inclusion in Constitution** - There are ongoing discussions on the inclusion of 'secular' in the Preamble.
  - Organization like RSS calls for review of secularism provisions.

*Theocratic state is relating to or denoting a system of government in which priests rule in the name of God or a god. In theocratic states, there is excessive state control over religion, which undermines religious autonomy.*

### What lies ahead?

- **Reaffirming neutrality** - State may remain neutral and not endorse any religion to ensure safeguard of all religions.
- **Promoting tolerance** - Emphasizing coexistence and respect for all faiths, as rooted in Ashokan and constitutional ideals can be helpful to maintain harmony over various religions.
- **Positive secularism** – The state may encourage a model that respects all religions without state interference or favoritism.

## 4.3 Universal Adult Suffrage

### Why in the news?

Recently, the Supreme court's remark on 'right to vote' has cast a spotlight on the foundational processes of India's electoral machinery and the genesis of India's 'universal adult suffrage' (UAS).

### What is universal adult suffrage?

- **Universal adult suffrage** – It refers to the **right of all adult citizens to vote**, regardless of their social status, wealth, education, or other factors.
- It is also called as *Universal Adult Franchise*.
- **Importance** – It is a cornerstone of democracy, ensuring that *all citizens have a voice in choosing their representatives*.
- **Adoption in India** – It is adopted at the time of adoption of the present-day constitution i.e. *January 26, 1950*.
- **Constitutional provision** - **Article 326** of the Constitution provides that the elections to the House of the People and to the Legislative Assembly of every State shall be on the basis of adult suffrage.
- **Electoral roll** – The **names of eligible electors** ordinarily residing in an assembly constituency, are enlisted in the voters list by the registering authority.
- The Election Commission is empowered under Section 21 of the Representation of peoples Act 1950 to prepare and revise electoral rolls to ensure integrity.

*Free and fair elections is part of the basic structure of our Constitution as declared by the Supreme Court in various cases and in this regard, the right to vote is granted to all citizens who are 18 years of age or older.*

*The voting age for elections to the Lok Sabha and State Legislative Assemblies was lowered from 21 to 18 years old by the 61st Amendment Act of 1988.*

### What is legality of right to vote in India?

- During Constitutional Debates, B.R. Ambedkar and K.T. Shah proposed adding 'right to vote' in the fundamental rights part but the Constituent Assembly's Advisory Committee rejected the idea.
- **Statutory right** – It is recognized as a statutory right under Section 62 of the *Representation of the People Act (RPA), 1951*.
- **Supreme Court's clarification** - In *Kuldip Nayar v. Union of India (2006)*, it had clarified that voting is **not a fundamental or constitutional right**.
- In the case of *Anoop Baranwal v. Union of India (2023)*, it reiterated the same as given in Kuldip Nayar case judgment.

- **Democratic imperative** - Despite its statutory nature, courts recognize voting as essential for democracy's survival and enables citizens shape governance.

### Who can become a voter?

- Every Citizen who is 18 years old on the qualifying date (1st January of the concerned year, unless disqualified is eligible to be enrolled)
- Enrollment only at ordinary place of residence.
- Enrollment only at one place.
- Overseas Indian deemed to be ordinarily resident at address given in passport.
- Service Voters deemed to be ordinarily resident at their home address.

### What are the challenges in voter inclusion?

- **Inclusion barriers** - Illiteracy, lack of awareness, and administrative hurdles can exclude eligible voters.
- **Inaccurate electoral rolls** - It includes omissions, duplicates, ineligible names that threatens the "one person, one vote" principle.
- **Systemic errors** - It refer to consistent, repeatable problems that distort the outcome or fairness of the electoral process.
  - **For example** - Election Administration Bias, Biased Voting Technology, Voter Suppression, Gerrymandering etc.
- **Voter suppression** - Practices that disproportionately prevent certain groups (e.g., minorities, the elderly, and students) from voting.
  - **For instance**, strict ID laws, purging voter rolls, or limited polling locations.
- **Citizenship verification** - Controversies over verifying citizenship risk wrongful disenfranchisement without due process.
  - **For instance**, Special Intensive Revision (SIR) of electoral rolls in Bihar.

*The Election Commission used election symbols and other innovations to empower millions of illiterate voters. Nearly 173 million largely illiterate voters enrolled in electoral rolls because of EC's efforts.*

***Gerrymandering** means manipulating district boundaries to favor a particular political party or group, skewing representation.*

### What reforms can be taken?

- **Electoral roll updating** - Continuous updating and purification of electoral rolls to remove ineligible names and include eligible voters.
- **Electronic integration of death registration data** - It will enable Electoral Registration Officers (EROs) to immediately delete the names of deceased persons from the electoral roll.
  - At the same time, Booth Level Officers (BLOs) will be sent out for field verification to confirm the validity of the information.
- **Standardized photo identity cards for BLOs** - Official ID cards will assist in establishing the legitimacy and authority of BLOs while conducting their door-to-door interactions with people.
- **Redesigned Voter Information Slips (VIS)** - This new slip with clear numbers and fonts especially helpful to senior citizens, persons with disabilities, and first-time voters, and simplifies voting procedure.
- **Authenticating EPIC** - Linking citizens' Aadhaar number with EPIC (Electors Photo Identity Card) may be considered to accurately identify the voters with privacy measures.
- **Document expansion** - Accepting more identity documents for voter registration, as suggested by the Supreme Court.

### What lies ahead?

- Political parties can actively help include eligible voters and remove ineligible ones.
- Due process and natural justice in citizenship verification and voter deletion cases can be ensured.
- Voter education can be promoted, so that citizens verify and update their entries, becoming custodians of electoral integrity.

#### 4.4 Delisting of Political Parties

##### Why in the News?

*The Election Commission of India (ECI) has initiated steps to de-list 345 Registered Unrecognised Political Parties (RUPPs).*

##### What are registered parties?

- **Registered Unrecognised Political Parties** – These are political entities registered under Section 29A of the Representation of the People Act, 1951, but have not yet qualified for recognition as either State or National parties.
- **Representation of the People Act, 1951 (RP Act)** – It lays down the requirements for registration of a political party with the ECI.
- **Registration Process** - Any political party that seeks registration should submit a copy of its memorandum/constitution within 30 days of its formation.
- **Oath** - The party shall bear true faith and allegiance to the Constitution of India and its' principles of socialism, secularism and democracy, and uphold the sovereignty, unity and integrity of India.
- **ECI Verification** - The ECI reviews the memorandum/constitution of the political party to verify that it contains provisions for internal democracy like periodic elections for its office bearers.
- The ECI thereafter registers them as Registered Unrecognised Political Parties (RUPP).
- **Benefits for RUPP** - Tax exemption for donations received under Section 13A of the Income Tax Act, 1961.
- A common symbol for contesting general elections to the Lok Sabha/State Assemblies and 20 'star campaigners' during election campaigns.
- **Donation Conditions** - The RUPPs under the Income Tax Act, 1961, are further required to accept donations in excess of ₹2000 only through cheque or bank transfers.
- RUPPs are required to maintain the details of individual donors who have donated above ₹20,000 in a financial year and submit these details to the ECI every year.
- Failure to furnish these details will result in losing income tax exemption.

*The right to form an association is a fundamental right guaranteed under Article 19(1)(c) of the Constitution to all citizens.*

##### What are the issues with inactive RUPPs?

- **Letter Pad Parties** - As per ECI notification, there are more than 2,800 RUPPs in India as of May 2025 and Only around 750 of them contested the 2024 general elections.
- **Tax Evasion** – These inactive RUPPs misuse the income tax exemptions for tax evasion and money laundering
- **Financial Fraud** - Some inactive RUPPs are suspected of operating as shell companies or vehicles for illicit financial transactions.
- Investigations have revealed instances where large sums of money are routed through these parties, often without proper accounting or transparency.
- **Disrupting the Electoral Process** - There have been cases where RUPPs field dummy candidates in elections, only to demand money from recognized parties to withdraw their nominations.
- **Resource Misallocation** - Resources that could be utilized for genuine electoral reforms and voter education might be diverted to deal with the issues arising from inactive parties.

##### How RUPP's are delisted?

- **Lack of De-register Power for ECI** - The RP Act does not confer explicit powers on the ECI to de-register any political party if it fails to contest elections, conduct inner-party elections or lodge requisite returns.
- The Supreme Court in *Indian National Congress versus Institute of Social Welfare & Ors (2002)* had held that the ECI does not have the power to de-register any political party under the RP Act.

- **De-register under Exceptional Circumstances** - ECI may de-register RUPP only under exceptional circumstances such as
  - Registration being obtained by fraud
  - The political party ceasing to have allegiance to the Indian Constitution
  - If it is declared unlawful by the Government
  - If they were found to be 'non-existent' at their address even after notices from the ECI
- **Publication of De-lists** - The ECI from time to time publishes the list of de-listed and inactive RUPPs.
- **Inactive Parties** - Political parties that have not updated the material changes including the list of office bearers since 2014 have been classified as 'inactive'.
- **Impact of Delisting** - These parties are denied the benefit of putting up candidates with a common symbol in an election and made ineligible for tax exemptions.

*The notification of March 2024 (as amended till May 2025), contains the list of 281 de-listed and 217 inactive RUPPs.*

#### What are the challenges for ECI in managing political parties?

- **Inadequate Authority** – ECI lacks adequate power to issue directions to political parties and de-registering them for violations.
- **Non-compliance with Financial Disclosures** - Many RUPPs fail to file mandatory financial disclosures, such as contribution reports and annual audit accounts, making it difficult to track their funding sources and expenditure.
- **Difficulty in Monitoring** - It is challenging for ECI to effectively monitor thousands of RUPPs, especially when many don't have traceable offices or active operations.
- **Ensuring Accountability** - With a large number of inactive parties, it becomes challenging for the ECI to monitor and ensure accountability, leading to a less transparent political landscape.
- **Record Management** - Managing and maintaining records for a massive number of RUPPs, many of which are inactive, creates an unnecessary administrative burden on the ECI.
- **Overburdening of ECI** - Managing and maintaining records for a massive number of RUPPs, many of which are inactive, creates an unnecessary administrative burden on the ECI.

#### What lies ahead?

- The Law Commission in its 255th report (2015) had recommended amendments for de-registration of a political party if it fails to contest elections for 10 consecutive years.
- The ECI in its memorandum for electoral reforms (2016) had also suggested amendment to the RP Act that would empower it to de-register a party.
- As suggested by the Law Commission in its 170th and 255th report, the RP Act can be suitably amended to contain specific provisions for ensuring internal democracy in political parties.
- Political Parties Registration Tracking Management System (PPRTMS) can be promoted for greater transparency.

## 4.5 Right to Privacy of Adolescents

### Why in the news?

Recently, the Supreme Court delivered a landmark verdict in *Right to Privacy of Adolescents*, refusing to sentence a man convicted under the POCSO Act after considering the victim's wishes and socio-economic background.

### What is the POCSO act?

- **POCSO** - The Protection of Children from Sexual Offences (POCSO) Act was passed *in 2012 to protect children under 18 years* from sexual abuse and exploitation.
  - **Child** – All persons below 18 years treated as child.
  - **Adult** – All persons who attain age of 18.
- **Purpose** - It *criminalizes all sexual activity with minors*, including consensual acts, without consideration for the adolescent's agency or context.

- **Provisions** - Crimes like penetrative assault (Sec 4/6), rape (Sec 376 IPC), and kidnapping (Sec 361 IPC) are read together in such cases, mandating stringent sentencing.
- **Section 6** – It deals with Punishment for aggravated penetrative sexual assault.
- It says that is whoever commits aggravated penetrative sexual assault shall be punished with rigorous imprisonment for not less than 20 years, but which may extend to imprisonment for life
- **Inclusion of adolescent as a Child** – It does not recognize consensual sexual activity among or with adolescents aged 16 to 18 years and such acts are criminalized under the Act.

World Health Organization (WHO) defines **adolescence** as **10–19 years**.

To know more about POCSO, click [here](#)

### What is the issue?

- **Case** – It involved a 14-year-old girl from rural West Bengal who left her home to be with a 25-year-old man, who later got married and had a child in 2021, when she was 17.
- The man was arrested subsequently and tried for kidnapping, rape, aggravated penetrative sexual assault, and child marriage.
- **POCSO Special Court** – It sentenced the accused to 20 years imprisonment.
- **High Court** – It noted the socio-economic background of the couple who did not understand that their relationship constituted an offence.
- Taking a “humane view of the matter to do complete justice” the High Court reversed the lower court’s conviction.
- **Issues** – The High Court noted that “the approach adopted under the POCSO Act renders adolescents vulnerable to criminal prosecutions for normative sexual behavior.
- The court also made problematic comments that female adolescents should “control sexual urge/urges” that created an outrage in media which mad the Supreme Court took up the matter suo moto.

### What are the key judgements by the Supreme Court?

- **Initial verdict** - It restored the accused’s conviction and rejected the concepts of “non-exploitative” sexual acts with a minor aged 14 years, and the category of “older adolescents”.
- **Ordered to form an enquiry committee** - It directed the state to appoint an expert committee to ascertain whether the “victim” – now an adult – wanted to continue living with the accused or preferred to accept benefits offered by the State Government.
- The committee was to comprise a clinical psychologist, a social scientist, and a child welfare officer.
- **Observation** - The committee’s report and the Court’s interaction with the woman revealed the heavy emotional & financial toll that the legal battle had had on the family and the “collective failure of the systems” in protecting her.
- **Final verdict** - It concluded that in this case, “true justice lies in not sentencing the accused to undergo imprisonment”, adding that “if we send the accused to jail, the worst sufferer will be the victim herself.”
- It exercised its extraordinary jurisdiction, under Article 142 of the Constitution, and did not impose any sentence on a young man convicted of aggravated penetrative sexual assault under Section 6, Protection of Children from Sexual Offences (POCSO) Act.

**Article 142** of the Indian Constitution deals with enforcement of decrees and orders of Supreme Court and orders as to discovery, etc. It deals with the powers of Supreme Court in ensuring complete justice.

### What are the challenges with the case and its judgments?

- **Non alignment with human rights law** – Both the concept of non-exploitative sexual acts and the concept of older adolescents are recognized under international human rights law.
- General Comment No. 20 by the Committee on the Rights of the Child under the UNCRC, exhorts States to “avoid criminalizing adolescents of similar ages for factually consensual and non-exploitative sexual activity”.

**The UN Convention on the Rights of the Child (UNCRC)** is an important, legally binding agreement signed by 196 countries (as of 12 July 2022) which outlines the fundamental rights of every child, regardless of their race, religion or abilities. India ratified it in 1992.

- **Refraining from normalizing the verdict** - Both the High Court & Supreme Court *barred their cases from being treated as precedent*, with the top court describing this as an “extraordinary” case.
- The judicial reluctance reveals the *limitations of case-by-case exceptions* and the urgent need for structural reform.
- However, empirical studies suggest that adolescent relationships, especially above 16 years, is not extraordinary but a common reality.

### Increasing Consensual Adolescent Relationships

- An Enfold study showed that out of 7,064 POCSO judgments in Assam, Maharashtra and West Bengal between 2016 to 2020, 24.3% involved romantic relationships, with *82% of victims in such cases refusing to testify against the accused*.
- Another study by Enfold and P39A on judicial trends in 264 cases under Section 6, POCSO Act from these States found that *25.4% involved consensual relationships*.

- **Non consideration of scientific reasons** - scientific studies confirm that sexual exploration is normal for older adolescents.
- **Structural flaws** – The case exposes the fundamental tensions within the POCSO Act and ground realities of adolescent sexuality.
- Here, the legal crime did not cause any trauma on this particular victim but the legal consequences thereafter.
- The Supreme Court admitted that the case reflected a “total failure of legal, family, and social systems”, with the adolescent left unsupported by either the state or family.

#### What lies ahead?

- Reforms may be done in POCSO framework for considering the reality of adolescent relationship as given under international human rights law.
- It is imperative for India to reconsider age of consent laws, promote supportive frameworks, and align legal standards with adolescent psychology and international best practices.

## 5. EDUCATION

### 5.1 Unsafe Cancer Drugs

#### Why in News?

Recently a major investigation by the Bureau of Investigative Journalism has revealed that contaminated cancer drugs like *methotrexate* have been shipped to more than 100 countries around the world.

#### What are the challenges in maintaining drug quality?

- **Contamination Issues** - Staff working *without proper disinfection* processes can carry contaminants.
- Highly Sensitive Process – Even a technician moving too quickly in a clean room can create air movement that spreads *bacteria*.
- **Handling Issues** - Inadequate testing of raw ingredient, *improperly cleaned equipment and unthoroughly filtered water*, can make these lifesaving medicines become lethal.
- **Long Supply Chain** – The drugs travel through *factories, storage facilities, transport systems, hospitals and pharmacies* and at every stage of this process, the drug’s quality must remain unharmed.
- **Inadequate Testing Infrastructure** - Unlike wealthy nations with robust tracking systems, low and middle-income countries often lack the infrastructure to monitor the journey.
- For example, only seven countries in sub-Saharan Africa, have laboratories that have been approved as meeting WHO standards.
- **Administrative Issues** - Corruption issues and porous borders, pave way for the potentially counterfeit drugs to enter healthcare systems.

#### What are the consequences of unsafe cancer Drugs?

- **Affects Treatment** - Substandard or ineffective drug will affect treatment of patients undergoing chemotherapy.
- **Endangers Life** - Drugs that have not been manufactured properly can be toxic or contaminated and put a patient in immediate danger.

#### Recent Incidents of Drug contaminations

- In 2019, five young patients from Saudi Arabia developed a high fever, and one died, after taking an Indian-made medicine given at the same time as chemotherapy drugs.
- Again in 2019, four children died and more than a 100 fell ill in Colombia when given the contaminated drug.
- In 2022, at least 10 children in Yemen died after receiving methotrexate, a critical chemotherapy drug used to treat leukaemia and other cancers that had been contaminated with a deadly bacterium.
- In 2023, the Bureau uncovered a dozen poor-quality brands of a childhood cancer drug used in Brazil.

- **Affects the Credibility of India** – The revelation of reports about low quality drugs from India will affect India's image as "Pharmacy of the World".
- **Loss of Market** - The tainted pharma image will cause reduction in demand for drugs from India.
- **Impact on Pharma Economy** – The reduced demand for Indian drugs will result in production decline of pharma in India.

#### What is the role of WHO in ensuring drug safety?

- **Rapid Alert System** - WHO maintains a rapid alert system for dangerous drugs through which the drugs are assessed and an alert is then sent out to all member governments.
- **Global Benchmarking Tool** - It is a tool that assesses and rates national regulatory systems on a scale of 1 (least mature) to 4 (most mature).
- **Essential Medicines List** - A list of medications that are the safest and most effective for meeting the most important health system needs.
- Generic versions of drugs on this list could still be fake or substandard, But the existence of the list helps countries prioritise limited resources.
- **Prequalification Programs** - These are the lists that contain laboratories, specific drugs, and sources of active pharmaceutical ingredients that the WHO has inspected, evaluated, and confirmed to be acceptable for use.
- This helps governments and national regulators procure safe medicines.
- **Good Manufacturing Practices (GMP) Certification** - This ensures that pharmaceutical products are consistently produced and controlled to quality standards.
- Most countries will only accept the import and sale of medicines that have been manufactured by internationally recognised GMPs.
- It is used by pharmaceutical regulators and the pharmaceutical industry in over 100 countries.
- **WHO Certification Scheme** - A Certificate of Pharmaceutical Products (CoPP) can be requested by a country that wants to import a medicine, and it would be issued by the exporting country according to the WHO guidelines.
- It acts like a passport for medicines, proving the item is approved and safely made in the exporting country.

#### Pharmacovigilance

- World Health Organization (WHO) defines it as 'the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem.
- It is the Worldwide Master Key for Drug Safety Monitoring

#### What lies ahead?

- There could be a clear drug safety regulatory mechanism in every country to ensure the substandard drugs are not consumed by the people.

- There must be a best oversight mechanism, like the U.K model to prevent the sale and supply of counterfeit drugs.

### UK Drug Safety Mechanisms

- **Different Levels of Quality Testing** - Every batch undergoes *two rounds of quality testing*, at the manufacturing site, and then on entering the U.K.
- **Different Markers** - During each of these rounds of tests, *20 different markers* of drug quality are checked.
- **Professional Experts** - Only *specific experts*, those registered with professional bodies like the Royal Society of Chemistry, are qualified to verify each batch.
- **Regular Inspections** - The Medicines and Healthcare products Regulatory agency *regularly inspects manufacturing facilities*, both in the U.K. and abroad.

## 5.2 National Sports Policy 2025

### Why in the news?

Recently, the Union Cabinet chaired by the Prime Minister approved the National Sports Policy (NSP) 2025.

### What is National Sports Policy 2025?

- **Aim** - It is a landmark initiative aimed at reshaping the country's sporting landscape and empowering citizens through sports
- **Existing Policy** - The new policy supersedes the existing National Sports Policy, 2001.
- **Strategic Roadmap** - It lays out a visionary and strategic roadmap to establish India as a global sporting powerhouse.
- **Excellence in Sports** – To make a strong contender for excellence at international sporting events, including the 2036 Olympic Games.
- **Stakeholders** – It is the outcome of extensive consultations involving Central Ministries, NITI Aayog, State Governments, National Sports Federations (NSFs), athletes, domain experts, and public stakeholders.
- **Sports Regulatory Board** - The policy suggests setting up a Sports Regulatory Board fix ongoing problems like internal fights and poor management in sports federations.
- This board will have the authority to give, renew, or cancel the recognition of sports bodies.

### What are the key pillars of National sports policy 2025?

- **Excellence on the Global Stage** - It focuses on achieving the nation's excellence on the global stage by enhancing infrastructure, talent identification and international competitiveness.
- Encourage the adoption of sports science, sports science, medicine, and technology to boost athletic performance.
- **Sports for Economic Development** - It emphasises leveraging sports to boost industries such as tourism, manufacturing and sports technology.
- Encourage private sector participation through Public-Private Partnerships (PPPs), Corporate Social Responsibility (CSR) and innovative funding initiatives.
- **Sports for Social Development** – The policy emphasizes the role of sports in driving social inclusion by
  - Promoting participation among marginalized sections through focused programs.
  - Revitalizing and promoting indigenous and traditional games.
  - Positioning sports as a viable career option by integrating it into education.
  - Engaging the Indian diaspora through sports.
- **Sports as a people's movement** – To make sports a national movement, the policy aims to
  - Drive mass participation and a culture of fitness through nationwide campaigns and community-based events.
  - Launch fitness indices for schools, colleges, and workplaces etc.
  - Enhance universal access to sports facilities.

- **Integration with Education (NEP 2020)** - It aligns with the National Education Policy (NEP) 2020 to integrate sports with education.

### What are the Strategic Frameworks of the Policy?

- To realise its objectives, the NSP 2025 lays down a comprehensive implementation strategy.
- **Governance** - Establish a robust regulatory framework for sports governance, including legal framework.
- **Private Sector Funding & support** - Develop innovative financing mechanisms and engage private sector participation through PPPs and CSR.
- **Technology & Innovation** - Leverage emerging technologies, including AI and data analytics, for performance tracking, research, and program implementation.
- **National Monitoring Framework** - Create a national framework with well-defined benchmarks, Key Performance Indicators (KPIs), and time-bound targets.
- **Model Policy for States** - The NSP 2025 will serve as a model for States and Union Territories, encouraging them to revise or formulate their own policies in alignment with national objectives.
- **Whole-of-Government Approach** - The policy calls for integration of sports promotion into the activities, schemes, and programs of all Ministries and Departments to achieve a holistic impact.

### What lies ahead?

- With its structured vision and forward-looking strategy, National Sports Policy 2025 sets India on a transformative path toward becoming a leading sporting nation globally, while creating healthier, more engaged, and empowered citizens.

## HEALTH

### 5.3 AI-based Electronic Medical Records (AI-EMRs)

#### Why in news?

*In recent times AI-enabled Electronic Medical Records (AI EMRs) are revolutionizing healthcare by enhancing diagnosis accuracy, improving accessibility, and reducing costs.*

#### What is AI-based EMRs?

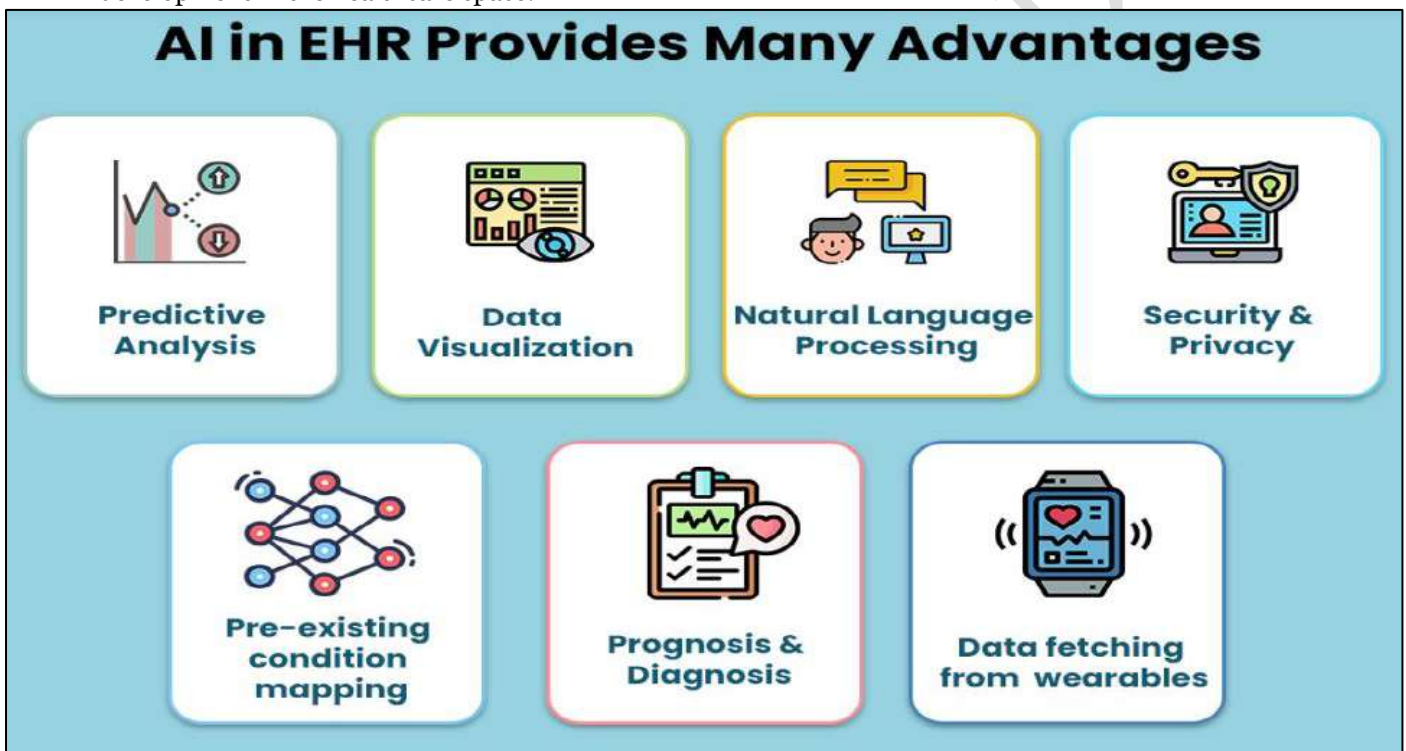
- **AI EMRs** – It is the integration of Artificial Intelligence with digital health records.
- They process patient symptoms, lab reports, and historical data to suggest accurate diagnoses and ideal treatment options.
- It acts as decision-support tools for doctors, nurses, and even patients.
- **Advantage** – Studies show AI models outperform human doctors in diagnosis accuracy, including complex medical scenarios.
- **Optimised diagnosis & treatment** – AI factors in every data point—symptoms, tests, reports.
- **Unified health records** - Consolidates patient data from multiple sources—doctors, labs, hospitals.
- **Language inclusivity** – It supports multi-language voice transcription during doctor-patient interactions.
- AI assistants interact with patients in native languages to collect medical details.

#### What is the role of AI-based EMRs in health care delivery?

- **Affordable healthcare for the masses** – AI EMRs is cost-effective, making quality healthcare accessible even to the poor and underserved.
- It also helps in reducing dependency on expensive specialist consultations.
- **Improved healthcare access in rural areas** – Rural areas suffer from a lack of qualified doctors and specialists.
- It can guide primary health workers or patients themselves by suggesting diagnoses and treatment options based on available data.

Multi language support ensures even non-English speakers benefit.

- **Better diagnosis** – AI EMRs processes vast amounts of patient data, lab reports, and medical images to provide highly accurate diagnoses.
- It is beneficial in overburdened public healthcare facilities.
- **Unified patient records across the system** – Patient health data from different hospitals, labs, and clinics can be consolidated.
- It creates a *seamless, lifelong health record* that improves continuity of care and it is useful in emergencies or when patients relocate.
- **Empowerment of patients** – AI EMRs explains complex medical information in simple, local languages.
- Patients can make informed decisions about their health and can question unnecessary treatments or expensive procedures.
- **Reducing urban-rural healthcare divide** – It reduces dependence on physical proximity to top hospitals or specialists.
- Remote villages can access AI-driven expertise via mobile phones or telehealth platforms integrated with AI EMRs.
- **Boost to Digital India & health tech sector** – It encourages start-ups, health-tech innovations, and AI development in the healthcare space.



### What are the challenges?

- **Resistance from medical community** – Many doctors see AI EMRs as a threat to their livelihood and professional authority.
- Fear that AI may replace clinical judgement or reduce patient dependence on doctors.
- **Data privacy** – Handling sensitive health data requires robust data protection mechanisms.
- India still lacks a comprehensive, fully enforced Data Protection Law specific to healthcare.
- **Security concerns** – Risks of *data leaks, misuse, or cyberattacks* remain concerned.
- **Lack of digital infrastructure** – Rural areas often face poor internet connectivity, lack of digital devices, and inadequate tech literacy.
- **Fragmented health records** – Currently, patient data is scattered across hospitals, clinics, and labs.
- Integrating this into a unified AI EMR system is technically and logistically challenging.
- **AI System accuracy** – Though AI has high accuracy, it is *not 100% error-free*.
- Overdependence on AI without human oversight could lead to misdiagnoses or treatment errors.

- **Reliability** – AI models trained on Western datasets may underperform in Indian medical conditions.
- **Legal & ethical concerns** – No clear legal and ethical framework governing AI decision-making in healthcare.
- Questions around accountability arises if AI suggests a wrong diagnosis.
- **High cost** – Initial setup of AI EMR systems can be expensive for small clinics or individual doctors.
- **Awareness barriers** – Low awareness among the public about AI EMRs limits patient-driven demand.
- Elderly or digitally illiterate patients may struggle to use AI tools.

#### What lies ahead?

- Introducing as pilot method in premier institutes like AIMS, JIPMER to analyse the effectiveness of AI EMR system.
- Patient driven use of AI EMR/PHR systems in healthcare by increased accuracy in diagnosis and treatment.
- Creating awareness among the doctors to use it as a tool for effective health care delivery.

## 6. GOVERNANCE

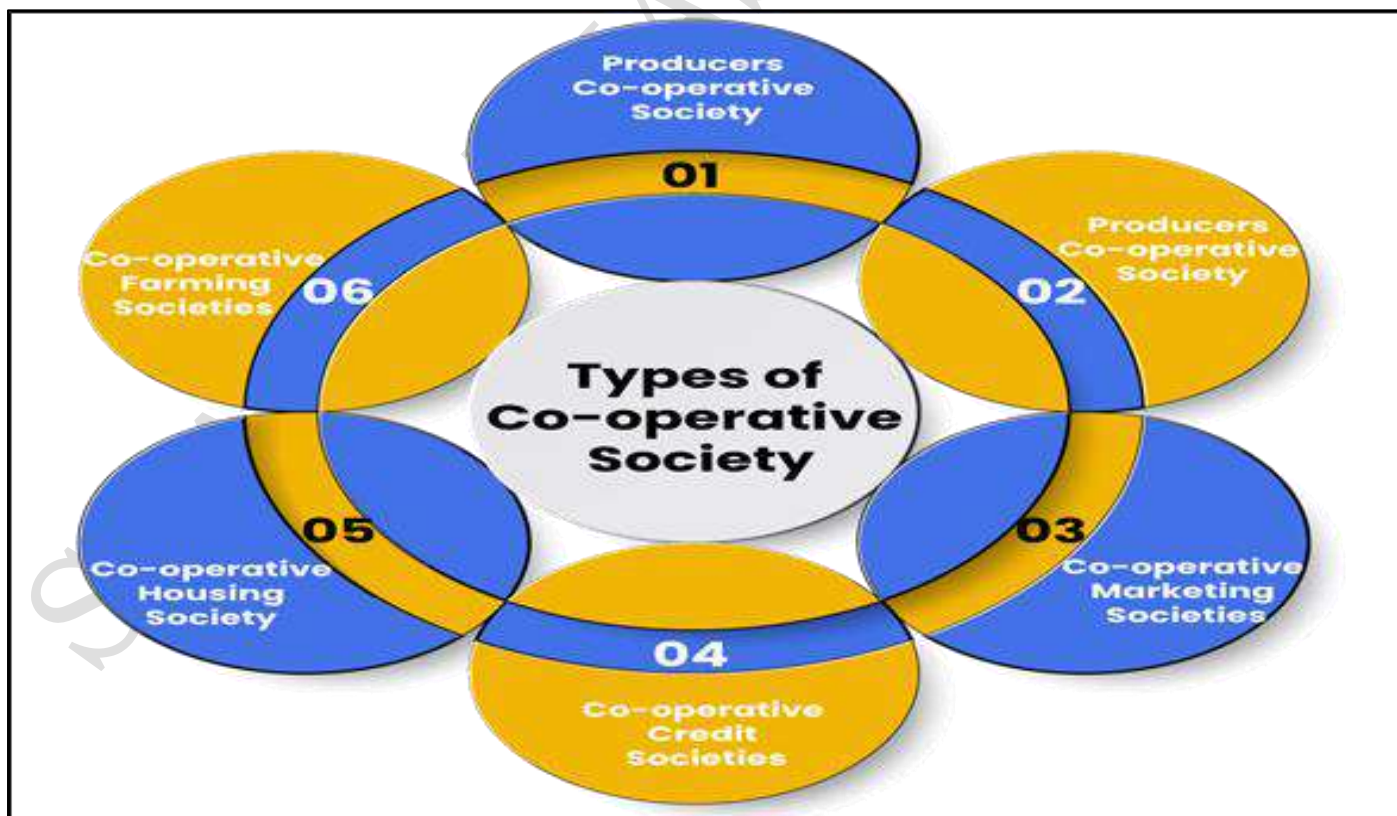
### 6.1 Cooperative Societies in India

#### Why in the news?

The International Day of Cooperatives was observed on July 5th, which highlights the role of cooperatives in promoting the welfare of people worldwide.

#### What are cooperative societies?

- **Cooperatives** - They are a self-governed group of people who voluntarily come together to work for economic, social and cultural interests.



- **Purpose** - They are formed to help their members, who are mainly from the economically weaker sections, and will serve common interests.

#### What is historical background of cooperatives societies in India?

- **Historical existence** – It is the concept of collaboration and cooperative activity that was widespread throughout India even before any legislation got established.
- **For example** - They existed in the *form of building assets* like community tanks as well as community forests.
- **Spatial distribution** - Different regions had varied forms of cooperation, such as **kuris, chit funds, bhishies, and phads**.
- **Types** – It includes agricultural cooperatives, consumer cooperatives, housing cooperatives, and banking cooperatives.

Article 19(1) (c), Article 43B, part IX B were added by 97<sup>th</sup> constitutional amendment act.

### Constitutional Provisions for Co-operative Societies

- **Seventh schedule**
  - **Entry 44 of the List I** - Union List for objects not confined to one State.
  - **Entry 32 of the List II** - State List for objects confined to one State.
- **Fundamental Rights** - Article 19(1)(c) deals with the right to form cooperative societies.
- **Directive Principles of State Policy** - Article 43B mentions about state policy for promotion of cooperatives.
- **Part IX B** - 'The Cooperative Societies' was inserted with provisions for incorporation, regulation and winding up of co-operative societies.

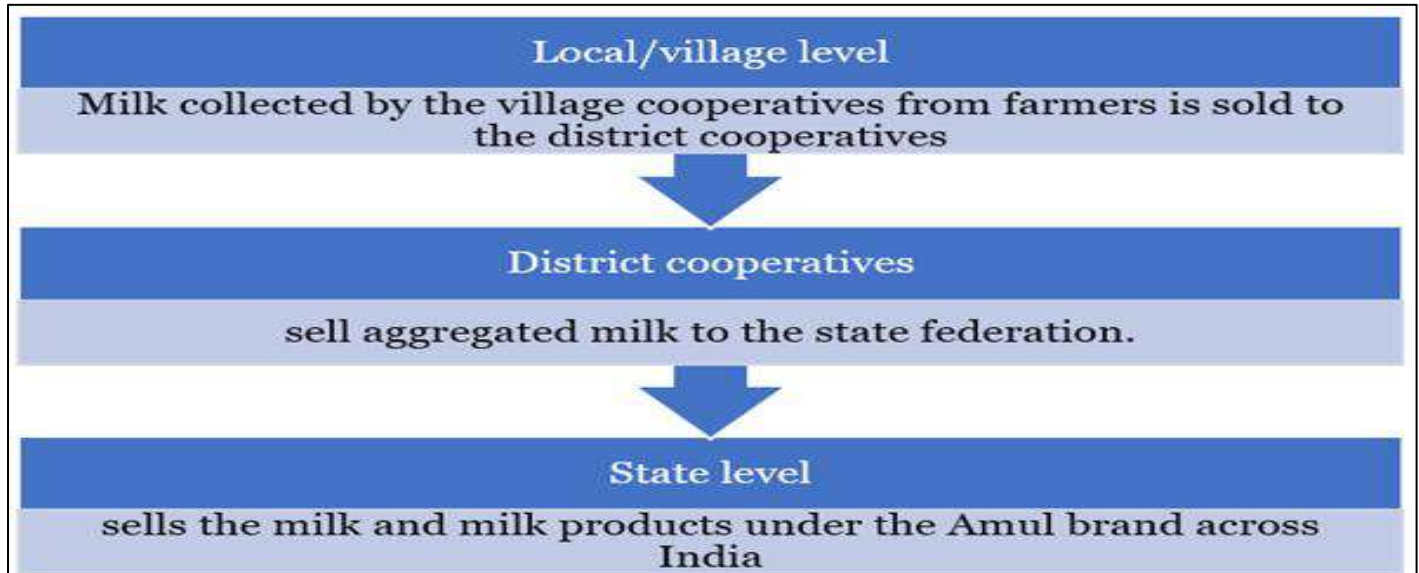
### How did modern cooperative movement evolved in India?

- **Industrial Revolution** - The aftermath of the Industrial Revolution shaped the modern cooperative movement in India in the late 19<sup>th</sup> centuries.
- **Government Committee** – A committee headed by *Sir Edward Law* enacted the **Cooperative Credit Societies Act in 1904** to address the challenges.
- It outlined the framework for establishing cooperative societies, registration, liabilities, etc.
- **India's first cooperative society** was established at Tirur in Tiruvallur district of Tamil Nadu.
- **Other statutory measures** – The **Cooperatives Societies Act 1912**, addressed the drawbacks of the 1904 Act.
- It **broadened the focus** to encompass handloom weavers, marketing groups, and other artisan societies.
- **Emergence of regional societies** -The **1<sup>st</sup> Cooperative Housing Society**, the Madras Cooperative Union was established in 1914.
- Bombay Central Cooperative Institute in 1918.
- Other establishments in Bengal, Bihar, Orissa, Punjab, and other states emerged following the 1912 Act, further fueling the impetus of the cooperative movement.

### The Success Story of Amul

- **Need** – Dairy industry prior to 1946 was highly unorganized.
- Milk collection and distribution were controlled by private traders and merchants exploited the poor farmers by arbitrarily fixing low procurement costs.
- **Formation of cooperatives** - Dairy farmers in the districts of Anand and Kheta came together to form cooperatives to have more control over the production and sale of milk.
- **Personalities involved** - Independence activist and lawyer **Tribhuvan Das Patel** established it, later **Dr Verghese Kurien and H.M. Dalaya** who expanded the scope and development..
- **Growth** - These cooperatives grew into the Gujarat Cooperative Milk Marketing Federation Ltd., later came to be known as **Amul**, marking the beginning of the **White Revolution (Operation Flood)**.
- **Core Strategy** - Establishment of a national milk grid through a cooperative model (inspired by Amul), eliminating middlemen and connecting rural producers directly to urban consumers.
- **Use of modern technology and veterinary care** – Dairy farmers provided with technology and financial mechanisms from district, state levels.

- **Establishment of a three-tier structure** – A three tier structure is established at village level, district level, state level, and to ensure efficient distribution and fair prices.
- **Impacts** – Made India the largest producer of milk in the world.
- Improved rural incomes and reduced dependency on milk imports.
- Empowered millions of rural farmers, especially women.



#### How cooperative societies help rural economies in India?

- **Uplifts rural economy** – It provides connectivity to the district and state levels, removal of middlemen, cooperatives increase livelihood opportunities.
- **Fostering financial inclusion** – It give farmers access to credit and financial services and it helped farmers to manage capital shortages and ensure real-time support.
- **For example**, Primary Agricultural Credit Societies (PACS) provides credit, input supply, and other financial services to farmers.
- **Creates jobs** – By supporting local industries, they are instrumental in the creation of jobs.
- **Skilling and Development** - Training and capacity-building initiatives helped members to improve productivity and efficiency.
- **Promotes Social Inclusion** – It promotes participation of women, small farmers, and marginalized groups thus fosters equity and self-reliance.
- **Develops local infrastructure** - Profits are reinvested in local infrastructure, education, and health, thereby driving holistic rural development.
- With over 8,00,000 cooperative societies categorised in 29 different sectors, **India has the highest number of cooperative societies** in the world.

*Dr. Verghese Kurien is the **Father of White Revolution in India.***

#### What are the measures taken in India?

- **Computerisation of PACS** - The government has initiated the computerisation of Primary Agricultural Credit Societies (PACS) to improve their efficiency and transparency.
- **Tax benefits to cooperative societies** - Benefit from reduced surcharge rates and concessional tax regimes, enhancing cooperatives income and supporting rural and farming communities.
- **Participation of PACS in LPG distributorship** - PACS are being encouraged to participate in LPG distributorship, expanding their business opportunities and community reach.
- **Convergence of the PM Kusum scheme** - Enabled farmers to adopt renewable energy solutions and support sustainable agriculture.
- Further strengthening and expanding the model of cooperative network worldwide.

#### What lies ahead?

- **Enhancing efficiency** – Adopting digital technologies and professional management can help to improve transparency, efficiency, and competitiveness.
- **Expanding cooperatives**– Interlinking over different sectors and ensuring inclusive participation could boost growth and empower members, especially women and youth.

## 6.2 Tribal Development

### Why in the News?

Ministry of Tribal Affairs has launched an outreach programme, targeting around 1 lakh tribal-dominated villages, to ensure doorstep delivery of two welfare schemes.

### What is the status of tribal population in India?

- **Population of Scheduled Tribes** - The 2011 census indicates that there are 705 Scheduled Tribes in India, comprising about 8.6% of the country's total population.
- **Particularly Vulnerable Tribal Groups (PVTGs)** - There are 75 officially recognised PVTGs across various states in India.
- **Tribal Diversity** - Tribal communities in India have diverse cultural practices, languages, and social structures.
- **Tribal Development** - Among Scheduled Tribes, communities are at varying stages of social, economic, and educational development.
- While some have adopted modern lifestyles, others still live at a pre-agricultural stage, relying on hunting and gathering for survival.

### Tribal Development Initiatives

- **Forest Rights Act (FRA), 2006** – It aims to provide legal recognition of tribal rights over forest land and resources. While the Act is a landmark in upholding tribal dignity and livelihood security, accessing its benefits remains a challenge.
- **Development Action Plan for Scheduled Tribes (DAPST)** – Launched as Tribal Sub-Plan (TSP) in 1974-75, it has evolved into the Scheduled Tribe Component (STC) and the Development Action Plan for Scheduled Tribes (DAPST).
- These plans ensured that various ministries targeted tribal welfare through a coordinated approach.
- **PM JANMAN** – It was launched in 2023, targeting the socio-economic development of 75 Particularly Vulnerable Tribal Groups (PVTG) across 18 states and one UT
- **Dharti Aaba Janjatiya Gram Utkarsh Abhiyan** – It was launched on 2nd October, 2024 to saturate infrastructural gaps in tribal villages and improve access to health, education, Anganwadi facilities and providing livelihood opportunities .
- The Abhiyan comprises of 25 interventions implemented by 17 line Ministries.
- **Eklavya Model Residential Schools (EMRS)** - These schools aim to provide quality education to ST children in remote areas, facilitating access to higher education and employment opportunities.
- **National Scheduled Tribes Finance and Development Corporation (NSTFDC)** - It provides financial assistance to ST beneficiaries at concessional interest rates, focusing on income-generating activities.
- **Tribal Cooperative Marketing Development Federation of India (TRIFED)** - It promotes tribal products through its TRIBES India outlets and e-commerce platforms, providing sustainable livelihood opportunities to tribal artisans.
- By promoting handicrafts, textiles, and other tribal products, TRIFED creates market linkages for these communities.

### What are the problems faced by tribals?

- **Loss of Ancestral Lands** – Tribes are often displaced from their traditional lands due to large-scale development projects (dams, mines, industries), deforestation, and urban expansion.
- **Exploitation and Indebtedness** - Tribals often fall prey to moneylenders and middlemen who exploit them through high-interest loans and unfair trade practices, leading to a cycle of debt.

- **High Incidence of Diseases** - They suffer from higher rates of malnutrition (especially among women and children), infectious diseases, and poor maternal and child health outcomes.
- Tribal populations in India face a disproportionate burden of various diseases, including infectious diseases like malaria, tuberculosis, and leprosy
- **Illiteracy** - The literacy rate for Scheduled Tribes (STs) in India, according to the 2011 Census, was 59% which is significantly lower than the overall national literacy rate of 73%.

#### What are the challenges in tribal development?

- **Remote Location** - Most reside in ecologically fragile and inaccessible regions such as forests, hills, and remote rural areas.
- These settlements often make it difficult for government welfare schemes to reach them.
- **Subsistence Livelihood** - Their livelihoods depend primarily on subsistence agriculture, forests, and traditional occupations.
- **Lack of Secure Tenure** - Many tribal communities lack formal land titles or recognized rights, making them vulnerable to land alienation and exploitation by external parties.
- **Education in Mother Tongue** – There are limitations such as diversity of tribal languages, non written form of the languages and shortage of human resource, in providing education in mother tongue to tribals.
- **Bureaucratic Dominance** - Bureaucratic nature of implementing tribal development programmes often overlooks the involvement of tribal communities in decision-making and reduces their effectiveness.

#### What needs to be done for tribal development?

- The development of tribal communities in India is a complex, ongoing process that requires a multi-pronged and sensitive approach.
- Effective Implementation of PESA (Panchayats (Extension to Scheduled Areas) Act, 1996) to grant self-governance to tribal communities.
- Recognition of individual and community forest rights can be strengthened.
- Providing demand-driven skill development and vocational training programs tailored to their specific needs.
- Following tribal panchsheel formulated by Jawaharlal Nehru ensures that development approach respects tribal identity, culture, and self-determination.

#### Tribal Panchheel

- People should develop a long line of their own genius and nothing should be imposed on them.
- Tribal rights in land and forest should be respected.
- We should try to train and build up a team of their own people to do work of administration and development.
- We should not over-administer these areas or overwhelm them with a multiplicity of schemes.
- We should judge the result not by the statistics of the amount of money spent but by the quality of human character that is evolved.

### 6.3 Technology for the Empowerment Women and Children

#### Why in the News?

*Over the last decade, the Ministry of Women and Child Development has strengthened access to nutrition, education, legal safeguards, and essential entitlements.*

#### How are technology used in government schemes for women empowerment?

- **Modernization of Schemes** - Saksham Anganwadi initiative, designed to modernise and empower over 2 lakh Anganwadi centres across India.
- **Effective Service Delivery** – They are being upgraded with smart infrastructure, digital devices, and innovative learning tools, enabling more effective delivery of nutrition, healthcare, and pre-school education services.

- **Evidence-Based Policy Interventions** - The integration of services provided by 14 lakh Anganwadi centres across the nation with the Poshan Tracker has enabled real-time data entry, performance monitoring, and evidence-based policy interventions.
- **Capacity Building of Anganwadi Workers** - By equipping Anganwadi workers with smartphones and comprehensive training, the initiative ensures quality service delivery at the last mile.
- **Reduces Leakages** - Facial recognition system has been introduced in Supplementary Nutrition Programme to ensure that eligible beneficiaries alone receive nutrition support.
- **Bridges Rural Urban Divide** - Poshan Tracker reimagines Anganwadi centres as digitally empowered community hubs that bridge the urban-rural divide.
- **Ensures Safety and Support** - SHe-Box portal provides single-window access to every woman to lodge complaints under the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.
- **Integrates Assistance to Women** - Mission Shakti dashboard and mobile app provide integrated assistance to women in distress, connecting them to the nearest one-stop centre, now operational in nearly every district.
- **Promoting Positive Reinforcement for Daughters** – Under Pradhan Mantri Matru Vandana Yojana (PMMVY) cash benefits are provided through direct benefit transfer.
- PMMVY is a fully digital programme leveraging Aadhaar-based authentication, mobile-based registration, doorstep assistance from Anganwadi/ASHA workers, and real-time dashboards.
- **Economic Empowerment** – Government eMarket Place (GeM) enables women and self help groups to sell their products online.

#### What are the outcomes?

- **Increase in Sex Ratio at Birth** - The latest reports from the Health Management Information System of the Ministry of Health and Family Welfare (MoHFW) reveal that the Sex Ratio at Birth has increased from 918 (2014-15) to 930 (2023-24).
- **Decline in Maternal Mortality Rate** – It has declined to 97 per 1,000 births (2018-20) from 130 per 1,000 births (2014-16).
- **Child Protection and Welfare** - Under the Juvenile Justice Act (Care and Protection of Children) Act, 2015, the Ministry has strengthened the adoption ecosystem through the CARINGS portal (Child Adoption Resource Information and Guidance System).
- **Strengthening Supervisions** - Digitisation has also improved monitoring of child care institutions, foster care placements, and statutory support structures under the Act.
- Platforms developed by the National Commission for Protection of Child Rights are tracking violations of child rights.
- **Better Coordination** - The Mission Vatsalya dashboard strengthens convergence and coordination among various child welfare stakeholders.

#### What are the challenges in using technologies for women empowerment?

- **Lack of Access to Digital Devices** - Women face economic constraints that limit their ability to afford smartphones, computers, or reliable internet access.
- **Inadequate Digital Literacy** - Data from the 78th round of the National Sample Survey 78th indicates that only 21% of all women above the age of 15 having some form of digital literacy.
- This reduces their ability in harnessing benefits provided by digitalized schemes.
- **Infrastructure Limitations** - Poor or non-existent infrastructure (electricity, reliable internet service) in rural or remote areas disproportionately affects women who often have less mobility to access public tech facilities.
- **Online Harassment and Discrimination** - Women often face specific threats online, including harassment, privacy breaches, stalking, and non-consensual sharing of images, which can deter them from using digital platforms.

#### What lies ahead?

- Capacity development of women through digital literacy program and hand on training can enhance their ability to directly access digital services.
- Strengthening public digital infrastructures in remote places like hilly, terrain and rural places.

- Use of advanced technologies like artificial intelligence, big data to make government schemes proactive and reduce exclusion of beneficiaries and make them inclusive.

## 6.4 Civil Nuclear Liability Laws in India

### Why in news?

Recently, the government of India decided to amend the two major nuclear laws of the country, Civil Liability for Nuclear Damage Act (CLNDA), 2010 and Atomic Energy Act, 1962.

### What is civil nuclear liability law?

- **Basis** – It is to ensure that compensation is available to the victims for nuclear damage caused by a nuclear incident or disaster.
- **International nuclear liability regime** – It consists of multiple treaties and was strengthened after the 1986 Chernobyl nuclear accident.
- **Convention on Supplementary Compensation for Nuclear Damage (CSC)** – It was adopted in 1997 with the aim of establishing a minimum national compensation amount.
- India was a signatory and to keep in line with the international convention, India enacted the CLNDA in 2010.
- **Vienna Convention on Civil Liability for Nuclear Damage** – It aims at establishing some minimum standards to provide financial protection against damage resulting from certain peaceful uses of nuclear energy.

### What are the aspects of Civil Liability for Nuclear Damage Act (CLNDA), 2010?

- **Basis** – It has been enacted with a view to provide prompt compensation to the victims for damage caused by a nuclear incident through a no-fault liability regime.

## Civil Liability for Nuclear Damage Act (CLNDA), 2010

- Compensation to victims through a no-fault regime.
- Exclusive jurisdictional competence and a mechanism to provide compensation.
- Channelling liability to the Operator.
- Limiting liability of the operator in amount and time.
- Mandatory coverage by the operator through financial security or insurance.

- It was also meant to facilitate India becoming a State Party to CSC.
- **No-fault liability** - Nuclear plant operators are liable for damage regardless of fault.
- **Right of recourse** – It channelised operators' liability to suppliers through a provision called the right of recourse of the operator.
- Section 17 says, that the operator of the nuclear installation, after paying the compensation for nuclear damage, shall have the right to recourse where:
  - a. Such right is expressly provided for in a contract in writing.
  - b. The incident has resulted because of an act of supplier or his employee.
  - c. The incident has resulted from the act of commission/omission of an individual done with the intent to cause nuclear damage.

**Operator of a nuclear plant** would typically be a company such as the state-owned Nuclear Power Corporation of India Ltd (NPCIL).

**Suppliers** of nuclear plant could include foreign reactor manufacturers such as Westinghouse or Framatome, but also domestic equipment suppliers such as L&T or Walchandnagar Industries.

### What is Atomic Energy Act, 1962?

- **Basis** – It *replaced the Atomic Energy Act of 1948* and provided a more comprehensive framework for **supporting the nuclear policy in India.**
- **Major provisions** – It provides for the *development, control, and use of atomic energy* for the welfare of the people of India and for other peaceful purposes.
- **Authority** - The central government through the *Nuclear Power Corporation of India (NPCIL)* holds the authority for activities related to nuclear energy, including its production, development, use, and disposal.

**"Atomic Energy"** means energy released from atomic nuclei as a result of any process, including the fission and fusion processes.

### What are the challenges in India's civil nuclear liability provisions?

- **Vague definition** - The term *supplier* is seen to be too broad in scope which is cause for worry for Indian sub-vendors.
- **Fear of incurring future liability** - Section 17 (b) of CLNDA is cited as an *impediment by foreign suppliers* due to fear of incurring future liability in the event of a nuclear accident.
- **No investments** - None of the foreign companies have invested in a single project in India since the legislation came into force because liability risks.
- **Restrictions to private companies** – The atomic energy Act *restricts private companies* from owning and operating nuclear power plants in India.
- Its 2015 amendment allowed NPCIL to form joint ventures with other public sector units (PSUs) to secure funding for new projects, but it does *not extend to private or foreign companies.*

### What are the proposed amendments?

- **Clear definition of a supplier** – Provision to clarify the definition of a supplier and to *include domestic sub-suppliers.*
- **Reforming section 17 of CLNDA** – It is proposed to bring Section 17 *on par with international benchmarks.*
- **Inclusion of private companies** – Enabling mechanism to include private players and foreign players at a later stage, to enter nuclear generation as operators.
- **Foreign companies' participation** – Provisions to enable foreign companies to potentially take a *minority equity exposure* in upcoming nuclear power projects.

### What are future prospects of the proposed amendments?

- **In line with CSC** - The amendments in the CLNDA would effectively bring India's nuclear liability legislative framework in line with the provisions of the 1997 *Convention on Supplementary Compensation for Nuclear Damage (CSC).*
- **Promote investments** - Alignment with international standards will *encourage U.S. and French companies* to invest in India's nuclear energy projects.
- **Revive halted projects** – They have the potential to *revive long-pending contracts* signed over a decade ago, for nuclear power expansion.
- **Support clean energies** - This can *reduce India's dependence on fossil fuels* and help achieve clean energy targets.
- **Encourage ppp (public private partnership)** - Amendments to the Atomic Energy Act 1962 may enable greater involvement of domestic and international private players.

### What lies ahead?

- Efforts can be taken to bring political consensus to clear the amendment provisions to reform the nuclear liability landscape in India.

### Quick Facts

#### Convention on Supplementary Compensation for Nuclear Damage (CSC)

- **Signed in** – 1997
- **Objectives** – To set parameters on a nuclear operator's financial liability.
- To supplement and enhance the measures to increase the amount of compensation for nuclear damage.

- **Governing body** - International Atomic Energy Agency (IAEA).
- **Signatories** - 40+ countries, *India is not a signatory*.
- **Membership eligibility** – A country that is a party to either the 1963 Vienna Convention or the 1960 Paris Convention could automatically become a party to the CSC.
- A country that was not a party to either of these conventions could also become a party to the CSC if its national law on nuclear liability were to follow the provision of the CSC and its annexures

### Vienna Convention on Civil Liability for Nuclear Damage (1963)

- **Enacted in** – 1963, under the International Atomic Energy Agency (IAEA) framework.
- **Provisions** - It establishes civil liability for nuclear damage and ensures compensation for victims of nuclear incidents.
- It Places *exclusive liability on nuclear operators*, ensuring swift compensation and requires *mandatory financial security* (e.g., insurance) for nuclear operators.
- **Signatories** – 193+ countries.
- *India is not a signatory*.

## 6.5 Custodial Deaths in India

### Why in the news?

The recent custodial death of Ajith Kumar, a 27-year-old temple guard in Tamil Nadu has sparked public dissent and debate over custodial violence.

### What is custodial death?

- **Custodial death** – It refers to ***death of an individual in the custody of a law enforcement***.
- **Forms** - It can encompass deaths in *police custody, prison, or other detention settings*.
- **Causes** - Natural causes like illness or may also happen due to suicide, infighting among prisoners or police brutality and torture.

### What are its negative impacts?

- **Violates constitutional provisions** – The extrajudicial methods undermine constitutional governance such as
  - **Article 20(3)** - Protection against self-incrimination violated due to forced incrimination.
  - **Article 21** - Right to life and personal liberty, including protection from torture.
  - **Article 22** - Safeguards against arbitrary arrest and detention.
- **Loss of life** - Frequent *deaths often due to signs of tortures* and injuries, ending up with disabilities.
- **Loss of trust** - Public credibility in law enforcement and the justice system severely undermined.
- **Affects mental health** - Trauma for victims, families, and even officers, some driven to suicide.

### How they are regulated in India?

- **Constitutional protection** - The *Right to life under Article 21* of the Constitution serves as the foundation, making custodial deaths a violation of fundamental rights.
- **Other regulations**
  - **Section 176(1) CrPC** - mandatory magisterial inquiry
  - **Section 46 & 49 CrPC** - limit use of force/restraints
  - **Sections 330–331 IPC** - punishment for custodial torture
- **NHRC guidelines** - Immediate reporting by District magistrates and superintendents of police must inform the National Human Rights Commission (NHRC) within 24 hours of any custodial death.
  - **Autopsy protocol** - Post-mortems must be video-recorded and the report submitted, along with a magistrate inquiry's findings, to the NHRC.

- **Judicial oversight** - In *D.K. Basu v. State of West Bengal*, the Supreme Court mandated detailed procedures for arrest, detention, and reporting to prevent rights violations.
- **Magisterial inquiry** - Section 176 CrPC (now Section 196 of the Nagarik Suraksha Sanhita, 2023) requires that custodial deaths be inquired by a judicial magistrate, not the executive, to ensure impartiality.
- **Mandatory FIR** - Police must register a First Information Report (FIR) and investigate deaths neutrally, often by a different agency.

#### What are the challenges in addressing custodial deaths?

- **Outdated curriculum** - A curriculum designed in the pre-liberalisation era cannot address the needs of modern India.
- **Lack of accountability** - There is ineffective implementation of constitutional provisions by law enforcement authorities, frequent violations due to pressure.
- **Impunity** - Police often use torture to extract confessions, with limited consequences and mere suspensions cannot address core problems.
- **Legal gaps** - *Absence of anti-torture law* at the national level and non-ratification of the UN Convention.

#### What measures can be taken?

- **Enhance legislative clarity** - Ensuring a national level legislative clarity by enacting a comprehensive anti-custodial violence law.
- **Digital surveillance** - Mandate CCTV cameras in all custodial facilities, use body-worn cameras, and implement digital record-keeping to deter abuse and ensure evidence preservation.
- **Ensure rights awareness** - The detainees or the accused persons should be provided with legal safeguards provided by the constitution and need to rise awareness about the same.
- **Increasing budgetary allocation** - Increase funding for police infrastructure, independent oversight bodies, and forensic facilities to reduce reliance on confessions and promote transparency.
- **Promote police welfare** - Reallocate police budgets to prioritize officer mental health, welfare, and counseling services to reduce stress-induced misconduct and improves police-community relations.
- **Instigating ethical standards** - Regular training on human rights, legal procedures, and non-coercive investigation methods to instil accountability and respect for detainee rights.
- **Establishing fast-track courts** - These courts could explicitly handle custodial death cases to ensure timely justice.
- **Timely redressal** - Time-bound investigation mechanisms, mandatory video documentation of interrogations, and civil society involvement in oversight investigations needed.

**UN Convention Against Torture (UNCAT)** aims to prevent torture and other acts of cruel, inhuman, or degrading treatment or punishment worldwide.

#### What lies ahead?

- Supreme Court guidelines (DK Basu case) on arrest and detention can be implemented.
- Anti-torture law can be formed to align with international standards efforts can be taken to ratify the UN Convention against Torture.
- NGOs, human rights organizations, and local communities can be involved in monitoring, reporting, and supporting victims, fostering a culture of accountability and transparency.

## 7. INTERNATIONAL RELATIONS

### 7.1 Outcomes & Challenges of 3rd UN Ocean conference (UN-OC3)

#### Why in news?

Recently, the Third UN-Ocean conference held in Nice, France to discuss measures to conserve the oceans.

#### Why conservation of ocean is important?

- **Oceans** - It is a continuous body of salt water that is contained in enormous basins on Earth's surface.
  - **Examples:** Pacific Ocean, Atlantic Ocean.

- **Wealth generator** – Oceans produce wealth with an estimated annual worth of \$1.5 trillion, making it the world's seventh-largest economy.
- **Producer of Oxygen** – It generates 50% of the oxygen we need.
- **Carbon sink** - It absorbs 30% of all carbon dioxide emissions
- **Heat absorber** - It takes about 90% of excess energy added to the Earth's by human activities.

### Global measures for Ocean Conservation

- **30x30 target** - It is the Kunming-Montreal Global Biodiversity Framework, which involves conserving at least 30 % of land, inland water, marine and coastal areas by 2030.
- **Net-Zero Framework** - International Maritime Organization (IMO) rolled out the framework to impose a pricing mechanism for global shipping emissions and a new fuel standard for ships which will come into effect from 2028.
- **SDG 14** – Sustainable development Goal 14 is about conserving and sustainably using the oceans, seas, and marine resources which has 10 targets.
- **Voluntary commitments** - Many Nations announced a flurry of contributions.
  - **For example**, The European Union pledged around \$1.14 billion for restoring ocean health & supporting coastal communities.

### What is UN Ocean Conference?

- **Established in** – 2017
- **Objectives** - To Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.
- **Participants** – Heads of various nations, members from civil society, business, and science.
- **Previous conferences**- New York (2017), Lisbon (2022).

### Third UN – Ocean conference

- **Held in** – 2025 in Nice, France.
- **Co-hosted by** - France and Costa Rica.
- **Theme** - Accelerating action and mobilizing all actors to conserve and sustainably use the ocean.

### What are the outcomes of 3<sup>rd</sup> UNOC?

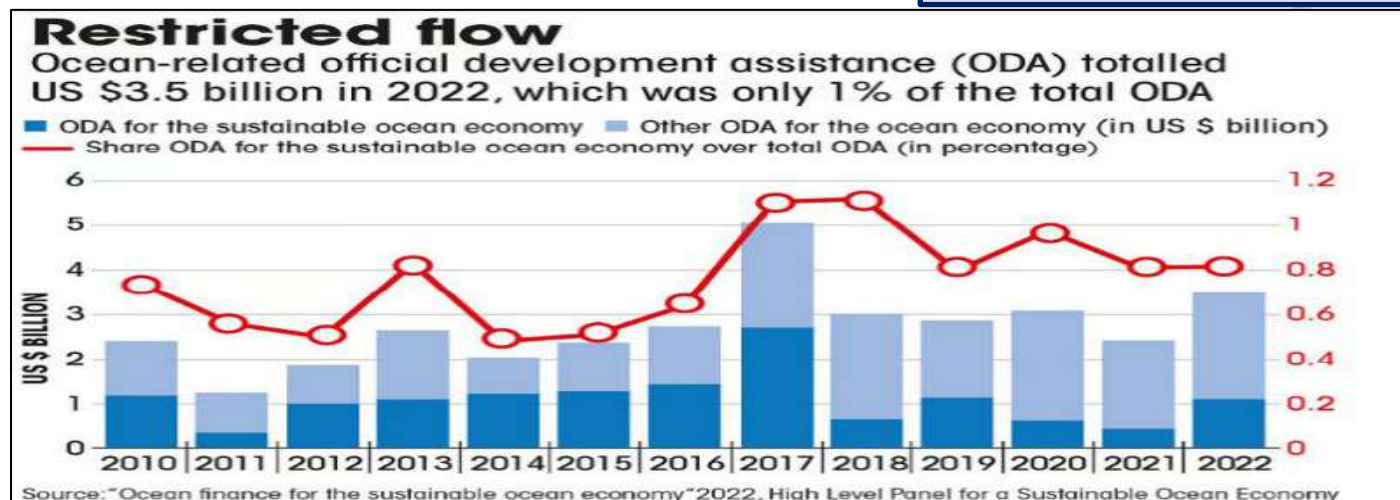
- **One Ocean Finance Facility** – A blended finance tool to unlock funding from ocean dependent industries.
- **Blue bonds** – It is a contract between the borrower (the government, for instance) and the lender (investors), allowing the former to raise money from investors for ocean-friendly projects.
- **Debt-for-nature swap** – It involves purchasing foreign debt and converting it into local currency to fund conservation activities,
- **Parametric insurance** – It is a tool where payouts are triggered automatically when a specific event such as a heatwave, flood, or poor air quality – exceeded a predefined limit.
- **Global Fund for Coral Reefs (GFCR)** – It is public-private partnership launched in 2020 by UN members that aims to mobilize \$500 million in grants and capital.
  - So far, GFCR-supported reef-positive solutions have received \$87.47 million in funding.
- **Business in Ocean** – More than 80 companies from 25 countries endorsed the “Business in Ocean” call to action, pledging to integrate ocean risks into strategy.
- **Nice Ocean Action Plan** – It had been adopted, consisting of a political Declaration and numerous voluntary commitments.

### What are the challenges associated with the pledges of 3<sup>rd</sup> UNOC?

- **Delay in launch** - One Ocean Finance Facility will be launched only in 2028, two years before the SDG 14 deadline, which prompts scepticism over its ability to act in time.
- **Debt crisis** - People in 54 countries are currently living in financial crisis, thus issuing new bonds without addressing existing debt could exacerbate the problem.
- **Oversight of foreign entities** - Debt-for-nature swap can lead to oversight of foreign entities who can insert a set of conditionality's that prioritizes investor returns.
- **Data insufficiency** - Parametric insurance has potential giving out pre-agreed pay-outs based on measurable environmental triggers, But Underlying data is a biggest hurdle.

- **Financial crunches** - The *fund is lower* than what is believed could be achieved as per the “Ocean Finance for the Sustainable Ocean Economy” report released ahead of UNOC3.
- There is an estimated 92 % or *\$14.6 billion shortfall in annual funding* to meet the 30x30 target.
- **Decline in assistance** - The official development assistance (ODA), fell by 7.1 % compared to 2023.
  - **For instance**, in 2025, the US began to dismantle its aid program and the UK plans to reduce aid to 0.3 % of gross national income, against the required ODA of 0.7.

**The official development assistance (ODA), is government aid that promotes and specifically targets the economic development and welfare of developing countries.**



**What lies ahead?**

- We need sustainable solutions, capacity building and knowledge sharing in developing countries to make the ocean conservation a reality.
- There could be a multipronged strategy and science-driven ocean literacy for ocean conservation.

**Quick Facts**

**Ennore Coastline**

- **Geography** – It is located in Chennai, Tamil Nadu.
- It is surrounded by the *Kosasthalaiyar River* on 2 sides and the Bay of Bengal on the other side.
- **Loss of biodiversity** - National Green Tribunal in 2022 reveals that the area’s *wetlands and mangroves have shrunk* by nearly 70 per cent – from 889 hectares in 2016 to just 278 hectares by 2022.
- **Coastline erosion** - *National Centre for Coastal Research* documented in 2006 that the coastline north of Chennai had already lost 350 hectares to the advancing sea.
- **Loss of revenue** - There could be an estimated \$8.4 trillion loss in assets and revenues, according to “Navigating Ocean Risk”, a 2021 report by global non-profit WWF and consulting company Metabolic.
- **Measures** - The state is drawing up a plan that includes restoring mangroves to arrest more impacts.
- The construction of **groynes** (structures to check coastal erosion) has temporarily halted erosion,
- **External assistance** - Tamil Nadu *secured a World Bank loan* to enhance coastal biodiversity, resilience and abate pollution in Ennore and other coastal regions.

**7.2 International Financial Architecture**

**Why in the News?**

Recently Union Finance Minister advocates for reforms in international financial architecture to ensure MDB funds are used for development purposes.

**What are the components of international financial architecture?**

- **International Financial Architecture (IFA)** – It refers to the comprehensive framework of institutions, policies, rules, and practices that govern the global financial system.
- **Objective** – Its primary purpose is to
  - Facilitate international financial flows
  - Promote global monetary and financial stability
  - Support international trade and investment
  - Enable the mobilization of stable and long-term financing for economic development
  - Addressing global challenges like climate change
  - Achieving the Sustainable Development Goals (SDGs)

### Key components of the IFA

- **Public International Financial Institutions** - Such as the International Monetary Fund (IMF), World Bank Group, multilateral development banks, and global funds (e.g., Green Climate Fund).
- **Financial Standard-setters** - Organizations that set norms for private finance governance, including
  - Financial Stability Board
  - Bank for International Settlements
  - International Organization of Securities Commissions
  - International Accounting Standards Board.
- **Regulatory Frameworks** - Rules and standards that guide global financial markets and cross-border financial flows.
- **Monetary Arrangements** - Such as regional financial arrangements and the network of bilateral swap lines.
- **Informal Country Groupings** – Those groupings that act as norm-setters, such as the Group of Seven (G7) and Group of 20 (G20)
- Formal but non-universal norm-setting bodies, in particular the Organisation for Economic Co-operation and Development (OECD)
- **Rules, Policies, and Agreements** - This includes a vast array of international treaties, conventions, codes of conduct, and customary practices that govern areas such as:
  - Exchange rate regimes
  - Capital controls
  - Debt resolution frameworks (e.g., Paris Club, Common Framework for Debt Treatments)
  - International trade rules (e.g., World Trade Organization agreements)
  - International tax cooperation (e.g., efforts to combat tax evasion and avoidance)

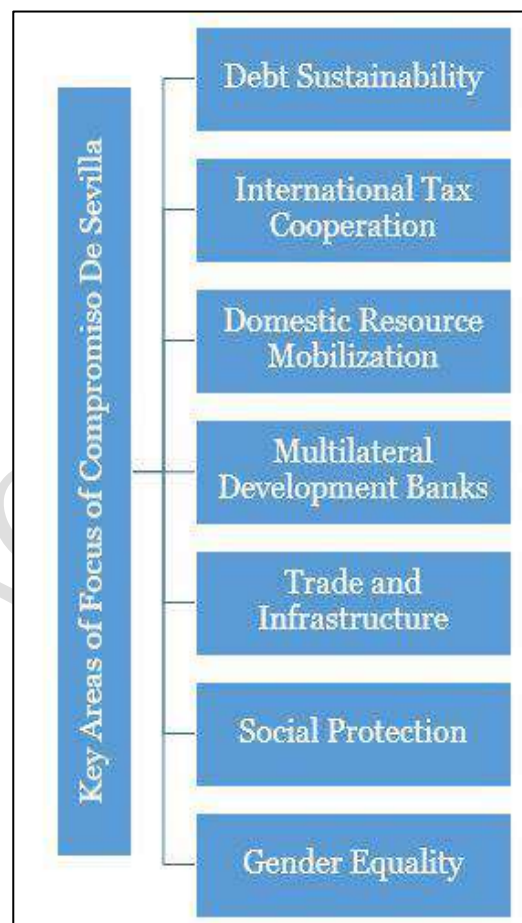
### What are issues with international funding ecosystem?

- **Dominance of Developed Countries** - The IFA, particularly institutions like the IMF and World Bank (known as the Bretton Woods Institutions or BWIs), was largely designed by and for industrialized countries after World War II.
- Voting shares and leadership positions are disproportionately held by wealthy nations, giving them undue influence over decision-making and leads to a structural under-representation of the Global South.
- **Gentleman's Agreement** - A long-standing informal agreement ensures that the head of the IMF is European and the head of the World Bank is American, further entrenching the imbalance of power.
- **Massive Financing Gap** - There is an estimated annual financing gap of \$4 trillion for developing countries to achieve the Sustainable Development Goals (SDGs) by 2030.
- **Insufficient MDB Lending** - While Multilateral Development Banks (MDBs) are vital, their lending capacity is often seen as insufficient to meet the growing demands
- **Declining Official Development Assistance (ODA)** - ODA from high-income countries is under pressure due to domestic fiscal constraints and competing priorities.

- **One-Size-Fits-All Approach** - Critics argue that IFIs often apply uniform policy solutions that do not adequately reflect the unique political, social, and economic circumstances of individual countries, especially fragile and conflict-affected states.
- **Diversion of Development Funds** – Some countries have allegedly diverting funds from International Monetary Fund (IMF) and the Asian Development Bank (ADB) towards increased military expenditure rather than towards developmental purposes.

### What is Compromiso de Sevilla?

- **Compromiso de Sevilla (Seville Commitment)** – It is the outcome document of the Fourth International Conference on Financing for Development (FFD4), held in Sevilla, Spain.
- **Adoption** - It was intergovernmentally negotiated and adopted by UN Member States to lay the foundation for a renewed global framework for financing sustainable development.
- **Renewed Global Financing Framework** - It serves as a cornerstone for a revitalized global framework for financing sustainable development, building upon previous agreements like the Addis Ababa Action Agenda (2015).
- **Addressing the Financing Gap** - A primary goal is to tackle the widening \$4 trillion annual financing gap faced by developing countries in achieving the Sustainable Development Goals (SDGs) by 2030.
- **Mobilizing Resources** - The commitment aims to catalyze a large-scale investment push from all sources (public, private, philanthropic) and make the international financial architecture more responsive to countries in need.
- **Multilateralism** - Despite some divisions and the withdrawal of the United States from negotiations, the adoption of the Compromiso de Sevilla by consensus is seen as a demonstration that multilateralism can work and deliver results.
- **Sevilla Platform for Action (SPA)** - Launched alongside the Compromiso de Sevilla, the SPA brings together over 130 initiatives designed to implement the commitments of the outcome document.



### What can be done?

- India has been demanding reforms to the international financial architecture to enhance inclusivity and equity, including MDB reforms and fairer credit rating systems.
- MDB lending needs to be aligned with long-term development goals and backed by robust monitoring frameworks to ensure that funds are used as intended.

## 7.3 Buddhist Diplomacy

### Why in news?

*In recent times, the real geopolitical frontier between India and China lies not in the oceans but in the Himalayas, where Buddhism has become a geopolitical chessboard.*

### Why Buddhism in Himalayas is strategically important?

- **Himalayan Buddhism** - The Himalayas and Buddhism are synonymous, for the Buddha himself was born in the foothills of the Himalayas.
- Early Indian Buddhist Sutras probably arrived in the Himalayas when Buddhism was spreading into China and Central Asia in the 2<sup>nd</sup> century.
- **Geo-political importance** - In the Himalayas, where territory is often inaccessible and infrastructure scarce, soft power is hard power.

***Buddhism**, one of the major world religions, began in India around the sixth century, B.C.E. The teachings of Buddhism spread throughout Central and Southeast Asia, through China, Korea, and Japan. Today, there are Buddhists all over the world.*

- Monasteries that once served as centres of meditation and monastic education now sit at the frontlines of national power games.
- **Sovereign power** – The reincarnation of lamas has become a matter not just of religion but also of sovereignty.
  - For instance, in regions such as Ladakh, Tawang, and even remote Bhutan, Buddhist culture is increasingly shaped not only by the sacred but also by strategy.
- **Indo-China power war** – Both India and China understand that influence over Himalayan Buddhism is influence over identity, and in borderlands where lines on a map are fuzzy, identity is everything.

### How Chinese approach over Buddhism evolved?

- **Buddhism as Statecraft** – Chinese see the influence over the *Himalayan Buddhism as the skillful management of state affairs*.
- **Dominance over lamas** – Since the 1950s, Beijing has worked to dominate Tibetan religious life.
- It exiled or marginalized independent lamas, co-opted institutions, and crucially claimed the sole right to approve reincarnations.
- **Political supremacy over spiritual legitimacy** - In 2007, the Chinese government formally asserted that *any “Living Buddha” must be sanctioned by the state*.
- They pose spiritual legitimacy flows from political authority.
- **Watchdog of lamas** - It *maintains a database* of officially recognised reincarnate lamas and monitors monastery activities across Tibet.
- **Diplomacy campaigns** – Sacred sites are being repurposed as instruments of soft power.
- Roads led to shrines were built with Beijing’s help.
- **Regional developments** – In Nepal, it has invested heavily in Buddhist infrastructure, especially around Lumbini, the Buddha’s birthplace.
- In Bhutan, it subtly courts monastic communities even as the kingdom maintains a tight control over religious affairs.

*In Tibetan Buddhism, a **lama** is a spiritual teacher who transmits the teachings of Buddhism to their students and guides them on the spiritual path.*

### How India’s Buddhist diplomacy evolved?

- **Revival of Buddhism** – Post independence, India made a special *effort to improve upon a situation* after Buddhism falling behind, often in a competition, performance, or a general sense of progress.
- **Relationship with Lama’s** – *Hosting the Dalai Lama* and the *Tibetan exile government* since 1959 gave India a moral power.
- **Diplomatic tool** – India leverages Buddhism as a soft power tool *to strengthen cultural and diplomatic ties* with Asian countries sharing Buddhist heritage.
- **Spiritual homeland of Buddhism** – India through its initiatives like international conferences, heritage restoration, and Buddhist circuit tourism, promotes itself to foster goodwill and regional cooperation.
- Only in the last decade has New Delhi begun to engage seriously by promoting India’s heritage as the Buddha’s birthplace and funding regional pilgrimage circuits.
- **Challenges** – These efforts remain fragmented when compared to China’s centralized vision.

### What are challenges associated with Buddhist diplomacy?

- **Reincarnation issues** – The *current 14<sup>th</sup> lama* who turned 90 recently, has motioned that he wants to *reincarnate outside Chinese territory mostly in India*.
- **China’s counter move** – Beijing, predictably, has vowed to appoint its own Dalai Lama, using the centuries-old *“Golden Urn”* method.

### Golden Urn Method

- **Established by** – Qing dynasty in 1792
- **Purpose** – For selecting reincarnated Tibetan Buddhist leaders, particularly the Dalai and Panchen Lamas.

- It was intended to *standardize the selection procedure and reduce corruption*, while also consolidating the Qing dynasty's control over Tibetan affairs.
- **Method** – It is *kind of lottery system*, which involves placing slips of *paper with candidates' names into a golden urn* and drawing one to determine the rightful reincarnation.

- **Dual leaders** – One Dalai lama recognized by the Tibetan exile community and much of the global Buddhist diaspora, and one endorsed by Beijing and installed in Lhasa under heavy guard.
- **Divisive politics** - This division would force Buddhist communities across the Himalayan rim in Ladakh, Sikkim, Arunachal Pradesh, Nepal, and Bhutan to pick sides.
- **Reshaping of geopolitics** - If the spiritual figure (lama) sits in India, loyalty may deepen toward New Delhi.
- If seated in Lhasa, with Chinese backing and resources, the gravitational pull could shift east.
- **International boarder issues** - In Arunachal Pradesh, *China asserts its claim to Tawang*, birthplace of the 6<sup>th</sup> Dalai Lama not only through military posturing but also through spurious cultural logic.

#### What lies ahead?

- India can leverage the internal disagreements within Buddhism for building a cohesive strategy for India's and regional benefits.
- India can further the relationship with all Buddhist dominated nations for devising a collective methodology of lama succession thereby maintain the peace in Tibet region.

### 7.4 China's Dam on Brahmaputra and India's Concerns

#### Why in news?

Recently, China's construction of a massive dam on the Brahmaputra River close to the border with Arunachal Pradesh has raised concerns in India and Bangladesh.

#### What is China's project on Brahmaputra river?

- **Announced in** – 2001
- **Also known as** – **Medong county project**.
- **Location** - The dam is being built on the Yarlung Zangbo (or Tsangpo), as the Brahmaputra is known in Tibet, is being built at the **Great Bend**.
- The river Brahmaputra is called **Siang** in Arunachal Pradesh.

**Great bend** is the place where the river makes a U-turn in Medog County before entering India at Gelling in Arunachal Pradesh.



- **Electricity generation** – It will have a generation capacity of **60,000 MW**.
- **Largest ever project** – The \$167.8 billion hydropower project, which will be the world's largest after completion.
- It is three times that of the Three Gorges Dam on the Yangtze, which is currently the world's biggest hydropower station.

#### What are the concerns for India?

- **Existential threat** – This project is seen as a potential water bomb and an “*existential threat*” to tribal and their livelihoods.
- **Security threat** – It seems to be a far bigger issue than the military threat from china.
- **Risk of massive flooding** – Sudden release of water, the entire *Siang belt would be destroyed*.
- Risk due to the intentional or unintentional operation of reservoirs in Tibet.
- **Unforeseen hazards** – There are heavy chances for events such as dam failure, landslides, or earthquakes.
- **Chances of drought** – In the long run the Siang and Brahmaputra rivers could dry up considerably.
- **Seismically active region** – Tibet is located, where the Indian tectonic plate collides with the Eurasian plate, is a earthquake-prone and ecologically extremely fragile.
- **Challenges for Assam** – The Brahmaputra is the lifeline of Assam, fundamental to its economy, and central to its history, culture, and ecology.
  - Any significant disruption in the flow of the river in the state will have far -reaching consequences.
- **Future apprehensions** – China may seek to weaponise the dam project at some stage.
  - It may possibly build pressure on behalf of Pakistan after India suspended the Indus Waters Treaty against terror attack in Pahalgam.

An **existential threat** is a danger that endangers the very existence of something, whether it's a living being, a group, or an idea.

#### How did India reacted to this project?

- **Continuous monitoring** – India is observing Chinese infrastructure interventions on the river.
- **Voiced the opinion** – As a lower riparian state with established user rights to the waters of the river, India have consistently expressed the views and concerns.
- **Stressing for dialogues** – The need for transparency and consultation with downstream countries were reiterated.
- **Protecting the overall Interest** – The China has been urged to ensure that the interests of downstream states of the Brahmaputra are not harmed by activities in upstream areas.
- **China's statement** – It claims that the dam project was fully within China's sovereignty.
  - **Cooperation** – It is engaged with downstream countries on sharing hydrological data, flood prevention and disaster reduction.
  - **Communication** – It has had the necessary communication with both India and Bangladesh.
- **Unintentional benefit for India** – In the unlikely event of China reducing water flow, it may actually help India mitigate the annual floods in Assam.

#### What are the recent developments in India – China Relations?

- **Agreement on patrolling** – This was made along the Line of Actual Control, leading to disengagement and a resolution of the issues that had arisen in these areas previously.
- **Strategic talks** – The two sides exchanged views on early resumption of cross-border cooperation and exchanges, including on trans-border Rivers.
- **Recommencing of Visa** – India would resume issuing tourist visas to Chinese nationals after a gap of five years.
- **Resuming of Yatra** – The annual Kailash Mansarovar Yatra, which had been on hold for the last five years, resumed.

#### What India should do?

- **Oppose vehemently** – India needed to raise its concerns with China forcefully.
- **Capacity building** – India may make scientific calculations about the Chinese dam project, and build its own capability and capacity to prevent any deliberate actions in the future.
- **Mitigation strategy** – India could plan storage on rivers of the Brahmaputra system to absorb potential variations in flows (periods of flooding and reduced flows).

- **The Upper Siang project** – In Arunachal Pradesh, the 300-metre-high dam, is seen as important not just for its formidable hydropower potential, but also as a strategic imperative in view of the Chinese projects in Tibet.
  - The dam’s storage can serve as a buffer against variations in the flow of the river.
  - However, progress on the project has been slowed by local resistance against the potential adverse environmental impact of the dam.
- **Build more inland channels** – There is a need to build more inland channels to carry the flow of excess water in the future.

*The **National Water Development Authority** has proposed two links to connect the Brahmaputra and its tributaries to the Ganga basin with the aim of transferring surplus water to water-scarce regions.*

**What lies ahead?**

- India could seek detailed hydrological and project-related data from China in order to assess downstream impacts on a continuous basis.
- India could also have conversations with other low riparian neighbours, Bhutan, Bangladesh and even Myanmar on developing a coordinated protocol for advance warning and disaster preparedness.

**Quick facts**

River Brahmaputra
<ul style="list-style-type: none"> <li>• <b>Origin</b> – It rises in the Chemayungdung glacier in south-western Tibet.</li> <li>• <b>Left bank tributaries</b> – Lhasa, yang ,Parlung, Zangbo ,Lohit ,Dhanashri ,Kolong.</li> <li>• <b>The right bank tributaries</b> – Kameng ,Manas, Beki,Raidak,Jaldhaka,Teesta,Subansiri.</li> <li>• <b>Multiple source of water</b> – Brahmaputra is a mighty river and it is not dependent on a single source.</li> <li>• It gets most of its waters from Bhutan, Arunachal Pradesh, and the rainwater and other forms of water from Assam.</li> <li>• The Brahmaputra develops into a mighty stream only in Assam, fed by numerous tributaries and bountiful monsoon rain.</li> <li>• The Brahmaputra is not a river India depends on upstream and China contributes only ~30-35% of the Brahmaputra’s total flow – mostly through glacial melt and limited Tibetan rainfall.</li> </ul>

**7.5 Coercive Bilateralism**

**Why in News?**

*Recently, the global trade order is undergoing a deep transformation, marked by a significant shift away from multilateralism towards coercive bilateralism, spearheaded by the United States.*

**What are the various global trade orders?**

- **Global trade orders** – Global trade orders refer to the rules, norms, and institutions that govern the exchange of goods, services, and capital between countries.
- **Multilateralism** – It refers to trade negotiations or agreements *involving multiple countries*, typically under the framework of an international organization like the World Trade Organization (WTO).
- **Bilateralism** – It refers to trade negotiations or agreements conducted *between two countries or two trading blocs*.
- It highlights non-discrimination and common procedures for all members.
- **Coercive bilateralism** – It is a foreign policy approach that uses *diplomatic power, including threats of force, sanctions, or political isolation*, to compel or deter another state’s actions.

**How US is using tariff to execute Coercive bilateralism?**

- **Increase in tariffs** – United States announced a broad set of bilateral tariffs that were high and uneven.

Countries	Tariff Imposed

<b>India</b>	26 %
<b>China</b>	34%
<b>European Union</b>	20%

- **Tariff** is a tax imposed by one country on the goods and services imported from another country to influence it, raise revenues, or protect competitive advantages.
- **Working of tariffs**



- **Effects of tariffs on countries**

Tariffs can protect domestic industries	01
Tariffs can generate revenue for the government	02
Tariffs can address trade imbalances	03
Tariffs can lead to higher consumer prices	04
Tariffs can trigger retaliatory measures	05
Tariffs can disrupt global supply chains	06

**What are the consequences of coercive bilateralism?**

- **Fading of multilateralism** – The WTO, once the anchor of the global trading system, is being sidelined.
- **Growth of power asymmetry** – Smaller economies are now forced to negotiate individually with a superpower, weakening their leverage.
- **Inconsistency of global trade** – Countries are being pulled into a web of inconsistent standards, digital provisions, and tariff exceptions.
- **Future challenges** – This pattern of US approach could define global trade for a generation.
- The danger is the content of the agreements being signed under pressure and at speed.
- **Shift in global trade** – The US actions mark a deeper shift in the global trade order.
- Domestic political-economy fears about inequality, geopolitical fragmentation, and post pandemic market challenges.

### How the US trade policy shifted to coercive bilateralism?

- **Advocated for multilateralism** – In the past, US encouraged multilateralism, spearheading the General Agreement on Tariffs and Trade (GATT) and the WTO.
- It pushed for tariff reductions, rule-setting, and dispute settlement mechanisms aimed at making trade fair, transparent, and predictable.
- **Shifted to bilateralism** – Throughout the 1990s, the US gradually shifted *from multilateralism to bilateral trade agreements*.
- **Sidelining of WTO** – The US announcement marked a move away from the rules-based trade architecture of the World Trade Organization (WTO).
- **Forced negotiations** – Several countries began negotiating bilateral trade deals with the US.
- This includes advanced economies like the United Kingdom (UK) to export-dependent partners like Vietnam.
- Others, including India, are compelled to do the same, fearing that they face exclusion.
- **Aggressive policies** – The US is using its market access as a forcible instrument.
- Either countries should lower their tariffs, or US will raise their tariffs.
- **Diplomatic Dilemma** – The developing economies were compelled to either accept on sensitive sectors or face a tariff shock.
- This could weaken exports and investment inflows.
- The US is no longer trying to fix multilateralism, it is bypassing it entirely and the world is witnessing the rise of coercive bilateralism.

### How nations have reacted to the US actions?

- **Vietnam** – A deal with Vietnam that slashed the proposed 46 %, tariff on Vietnamese goods to 20 %
  - The trans-shipped goods, especially from China, would face a 40% levy.
  - **Zero tariff to US products** – Vietnam would offer zero-tariff access to US goods, including large-engine cars, though the details remain unclear.
- For US, this was a political win and a message to others which states that a deal is possible but only on Washington's terms.
- **The European Union** – It is prepared to accept a universal 10% tariff on most exports covering over €380 billion in trade.
  - It is pushing for exemptions in sectors like pharmaceuticals, semiconductors, aircraft, and alcohol.
- **UK** – Earlier agreed to a 10% tariff on cars in exchange for improved access for its beef and aircraft engine sectors.
- **China** – Negotiated limitedly, restoring some rare earth exports to the US, though core disputes remain unresolved.
- **India** – Indian officials are scrambling to resolve key differences, particularly over dairy and agricultural imports.
  - It is reportedly resisting broad concessions in these politically sensitive sectors.
  - With nearly **18.3% of Indian exports are to the US**, the risks are high.

### What lies ahead?

- A targeted agreement could be made necessary, to shield key Indian industries from sudden hikes.
- India could Revitalize regional trade pacts, expand South-South coalition, and contribute to WTO reform.
- Beyond the bilateral equation, India could also act multilaterally.
- Above all the nations could recommit to rebuilding a fair, rules-based system.

## 8. ECONOMY

## 8.1 India Economic Performance 2024-25

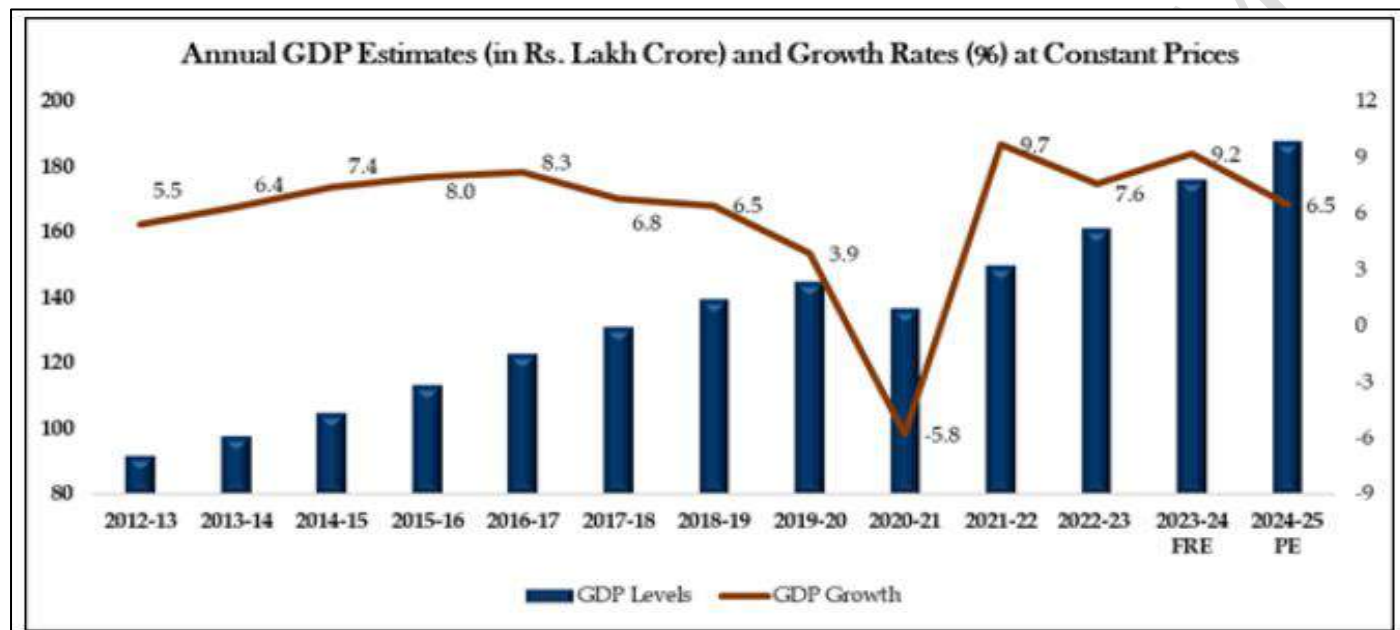
### Why in the News?

Recently, provisional estimates of annual gross domestic product for 2024-25 was released.

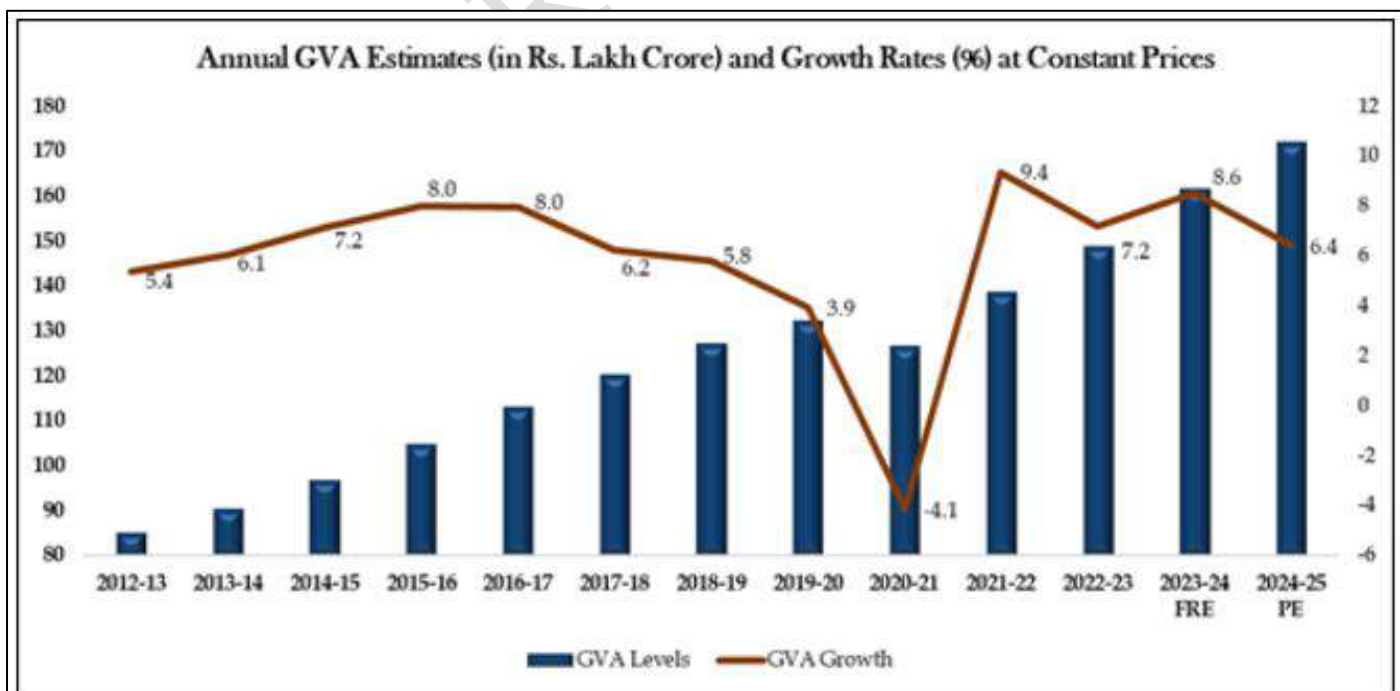
### What was the economic performance of India in 2024-25?

The National Statistics Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI) releases the Provisional Estimates (PE) of Annual Gross Domestic Product (GDP) for the Financial Year (FY) 2024-25.

- **Real GDP Growth** - GDP at Constant Prices is estimated to attain a level of Rs. 187.97 lakh crore in FY 2024-25 registering a growth rate of 6.5%.
- **Nominal GDP Growth** – GDP at Current Prices is estimated to attain a level of Rs. 330.68 lakh crore in the FY 2024-25, against Rs. 301.23 lakh crore in FY 2023-24, showing a growth rate of 9.8%.

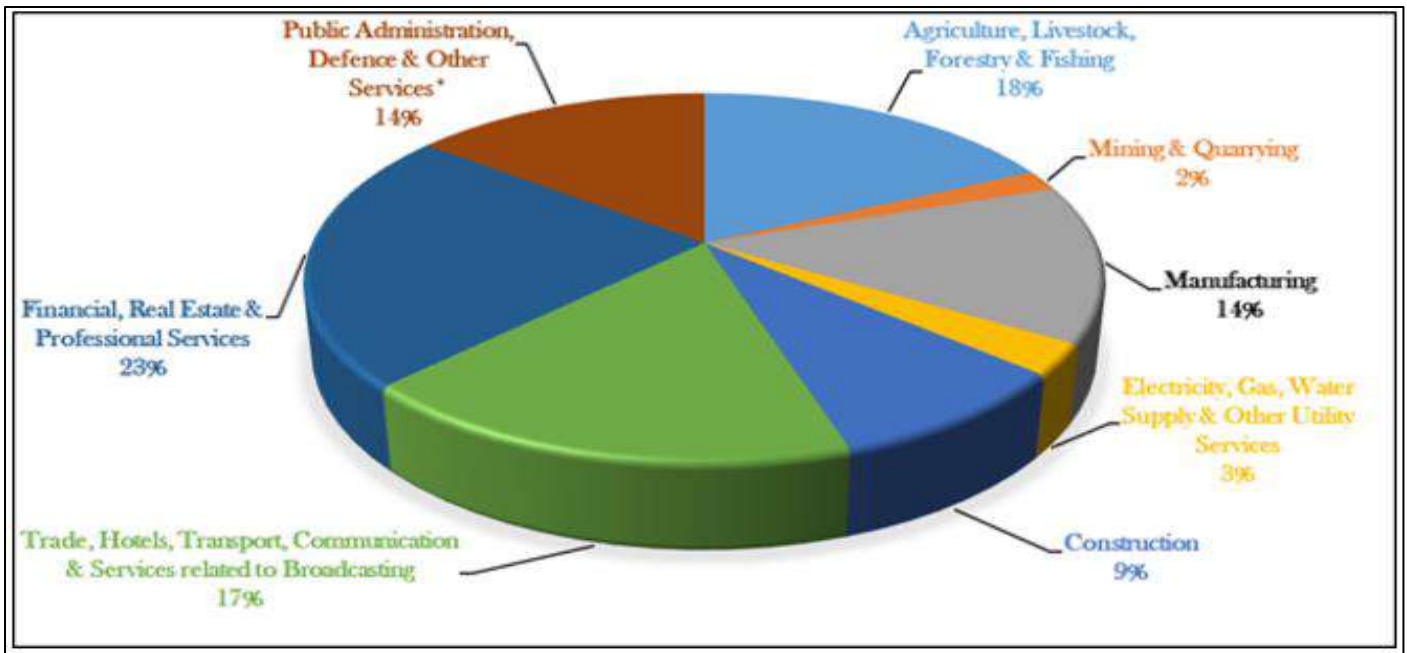


- **Real GVA Growth** – It is estimated at Rs. 171.87 lakh crore in the FY 2024-25, registering a growth rate of 6.4%.

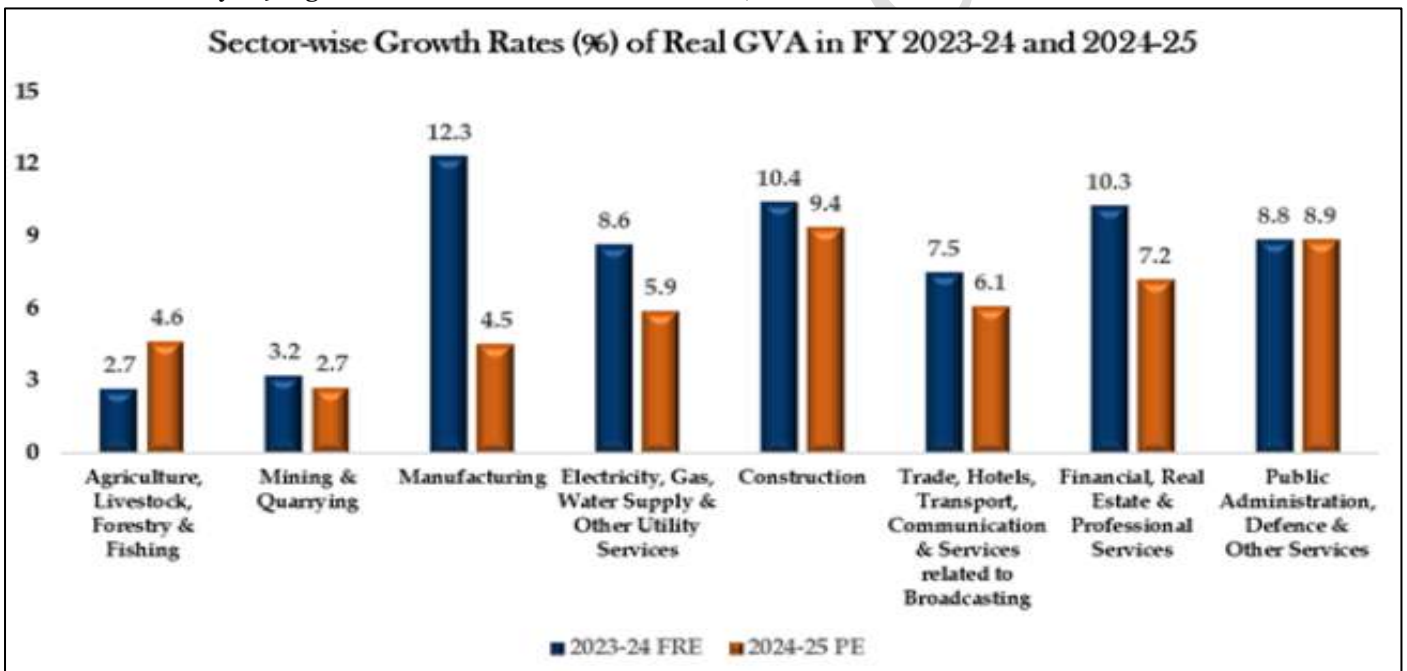


- **Last Quarter Growth** - In Q4 of FY 2024-25, Real GDP and Nominal GDP has been estimated to grow by 7.4% and 10.8% respectively.

- **Sectoral Composition of GVA** – Financial , Real Estates & Professional Services accounts for 23% of Nominal GVA in FY 2024-25.



- **Sector-wise Estimate** - ‘Construction’ sector is estimated to record a growth rate of 9.4% in FY 2024-25, followed by 8.9% growth rate in ‘Public Administration, Defence & Other Services’ sector.



- **Growth of Primary Sector** - Primary Sector has seen 4.4% growth rate as compared to growth rate of 2.7% observed in previous financial year.

**Primary Sector:** Agriculture, Livestock, Forestry & Fishing and Mining & Quarrying  
**Secondary Sector:** Manufacturing, Electricity, Gas, Water supply & Other Utility Services and Construction  
**Tertiary Sector:** Trade, Hotels, Transport, Communication and Services related to Broadcasting, Financial, Real Estate & Professional Services and Public Administration, Defence & Other Services.

- **PFCE Growth** - Private Final Consumption Expenditure (PFCE) has reported 7.2% growth rate during FY 2024-25 as compared to 5.6% growth rate in the previous financial year.
- **GFCF Expansion** - Gross Fixed Capital Formation (GFCF) has a measure of asset creation by the public and private sector, saw growth slowing to 7.1% in 2024-25 from 8.8% in 2023-24.

**What is the takeaway from the provisional estimate report?**

- **Slow but Comparatively Better Growth** - The 6.5% growth in 2024-25, the slowest since the pandemic but the fastest among major economies.
- In a growth-scarce environment, post-COVID and despite the rising uncertainties due to political conflicts and trade tensions, India is holding up its growth numbers better than many advanced economies.
- **Robust Growth in Fourth Quarter** – The real GDP growth in Q4 of 2024-25 accelerated to 7.4%, the fastest quarterly growth in the year.
- But it was slower than the 8.4% seen in the fourth quarter of the previous financial year.
- **Main Drivers of Growth** - The construction sector returned to double-digit growth, and the agriculture sector posted a strong performance and these are also two major employment drivers.
- **Decline in Manufacturing** - The manufacturing sector grew at just 4.8%, down from 11.3% in Q4 of the previous year.
- **Major Role of Taxes** - The GDP growth rate of 7.4% was achieved in large part due to a 12.7% growth in net taxes.
- This bump in tax collections provided a statistical boost without which growth in actual economic activity would have come in at around 6.8%.

Sl. No.	Indicators	2023-24	2024-25	Q4 2023-24	Q4 2024-25
[1]	[2]	[3]	[4]	[3]	[4]
1	Production of Rice	4.0	6.3	-2.7	12.1
2	Production of Coal	11.8	5.1	10.2	2.6
3	Production of Crude Oil	0.6	-2.2	3.3	-2.7
4	Production of Cement	8.9	6.3	7.6	12.3
5	Consumption of Steel	13.7	11.5	10.6	11.9
6	Total Telephone Subscribers	2.3	0.1		
7	Sales of Commercial Vehicles	0.7	-1.2	-3.6	1.5
8	Purchase of Private Vehicles	12.4	7.7	22.0	1.6
9	Cargo Handled at Major Sea Ports	4.5	4.2	2.8	8.7
10	Cargo Handled at Airports	7.0	10.5	19.1	2.1
11	Passengers Handled at Airports	15.0	9.4	7.3	11.3
12	<b>Railways</b>				
	(i) Net Tonne Kilometres	1.1	-0.01	4.2	-2.6
	(ii) Passenger Kilometres	11.0	6.0	5.3	6.6
13	Aggregate Bank Deposits	12.9	10.6		
14	Aggregate Bank Credits	16.3	12.1		
15	Revenue Expenditure less Interest Payment and Subsidies (Centre)	3.3	3.9	-1.1	-3.0
16	Export of Goods & Services	3.2	8.3	5.6	8.0
17	Import of Goods & Services	-1.3	9.5	3.3	6.3
18	CPI General Index	5.4	4.6	5.0	3.7
19	<b>IIP</b>				
	(i) Mining	7.5	3.0	4.9	2.4
	(ii) Manufacturing	5.5	4.1	4.8	4.2
	(iii) Electricity	7.1	5.2	7.3	4.6
	(iv) Metallic Minerals	6.5	4.2	-3.1	6.9
20	<b>WPI</b>				
	(i) Food Articles	6.6	7.3	7.0	3.6
	(ii) Minerals	6.9	4.5	4.4	1.9
	(iii) Manufactured Products	-1.7	1.7	-1.1	2.9
	(iv) All Commodities	-0.7	2.3	0.3	2.3

#### What lies ahead?

- To keep pace with the country's growing requirements and achieve a 'Viksit Bharat' by 2047, the growth must be held to a higher standard in line with its aspirations.
- As the Economic Survey points out, Viksit Bharat by 2047 requires "sustained economic growth of close to 8% every year for at least a decade.

## 8.2 RBI's Project Financing Guidelines

### Why in news?

Recently, RBI (Reserve Bank of India) changed its project financing rules.

### What are the stages of a project?

- In the context of RBI's project financing, a project goes through three phases, namely, the design phase, the construction phase, and the operational phase.
- Design phase – This typically includes planning and conceptualization which includes preparing a project proposal, then reviewing its potential risk analysis, identifying the potential lenders.
- Construction phase – It involves execution and building of the plan and so the project do not generate any revenue in this phase.
- Loan disbursement occur in a phased manner throughout the phase by means of mobilizing resources, delays, unforeseen expenditure, supply shortages.
- Operational phase – Once after completing phase 2, it starts to operate and generate revenue by means of production.

### What are the RBI's guidelines?

- **Provisioning Requirement** - The Reserve Bank of India's (RBI's) recent project financing guidelines have emphasized that the provisioning requirement on project finance is now 1 %, instead of 5 % proposed earlier.  
*Provisioning requirement means capital that kept by the banks to deal with the future risks against loans.*
- **Land and Right of Way Requirement** - A lender shall ensure availability of sufficient land/right of way for all projects before disbursement of funds, subject to following requirements
  - For infrastructure projects under PPP model – 50%
  - For all other projects (non-PPP infrastructure, and non-infrastructure including CRE & CRE-RH) – 75%
  - For transmission line projects – as decided by a lender.  
*Right of way is a legal right to use another person's land for a specific purpose, like a road or*
- **DCCO Deferment Limits** - Permitted DCCO deferment limits under the guidelines are
  - **For infrastructural projects** – Covering 3years from original DCCO.
  - **For non-infrastructural projects** – upto 2 years.
- Cost overruns up to 10% due to DCCO extensions as stated above may be funded by lenders through pre-approved Standby Credit Facilities (SBCF).

### What is DCCO?

- **DCCO** - It means Date of Commencement of Commercial Operations, is the target date for operations.
- DCCO can be delayed because of any unforeseen situations like supply shortages like lack of raw material for the production.
  - For example - if China and India is in war, if the supply of rare earth minerals export is paused for India by China, leads to delay project functioning.

### What are potential benefits of the updated norms?

- Increases in Capital Availability - New guidelines eased the risk of excess absorption of capital and avoided slowdown in the economic activity.
- Maximizes loan recovery chances - As projects can gather required resources, they generate more profits and repays loan to banks fully.
- Avoids premature liquidation - Provides a lucrative opportunity for the projects and avoiding premature liquidation.
- Boosts employment and economic growth - By increasing production, these reforms facilitate economic growth, income and overall demand in economy.

### Why blanket extension of DCCO is disruptive?

- Even it seems compassionate and helpful blanket extension of the DCCO is considered disruptive for the several reasons.
- **Advocate Mismanagement** – Delays due to poor leadership and corruption leads to further reduction in performance.
- **Increase in Asset Devaluation risks** – Blanket extensions will prevent opportunity costs of liquidation of assets, which can function very well individually.
- **Capital depreciation** – A power plant delayed for years might see its *machinery depreciate* or become outdated by the time it starts operations.
- **Distorts healthy competition** – Projects with serious issues would be getting unfair advantages over projects that are timely and well-managed.
- In some cases, borrowers may even steal assets pledged to the banks. Even social welfare is likely to be enhanced if the assets are passed on to a more efficient user of capital through bankruptcy or liquidation proceedings.

#### What are challenges associated with new rules?

- **Create volatility** - In the long run excess credit availability may create volatility in the project functioning, if poorly managed.
- **Asset quality deterioration** - If project delays, cost increases, early stress fall on asset's functioning, leads to asset quality reduction.
- **Loan Default** - Failure meeting loan repayment obligations on time by the borrowers.
- **Risk of NPA Classification** - Delayed projects will be classified as NPA (Non-Performing assets) by the banks.
- **Affects Banks Financial Position** - Banks will be left with reduced capital for the new lending.
- **Reduction in investor confidence** - Due to delay in functioning and generating profits, investors may be hesitant to invest in the projects.

#### What lies ahead?

- Lenders can be asked to have a board-approved policy of identifying liquidity shocks and establish a process where the DCCO may be extended only when they are convinced that the delay is due to such shocks.
- RBI in its part, may review lender policy, make it advantageous to the best users of the capital to maximize production and employment.
- Banks can be linked with real-time project managing dashboards by using drone technology and timely updates of the projects.
- With involving multi stakeholders, quick Licensing and project approvals can be ensured at every stage to avoid in delays.

### 8.3 Decarbonising Shipping Industry

#### Why in the news?

The recent developments shows that global shipping is on course towards decarbonisation by 2024-50 by means of using green fuels.

#### What are the green fuels?

- **Green Fuels** – These are energy sources derived from renewable resources, designed to minimize environmental impact compared to traditional fossil fuels.

Green Fuel Type	Production
Green hydrogen	It is made by electrolysis of water powered by renewable energy.
Green ammonia	It is produced by combining green hydrogen with nitrogen using renewable energy.
Green methanol	It is synthesized from green hydrogen and captured carbon dioxide.

- **Advantages** – It reduces greenhouse gas emissions, improves air quality, and enhances energy independence.

### What are the green fuels used in shipping?

- **Existing fuels** – Merchant ships largely use Very Low Sulphur Fuel Oil (VLSFO), diesel, and methane gas stored in liquid form as fuel.
- **Transition fuel** - LNG-powered engines with their higher efficiency of some 5% are likely to be a transition fuel before shipping moves to green fuels.
- **Initial preferences of green fuel** – It is **green methanol** due to easier engine and storage adaptation and it emits some 10% of carbon dioxide only.
- It is almost drop-in replacement for VLSFO and can be stored as a liquid at ambient temperature.
- Already, more than 360 ships capable of operating on methanol are either in service or in order.
- **Future preference** - **Green ammonia** is favored in long-term as it does not emit greenhouse gases during combustion.
- But requires significant onboard handling adjustments.
- **Rejected fuel** - Shipping will not use green hydrogen directly because of issues with storage and transportation of hydrogen, a highly volatile fuel.

### What are shipping decarbonization plans in India?

- Transitioning to green hydrogen, methanol, and ammonia reduces shipping's carbon footprint, directly contributing to national targets—such as India's net-zero by 2070 pledge.
- **Green fuel potential** - India has the land and expertise for solar power to be a major supplier of green fuels to global shipping.
- India's aggressive push in creating 1.5 GW of local electrolyser manufacturing capacity and growing industrial CO<sub>2</sub> sources (from steel and cement industries) positions India strategically to develop integrated green fuel hubs.
- **Green Fuel Hubs** - Development of green hydrogen hubs and green fuel bunkering stations at key ports like Kandla, Paradip, and Tuticorin support supply and export of sustainable marine fuels.
- **Export green fuels** – The efforts are underway in producing and supplying green fuels to Singapore.
  - **Singapore is a fuelling station** accounting for nearly one-fourth of all global ship fuelling.
- **Challenges** - Solar panels and electrolyzers to make green hydrogen need to be imported.

### What are the implementation challenges?

- **Technology dependence** - Electrolyzers and some key equipment still need to be imported, increasing capital costs.
- **Pricing discrepancy** - Green fuel production is significantly more expensive than conventional fuels, driven by the cost of renewables and CAPEX (Capital Expenditure) for production facilities.
- A 100% sustainable e-methanol as bunker fuel costs USD 1,950 per tonne (of VLSFO equivalent) in February, 2025 in Singapore, while VLSFO averaged at USD560 per tonne.
- **Lack of regulations** - Absence of standardized regulatory frameworks.
- **Supply Chains** - Scaling up renewable energy and domestic electrolyser manufacturing remains a bottleneck.
- **How India can become a marine green fuel production hub?**
- **Sovereign guarantees** – They have emerged as a powerful de-risking mechanism for green methanol investments that can considerably reduce prices.
- These **government-backed assurances** can fundamentally transform project economics by enabling access to international capital markets at significantly lower interest rates.
- **Production-linked incentive (PLI) schemes for electrolyzers** – It can relieve supply chain bottlenecks by territorialising value chains and lessening transportation costs of raw materials.
- **Carbon capture, utilisation, and storage (CCUS) incentives** – They can increase the feasibility of the production of green methanol from sequestered CO<sub>2</sub>.
- **Leveraging Multilateral development bank funds** - They offer financing at rates as low as 4%, as opposed to 11-12% by domestic lenders.

### What lies ahead?

- Governmental incentives and foreign partnerships (with Korea, Japan) can attract global shipbuilders and stimulate economies of scale.
- Integrated green fuel hubs and supportive policy frameworks can position India to revitalize its shipowning and shipbuilding industries while meeting decarbonisation targets.

## 8.4 Role of Youth in Agrifood Systems

### Why in the news?

Recently, the Food and Agriculture Organization (FAO) has released “The Status of Youth in Agrifood Systems”, which emphasizing the crucial role of youth in transforming agrifood systems.

### What is the current status of youth in agrifood systems?

- **Youth** – According to the Food and Agriculture Organization (FAO), youth are generally defined as individuals between the ages of 15 and 24.
- **Agrifood systems** – Agrifood systems encompass all the activities involved in producing, processing, distributing, and consuming food, as well as the associated socio-economic and environmental factors.



- **Need** – Youth aged 15 to 24 constitute 1.3 billion individuals with nearly 85% living in low and lower-middle-income countries globally have agrifood systems as livelihood options.
- Food insecurity has risen from 16.7 % to 24.4 % between 2014-16 and 2021-23 among youth, especially affecting young people in Africa.
  - Report notes that over 20 % of youth are not in employment, education, or training (NEET), with young women twice as likely to fall into this category.
- **Share of youth in agrifood** – The share of working youth in agrifood systems has decreased from 54 % in 2005 to 44 % in 2021.
- Rural youth account for only 5 % of the population in industrial agrifood systems, signaling potential labor shortages if agricultural careers are not made more attractive.
- Globally, 44 % of working youth rely on agrifood systems for employment compared to 38 % for working adults.

### What are the challenges in youth participation?

- **Landlessness** – Fragmented landholdings or no landholdings encourage youth to choose different career paths, which are comparatively more productive.
- **Social status** – Agriculture profession is discriminated in society i.e. if someone do agriculture, their social status often linked to lower status.
- **Internal migration** – In search of better livelihood chances youth prefer migrating to urban areas, which provides multiple opportunities.
  - **Youth demographics** – It indicating that 54 % live in urban areas, with the highest concentrations in eastern Asia.

- **Lack of access to information** - These challenges were mostly related to access factors such as production resources, finance, knowledge and information, extension, innovation, and technology.
- **Lack of human capital** - Lack of education, career guidance, employable skills to enter the job market, mentorship challenges linked to requiring human capital.
- **Lack of financial capital** – Access to finance and credit and rising input costs are challenges together associated bringing initial investment in agriculture.

### How youth can be encouraged?

- **Awareness on modern agriculture** - Necessary awareness on agriculture business (modern methods of crop/animal production, input and service provisioning institutions) through experiential learning has to be created.
- **Youth targeted schemes** – Ensuring access to training, land, and credit through youth-targeted schemes enhances their ability to catch up.
  - **For example** - ATMA Cafeteria subsumed under ATMA (Agriculture Technology Management Agency) provides skill training courses of at least 200 hours to rural youth and farmers
- **Converting agri-farmers to “agripreneurs”** - Youth-specific initiatives facilitating unhindered access to financial services and prioritising aspiring young men and women is equally important.
- **Developing a market** - Elimination of existing barriers via real-time transfer of information to support products, markets and consumer demands by infusing the state-of-the-art ICT tools would be crucial.
- **Value adding processing** - Value addition to agricultural produce by primary processing (cleaning, grading, packing whole or packing ready to cook normal or freeze-dried cuts) is known to cause an additional surge in income and employment.
- **Policy intervention and institutionalization** - Comprehensive backing of public policymaking bodies NITI Aayog and Ministry of Agriculture in that the core concerns of youth are addressed effectively.
  - **For example** - “Sun-rise agriculture enterprise” is a potent strategy to attract and sustain the youth in agriculture and to generate new jobs.

### What are the measures taken in India?

- **Agri-Clinics and Agri-Business Centres Scheme** – Government introduced in April 2002 focuses on training and subsidy.
  - National Institute of Agricultural Extension Management, provides training to agricultural graduates to help them establish business units under agricultural allied activities.
  - Trained candidates establishing agri-ventures availing credit facilities are extended with subsidy depending on certain factors.
- **Skill Training of Rural Youth (STRY)** – It provides rural youth with skill-based training in agricultural and related fields to increase rural employment for both farm and non-farm tasks.
  - The training to rural youths shall be imparted through any identified training institutions at state / district level.
- **Sub Mission on Agricultural Mechanization (SMAM)** -Government releases funds for farm mechanization like establishment of custom hiring centers, farm machinery bank and high-tech hubs to different states.
- **Rashtriya Krishi Vikas Yojana (RKVY-RAFTAAR)** – Remunerative Approaches for Agriculture and Allied Sectors Rejuvenation.
  - It is aimed at strengthening infrastructure in agriculture and allied sectors by building agripreneurship & agri-business ecosystem in the country.
- **Certified Farm Advisor/Certified Livestock Advisor programme** – It develops agricultural extension personnel into specialists in a particular crop / livestock.
- **Skill Development Programmes** – It involves providing employable skills to the youth through short term and long-term program on pan India basis both in rural and urban areas.
- **Project ARYA (Attracting and Retaining Youth in Agriculture)** – Its goal is to engage and empower rural youth in various agricultural and related economic activities.

### What are the benefits of youth inclusion?

- **Innovation and climate adaptation** – Young people bring energy, creativity, and a willingness to experiment with new technologies and act better in climate adaptation.
- **Economic potential** – Many rural youths reside in areas with high agricultural productivity potential, presenting significant investment opportunities in market access and infrastructure.
- **Prevent labor shortages** – Youth inclusion is essential to replace retiring farmers and prevent labor shortages, especially in adapting to climate.
- **Flexible in technology adaption** – Young people generally more adapt with digital tools and technologies, which are critical in modern agriculture.
  - **For example**, adaption of digital apps, weather alert systems etc.
- **Resilience and Social Networks** – Youth social networking abilities help disseminate information quickly and mobilize communities for collective action.

#### What lies ahead?

- Youth engagement in agrifood systems can be possible with continued investment in data and research to inform youth-targeted policies.
- Expanding digital access and literacy will keep youth connected to technologies and further help for agrifood transformation.
- Flexible career switch mechanisms can be developed, to retain youth in agrifood systems.

### 8.5 Prospect of Energy Exploration at Andaman

#### Why in news?

Recently the Union Minister for Petroleum Hardeep Singh Puri said that it is a “matter of time” before a Guyana-like oil basin is discovered in the Andaman Sea.

#### Why is Andaman Nicobar basin significant for oil exploration?

- **Gas and Condensate Availability** - The region is a string of gas and condensate discoveries in the adjacent basins along North Sumatra (Indonesia) and Irrawaddy-Margui (Myanmar).
- **Hydrocarbon Reserves** – The region has Excellent potential for large hydrocarbon accumulations.
- **Unexplored Regions** - The Andaman Basin, comprised of a major chunk of unapprised (unexplored) area of the offshore sedimentary basins of India.
- **Presence of Oil and Gas** - mud volcanoes bearing indications of the presence of oil and gas from the outcrops of the Baratang formations of the Middle and South Andaman.

#### Andaman and Nicobar Islands

- **Formation** - Andaman and Nicobar Islands were formed due to collision between Indian Plate and Burma Minor Plate
- **Three main islands** - The Andaman Islands are divided into three main islands i.e. North, Middle, and South.
- **Ten Degree Channel** - The Great Andaman group of islands in the north is separated by the Ten Degree Channel from the Nicobar group
- **Duncan passage** – It separates Little Andaman from South Andaman.

#### What aids the exploration of the survey?

- **Deep Andaman Offshore Survey** – The Andaman Basin, measuring 2.25 lakh square kilometre comprised of a major chunk of sedimentary basins of India.
- **National Data Repository in 2023** – It is an integrated data repository of Exploration & Production data of the Indian sedimentary basins.
- **Hydrocarbon Exploration and Licensing Policy (HELP)** – This policy provided the real fillip in intensifying investment and exploration activity in the basin.
- **Open Acreages Licensing Policy (OALP)** – Through this Oil companies can select blocks of their choice.
- **Uniform Licensing Network** – The HELP covers all hydrocarbons (i.e. Conventional and Unconventional hydrocarbons) under a single licensing framework.

#### What are the challenges involved in exploration?

- **Higher Investments** - The inter-connected production and processing sites are more expensive to build than onshore shale.
- **Price fluctuation** - Fluctuating prices of oil might contribute unfavourably to the ambitions in the Andaman Nicobar basin.
- **Delay in commercialization** - After exploring a basin commercial production take several years to successfully happen.
- **Operational costs** - Offshore oil and natural gas production is much more expensive than onshore, or land-based productions.
- **Lack of data** - The report by the Standing Committee on Petroleum and Natural Gas reveal the data about the wells in the basin was scanty with data coverage being moderate to sparse.
- **'No-Go' zone** - The area was not thoroughly explored because most was barred from drilling and production is banned.

#### What lies ahead?

- The change in approach, alongside a bigger Guyana-like discovery could help Indian economy scale up from being a \$5-7 trillion economy to a \$20 trillion economy.
- It is of immense importance to explore new energy options to ensure energy security of India.

### 8.6 Jane Street's F&O Trading Manipulation

#### Why in the news?

Recently, Securities and Exchange Board of India (SEBI) has banned Jane Street Capital for alleged market manipulation to make major illicit gains that it took out of the country mostly in F&O trading.

#### What is F&O trading?

- **F&O trading** - Futures and options are financial derivatives that allow **traders to speculate on the price movements** of an underlying asset without owning it.
- **Futures** – They are contracts that legally bind holders to buy or sell a certain asset at an agreed-upon price at some time in the future, regardless of what the price is then.
- Thus, this benefits buyers when the price has increased and sellers when it has decreased (compared to the predetermined price).
- **Options** – They are contracts that give buyers the right (not an obligation) to purchase an asset from a willing seller at some time in the future.
- To ensure fairness, buyers are required to pay the seller a premium right after signing.
- **Two types of options** - Call options and put options.
  - **Call options** – It give holders the ability to buy the asset at the predetermined price.
  - **Put options** - It allow the holders to sell the asset at the predetermined price.
- **Issues with F&O** – It is one of the riskiest trading choices a retail investor can make.
  - According to SEBI, more than 9 out of 10 retail investors in India have lost money in FY25 trading on F&Os.
- **Ways to minimize risk** - It is possible to minimize these risks by understanding ways to optimally use F&O trading.
- This can be done potentially in terms of limiting capital expended, enhancing risk tolerance, and more.

**Derivatives** are financial contracts whose value is linked to the value of an underlying asset. They are used for various purposes, including speculation, hedging, and getting access to additional assets or markets.

#### What is Jane Street accused of doing?

- **Jane Street** - Jane Street (JS) is a global trading firm based in the New York that uses data-driven, automated models to trade across global markets.
- **Issue** – On January 17, 2025 it took home a whopping Rs 735 crore in a single day by allegedly implementing algorithms that allowed them to manipulate NIFTY and Bank NIFTY index prices.

**National Stock Exchange Fifty (NIFTY)** is an index representing the top 50 companies listed on the National Stock Exchange (NSE) of India.

- They made unlawful net profits of more than Rs 36,500 crore, between January 2023 and March 2025.
- **Impacts** – Their alleged market manipulation led to massive losses for retail investors while Jane Street made whopping profits.
- **Action taken by SEBI** – SEBI prohibited Jane Street from trading in the Indian markets.
- It ordered banks to freeze more than Rs 4,800 crore deposited by Jane Street in their accounts.
- While Jane Street refuted the allegation, it has deposited more than Rs 4,800 crore in an escrow account, in compliance with the requirements of the interim order passed by SEBI.

An **escrow account** is a temporary, secure holding place for funds or assets during a transaction, managed by a neutral third party, until certain conditions are met.

### How Jane Street allegedly dodged SEBI regulations?

- Jane Street relied on several factors to pull off its alleged illegal “operation” in the Indian market.
- **Regulation** - In 2019, SEBI notified a ‘Foreign Portfolio Investors’ regulation whereby, a foreign portfolio investor shall transact in the securities in India only on the basis of taking and giving delivery of securities purchased or sold. This rule blocks intraday trading for foreign firms.
- **Created Indian Subsidiaries** – They created multiple Indian subsidiaries to bypass “Foreign Portfolio Investors” regulation.
- Thus, Jane Street’s Indian subsidiaries were technically allowed to indulge in intraday stock trading, “pumping and dumping” prices for their convenience.
- **Intra-day index manipulation** - It would rapidly buy major banking stocks that were components of the “Bank NIFTY” index that would artificially drive the price of the index up.
- Thousands of retail investors would jump on this false rise, buying call options and selling puts while Jane Street would be buying put options and selling calls.
- **Expiry day manipulation** - On contract expiry days, it would dump its index futures and holdings, resulting in a sudden decline of the share price.
- **Malicious algorithm** – Jane Street’s algorithms were able to make multiple targeted trades in the derivative market within milliseconds of executing.



**Intraday trading** refers to buying or selling of stocks on the same day, all before the market closes.

### What lies ahead?

- Continuous monitoring and improving market intelligence can be done to strengthen market regulations.
- Creating a unified financial regulator could help to tackle jurisdictional overlaps and mismanagements.

## 8.7 National cooperative Policy 2025

### Why in news?

Recently, Union Home and Cooperation Minister unveiled the National Cooperation Policy 2025, replacing 2002 framework, aiming to connect 50 crore people with the cooperative sector.

### What is need for new National Cooperative Policy?

- Cooperation can be a vital instrument for the country’s development for future generations.
- **Insufficiency of inclusive development** – With the increased population to 130 crore people, there is a need to revamp cooperative sector to suit the current demographic needs.

- **Outdated frameworks** – Transformation occurred in the society, country and abroad in the last 20 years due to globalization and technological innovation require holistic approach.
- It became necessary for a new policy so that cooperative institutions can be made more active and useful in the current economic scenario.
- **Declining cooperative movement** – There are 3 key factors contributing to decline of cooperative movement in India that are
  - Outdated laws that remained unchanged
  - Lack of evolution and expansion in cooperative activities
  - Recruitment practices influenced by favoritism.

*The number of **cooperative societies in India** are more than 8 lakh and is currently home to more than one-fourth of the world's cooperatives. With about one-third of India's rural population directly connected to them as members for their diverse socio-economic needs.*

### What is National Cooperative Policy 2025?

- It is drafted by a 48-member national-level committee with 16 objectives.
- **Objectives** – It aims *to bring in at least 50 crore people* under the ambit of cooperatives and make them stakeholders in the equitable growth.
- It aims to *triple the cooperative sector's contribution to GDP* by 2034.
- It aims to strengthen the cooperative movement at the grassroot levels
- **Target** - It is to have *at least one cooperative organization in every village* in India.
- **Core focus** – *Dalits, Adivasis and women* are at the core of the new cooperative policy.
- **6 pillars** – It is to achieve the set goals for the cooperative sector
  - Strengthening the foundation
  - Promoting vibrancy
  - Preparing cooperative societies for the future
  - Enhancing inclusivity and expanding reach
  - Expanding into new sectors
  - Preparing the younger generation for cooperative development

*Union minister laid foundation for **Tribhuvan Cooperative University** to prepare professional and trained manpower to meet the growing needs of the cooperative sector.*

To know more about Tribhuvan Cooperative University, click [here](#)

- **Policy implementation** – A national-level committee for will be established for central-state coordination, troubleshooting implementation bottlenecks, periodic monitoring and evaluation.
- **Monitoring** - 'National Steering Committee on Cooperation Policy', chaired by Union minister of cooperation, will be constituted for overall guidance, inter-ministerial coordination, periodic policy review, etc.

### What are its benefits?

- **Strong framework** – Legal, economic, and institutional framework will be strengthened and can *deepen the cooperative movement at the grassroots level*.
- **Grassroot level cooperative movement** – 5 model cooperative villages in every 'tehsil' will be developed.
- Other villages in the district will be prodded and encouraged to first catch up with the model village, and subsequently aspire to become one of the best in the state.
- **Cooperative business ecosystem** – A detailed plan for sectors like tourism, taxi services, insurance, and green energy will be established.
- **Benefiting targets** - The profits generated through these units will ultimately reach the members of Primary Agricultural Credit Societies (PACS) at the rural level.
- **Capital generation** – Cooperatives has a unique capability to pool small amounts of capital from many individuals to create large-scale enterprises.
- Emphasizing that only the cooperative sector has the capacity to develop the nation's economy inclusively with contributions from all 1.4 billion citizens.

- **Encourage independent policies** – Bringing up cooperative banks under the Banking Act and the Reserve Bank of India has solved many of the problems and support formulating state specific policies.

### What lies ahead?

- Building a large and robust cooperative ecosystem can firmly establish the belief that cooperation can be a vital instrument for the country's development for future generations.
- The role of the cooperative sector can be strengthened in achieving the goal of 'Viksit Bharat 2047'.

## AGRICULTURE

### 8.8 Dhan-Dhaanya Krishi Yojana

#### Why in news?

Recently, the Union Cabinet approved the Prime Minister Dhan-Dhaanya Krishi Yojana (PMDDKY) which was announced in 2025-26 Union budget.

#### What is Dhan-Dhaanya Krishi Yojana?

- It is a scheme to **develop 100 agricultural districts**.
- **Launched by** – Ministry of Agriculture & Farmers Welfare.
- **Basis** – It is designed on the lines of the Aspirational Districts Programme (ADP).
- **Objectives** – Enhancing agricultural productivity.
  - Adopting crop diversification and sustainable agriculture practices
  - Augmenting post-harvest storage at the panchayat and block level
  - Improving irrigation facilities
  - Facilitating availability of long-term and short-term credit.
- **Beneficiaries** – 100 districts with low productivity, moderate crop intensity and below-average credit parameters.
- **Budget** – Rs.24,000 crore per year.
- **Implementation period** – 6 years, beginning with the financial year, 2025-26.
- **Guidance and capacity building support by** – NITI Aayog

#### How it will be implemented?

- **Implementation** – It will be implemented through the convergence of 36 existing schemes across 11 Departments, other State schemes, and local partnerships with the private sector.
- **Identification of 100 districts** - It will be based on 3 key indicators
  - Low productivity, Low cropping intensity and Less credit disbursement
- The number of districts in each State/Union Territory will be based on the share of Net Cropped Area and operational holdings.
- However, a minimum of 1 district will be selected from each State.
- **Implementation arm** – Committees will be formed at district, State and national levels for effective planning, implementation and monitoring of the scheme.
- **A master plan** - This will include agriculture and allied activities which will be drawn up for every district.
- **Technical knowledge partners** – Central and state agriculture universities.

#### District Agriculture and Allied Activities Plan

- **Prepared by** - District Dhan Dhaanya Samiti headed by the Collector.
- **Members** – Progressive farmers.
- **Plan details** - Crop diversification
- Conservation of water and soil health
- Self-sufficiency in agriculture and allied sectors
- Expansion of natural and organic farming

- **Monitoring** – The progress of the scheme in each Dhan-Dhaanya district will be monitored on a monthly basis on 117 Key Performance Indicators.
- A portal/ dashboard will be developed for this purpose.
  - Central Nodal Officers (CNOs) will be appointed for field visits, review and monitoring.
- **Ranking districts** – It is based on their performance.

#### What are the expected outcomes?

- **Higher agricultural productivity** – It can help in achieving higher agricultural productivity and also can enhance value addition in agriculture and allied sectors.
- **Local livelihood creation** – It can create sustainable employment and income opportunities within communities.
- **Achieve self-reliance** – It will increase domestic production with local manufacturing, innovation and resource utilization.
- **Growth of national indicators** - As the indicators of these 100 districts improve, the national indicators will automatically show an upward trajectory

#### What lies ahead?

- **Resilient farming** - should not be dependent on credit, instead expand and diversify income streams for farmers via allied and value-added activities.
- **Build capacity and awareness** – provide training and awareness programme for farmers.
- **Build private – public partnership**– foster collaboration with start-up, private sector and research institution for innovation.

#### Quick Facts

- **Cropping intensity** – It is defined as the % of gross cropped area to the net area sown.
- Simply put, it means the number of crops grown on a piece of land in an agricultural year (July-June).
- At the all-India level, it was recorded at 155 % in 2021-22, but there were variations across states.
- It is a measure of how efficiently land is used.

#### Aspirational Districts Programme (ADP)

- **Launched in** – 2018.
- **Target** – India's 112 most underdeveloped districts,
- **Aim** – To transform the districts quickly and effectively.
- **Implementation and monitoring by** - NITI Aayog
- **Working** – It is based on the 3 Cs,
  - Convergence of central and state schemes
  - Collaboration of central and state level nodal officers and District Collectors
  - Competition among districts through monthly delta ranking based on incremental progress in 49 Key Performance Indicators (KPIs) under 5 socio – economic themes.
- **5 broad socio-economic themes**
  - Health & Nutrition,
  - Education,
  - Agriculture & Water Resources,
  - Financial Inclusion & Skill Development, and
  - Infrastructure.

## INDUSTRIES, INFRASTRUCTURE & INVESTMENTS

### 8.9 Sustainable Aviation Fuel (SAF)

#### Why in news?

Recently, IATA (International Air Transport Association) highlighted that India has a major opportunity to become a global hub for Sustainable Aviation Fuel (SAF) production.

#### What is Sustainable Aviation Fuel?

- **Sustainable Aviation Fuel** – SAF is a renewable, low-carbon alternative to conventional jet fuel, produced from sources like agricultural waste, non-food crops, used cooking oil, algae, and municipal solid waste.
- **Aircraft fuel** – It is chemically similar to fossil jet fuel, making it compatible with existing aircraft engines and refuelling infrastructure.
- It can be used by blending biofuel with conventional jet fuel.
- **Lifecycle emissions** – For SAF it is upto 80% lower than conventional fuel, depending on the feedstock and production method, making it central to achieving net-zero targets in aviation.
- **Decarbonisation** – According to the International Air Transport Association (IATA), SAF alone is projected to contribute over **60%** of the aviation industry's carbon reduction targets.
- Other measures such as operational efficiency, hydrogen, electric aircraft, and carbon offsetting also play a role, but SAF is considered the most impactful and immediately deployable solution.
- **Global SAF ecosystem** – There are over 300 renewable fuel projects announced globally, but only 160 have clear SAF production plans.
- **India's current SAF ecosystem** – India has been exploring SAF for over a decade.
- Several Indian energy companies are developing SAF production capabilities and government has signalled intent to introduce blending targets, but a formal roadmap is awaited.

*The International Air Transport Association (IATA) is the global trade association of airlines established in 1945, headquartered at Montreal, Canada, and it represents around 300 airlines worldwide, accounting for over 80% of global air traffic.*

#### What are the opportunities for India to Become a Global SAF Hub?

- **Abundant feedstock availability** – India generates large quantities of biomass, agricultural waste, and ethanol, which can be channelled towards SAF production without compromising food security.
- **Existing refining infrastructure** – India's oil refineries can be upgraded to produce SAF, reducing capital investment requirements compared to Greenfield plants.
- **"Make in India for the world" potential** – India can meet domestic SAF demand and export surplus to international airlines operating in the region, creating an economic and strategic opportunity.
- **Estimated production potential** – By 2050, India could produce up to **40 million tonnes** of SAF, significantly contributing to global supply chains.

#### What are the key challenges that India must address?

- **Lack of clear policy framework** – A comprehensive SAF policy with time-bound blending targets, production incentives, and certification guidelines is urgently needed.
- **Feedstock prioritisation and sustainability** – SAF feedstock selection must avoid competition with food crops and meet strict environmental sustainability standards.
- **Global certification compliance** – SAF produced in India must adhere to international sustainability and emission reduction certification requirements to be globally accepted.
- **Investment in research and development** – India must invest in SAF R&D to diversify production technologies, including pathways like Alcohol-to-Jet, Power-to-Liquid, and others.
- **Global competition** – With the US and Europe rapidly building SAF ecosystems, India must act swiftly to capture market share.

#### What are the suggested measures?

- **Time-bound blending targets** – The government should finalise ambitious yet achievable SAF blending mandates aligned with global standards like CORSIA.
- **Financial and production incentives** – Production-linked incentives, tax breaks, feedstock subsidies, and concessional financing should be provided to encourage SAF production.
- **Sustainable feedstock aggregation** – A robust supply chain for sustainable feedstock aggregation must be established through farmer incentives and technology support.
- **Technology neutrality and competition** – All SAF production pathways should be encouraged, with market forces determining the most efficient technologies.
- **Public-private collaboration** – Strong partnerships between government, private companies, and research institutions are essential to accelerate SAF ecosystem development.

## 8.10 Decarbonising Shipping Industry

### Why in the news?

The recent developments shows that global shipping is on course towards decarbonisation by 2024-50 by means of using green fuels.

### What are the green fuels?

- **Green Fuels** – These are energy sources derived from renewable resources, designed to minimize environmental impact compared to traditional fossil fuels.

Green Fuel Type	Production
Green hydrogen	It is made by electrolysis of water powered by renewable energy.
Green ammonia	It is produced by combining green hydrogen with nitrogen using renewable energy.
Green methanol	It is synthesized from green hydrogen and captured carbon dioxide.

- **Advantages** – It reduces greenhouse gas emissions, improves air quality, and enhances energy independence.

### What are the green fuels used in shipping?

- **Existing fuels** – Merchant ships largely use Very Low Sulphur Fuel Oil (VLSFO), diesel, and methane gas stored in liquid form as fuel.
- **Transition fuel** - LNG-powered engines with their higher efficiency of some 5% are likely to be a transition fuel before shipping moves to green fuels.
- **Initial preferences of green fuel** – It is green methanol due to easier engine and storage adaptation and it emits some 10% of carbon dioxide only.
- It is almost drop-in replacement for VLSFO and can be stored as a liquid at ambient temperature.
  - Already, more than 360 ships capable of operating on methanol are either in service or in order.
- **Future preference** - Green ammonia is favored in long-term as it does not emit greenhouse gases during combustion.
- But requires significant onboard handling adjustments.
- **Rejected fuel** - Shipping will not use green hydrogen directly because of issues with storage and transportation of hydrogen, a highly volatile fuel.

### What are shipping decarbonization plans in India?

- Transitioning to green hydrogen, methanol, and ammonia reduces shipping's carbon footprint, directly contributing to national targets—such as India's net-zero by 2070 pledge.
- **Green fuel potential** - India has the land and expertise for solar power to be a major supplier of green fuels to global shipping.
- India's aggressive push in creating 1.5 GW of local electrolyser manufacturing capacity and growing industrial CO<sub>2</sub> sources (from steel and cement industries) positions India strategically to develop integrated green fuel hubs.

- **Green Fuel Hubs** - Development of green hydrogen hubs and green fuel bunkering stations at key ports like Kandla, Paradip, and Tuticorin support supply and export of sustainable marine fuels.
- **Export green fuels** – The efforts are underway in producing and supplying green fuels to Singapore.
- **Challenges** - Solar panels and electrolyzers to make green hydrogen need to be imported.

**Singapore is a fuelling station** accounting for nearly one-fourth of all global ship fuelling.

#### What are the implementation challenges?

- **Technology dependence** - Electrolyzers and some key equipment still need to be imported, increasing capital costs.
- **Pricing discrepancy** - Green fuel production is significantly more expensive than conventional fuels, driven by the cost of renewables and CAPEX (Capital Expenditure) for production facilities.
  - A 100% sustainable e-methanol as bunker fuel costs USD 1,950 per tonne (of VLSFO equivalent) in February, 2025 in Singapore, while VLSFO averaged at USD560 per tonne.
- **Lack of regulations** - Absence of standardized regulatory frameworks.
- **Supply Chains** - Scaling up renewable energy and domestic electrolyser manufacturing remains a bottleneck.

#### How India can become a marine green fuel production hub?

- **Sovereign guarantees** – They have emerged as a powerful de-risking mechanism for green methanol investments that can considerably reduce prices.
- These **government-backed assurances** can fundamentally transform project economics by enabling access to international capital markets at significantly lower interest rates.
- **Production-linked incentive (PLI) schemes for electrolyzers** – It can relieve supply chain bottlenecks by territorialising value chains and lessening transportation costs of raw materials.
- **Carbon capture, utilisation, and storage (CCUS) incentives** – They can increase the feasibility of the production of green methanol from sequestered CO<sub>2</sub>.
- **Leveraging Multilateral development bank funds** - They offer financing at rates as low as 4%, as opposed to 11-12% by domestic lenders.

#### What lies ahead?

- Governmental incentives and foreign partnerships (with Korea, Japan) can attract global shipbuilders and stimulate economies of scale.
- Integrated green fuel hubs and supportive policy frameworks can position India to revitalize its shipowning and shipbuilding industries while meeting decarbonisation targets.

### 8.11 Industrial Growth & Investments

#### Why in the news?

Recently, the Ministry of Statistics and Program Implementation (MoSPI) released the monthly growth rate of the Index of Industrial Production (IIP), which has slowed to a nine-month low of 1.2% inspite of government initiatives on investment.

#### What is Index of Industrial Production (IIP)?

- It is a measure of the rate of growth in the economy's various industry groups over a given period.
- **Aim** – To measure the short term changes in industrial output.
- **Published since** - 1950
- **Compiled by** - Central Statistical Organisation (CSO), Ministry of Statistics and Program Implementation (MoSPI)
- **Scope** – It includes mining, manufacturing, electricity as recommended by the United Nations Statistical Office (UNSO).
- But owing to constraints of data availability, the IIP compiled in India has excluded construction, gas and water supply sectors.

- **8 core industries covered** - Refinery Products, Electricity, Steel, Coal, Crude Oil, Natural Gas, Cement & Fertilisers.
- **Sectoral composition (weight-wise)**
  - Manufacturing – 478
  - Mining – 64
  - Electricity - 1
- **Measurement** – It is compiled as a simple weighted arithmetic mean of production relatives by using Laspeyre's formula.
  - *The **Laspeyres Price Index** is a consumer price index used to measure the change in the prices of a basket of goods and services relative to a specified base period weighting. It is also called the base year quantity weighted method.*
- The unit of reporting in respect of certain items like machinery, machine tools, ship building, etc. is in value terms.
- The monthly figure of production value is first deflated by the Wholesale Price Index (WPI) of the corresponding categories, released by the Office of the Economic Adviser, Ministry of Industry.
- **Current base year** – 2011-12.

### How investment is represented in capitalist economy?

#### Basis of GDP and its Linkage with Investment

- **GDP** - Gross domestic product is the monetary value of all finished goods and services made within a country during a specific period.
- **Determinants of GDP in capitalist economy** - It is determined mainly by the factors such as of private consumption, investment, and net exports.
- Government spending is minimal, and the primary drivers of economic activity are business investment, individual choices, and international trade.

#### Box 1

$$GDP \equiv \overbrace{\text{wages} + \text{profits}}^{\text{income method}} = \overbrace{\text{workers' consumption} + \text{investment}}^{\text{Expenditure method}}$$

if, workers' consumption = wages

$$\therefore \text{profits} = \text{investment}$$

- **Determinants of GDP in Mixed economy (India)** – It is determined by the interplay of both private sector and public sector activities.
- It includes consumption, investment, government spending, and net exports.
- Government policies and regulations also play a significant role.

#### Box 2

$$GDP \equiv \text{wages} + \text{profits} = \text{workers' consumption} + \text{investment} + \text{government expenditure} + \text{exports} - \text{imports}$$

- **Investment** - It is the acquisition of goods that are not consumed in the current period, but are used in the future to produce other goods and services.
- It can take many forms, including the purchase of physical capital, such as machinery, equipment, new hardware and software and buildings.

- **Economists view on investment**

**Marx**

- Investment decisions are inherently driven by the pursuit of profit and the exploitation of labour, leading to inequality and crises.
- Investments as a means for capitalists to accumulate wealth and maintain power, often at the expense of the working class.

**Baranovsky**

- He believed that investment, particularly in capital goods like machinery, could create its own demand.
- Investment can continue even without immediate final consumption, if there is a balance between investment and consumption goods.
- Even if workers' consumption is kept suppressed, economy may still flourish with higher investment and higher profits simply by the decision of the capitalists to accumulate.
- Machines can produce machines to produce more machines.

**Luxemburg**

- **Demand determines investments**
- Individual capitalists make investment decisions on anticipated demand.
- Capitalists avoid new investments if demand is weak and existing capacity underused.
- He said that revival of demand in the economy is essential for capital accumulation.

**What are the steps taken by India to boost investment?**

- **Corporate tax cuts** - The corporate tax in India was significantly reduced to 22% from 30%.
- **Capex push** - Capital expenditure surged from Rs 2 lakh crore in 2014-15 to Rs 11.21 lakh crore in 2025-26.
- **Interest rate cut** - The RBI has already delivered two consecutive rate cuts, including a 50 basis points cut to 5.50 in June 2025.

*The repo rate (repurchase rate) is the interest rate at which the central bank lends money to commercial banks when there is a shortage of funds. It is the rate at which banks borrow money from the central bank for short-term needs, usually against government securities.*

**Why investment like CAPEX spending is not helping?**

- **Capital expenditures (CapEx)** – They are funds used by a company to acquire, upgrade, and maintain physical assets such as property, plants, buildings, technology, or equipment. -
- **Gestation lags** - Large scale projects usually have long gestational periods and thus investment benefits are seen immediately.
- Building up of better infrastructure takes more time than expected.
  - **For example**, a port takes time to build and become operational.

- **Labour intensity** - If most of the money is spent on heavy duty machines, the employment generating capacity will be low.
- Lack of employment opportunities translates to lower consumption demand which slows the growth of economy.
- **Import component of spending** - All projects, whether big or small, create an immediate demand and how much of it is domestic demand and how much it is for economies outside is determined by this import component.
- A part of this capex may be spent on imports, which simply cancels out without providing adequate domestic demand.
- **Slow growth of private sector** - Gross fixed capital formation (GFCF) in machinery and equipment and intellectual property products has grown cumulatively by only 35% in the four years.

**Gross Fixed Capital Formation (GFCF)** represents the net increase in the value of fixed assets over a specific period of time in an economy. It includes land improvements, plant, machinery, equipment purchases, and the construction of roads, etc.

#### What lies ahead?

- Corporate sectors could take the responsibility of creating more jobs which may increase the consumption in the economy.
- The revival of both speculative demand and state of credit are important for the recovery of the economy.

## 9. ENVIRONMENT

### 9.1 Global Fight Against Terrorism

#### Why in News?

The Pahalgam terror attack of April 22 has exposed, yet again, the fragmentation in the global fight against terror.

#### What is the international framework against terrorism?

- **UN Security Council** – It is the principal international organ dealing with international peace and security and has also long been involved in the fight against terrorism.
- Its resolutions are legally binding on member states to combat terrorism.

#### UNSC Resolutions Against Terrorism

- **Resolution 1373 (2001)**: Requires states to prevent and suppress financing of terrorism, criminalize terrorist acts, and improve international cooperation.
- **Resolution 1540 (2004)**: Aims to prevent non-state actors from acquiring weapons of mass destruction.
- **Resolution 2178 (2014)**: Focuses on foreign terrorist fighters.
- **United Nations Global Counter-Terrorism Strategy** – It aims to enhance national, regional and international efforts to counter terrorism.
- It was adopted by consensus in 2006, thereby all UN Member States agreed to a common strategic and operational approach to fighting terrorism.
- It reaffirms that the members have the primary responsibility to implement this strategy and in preventing and countering terrorism and violent extremism conducive to terrorism.
- **United Nations Office of Counter-Terrorism** – It is responsible for promoting international cooperation in counterterrorism efforts, examining the causes and effects of terrorism and organizing efforts to prevent terrorism and extremism.
- **International Legal Instruments** – There are 19 international legal instruments that address various aspects of terrorism, such as hijacking, hostage-taking, bombings, and financing terrorist activities.
  - 1970 Hague Convention (Aircraft hijacking).
  - 1997 International Convention for the Suppression of Terrorist Bombings.
  - 1999 International Convention for the Suppression of the Financing of Terrorism.

- 2005 Nuclear Terrorism Convention.
- **INTERPOL** - It plays a crucial role in counter-terrorism by facilitating international police cooperation, sharing intelligence on terrorist networks, and providing technical support and training to member countries.
- **Financial Action Task Force (FATF)** – It is the global money laundering and terrorist financing watchdog and sets global standards to combat terrorist financing.
- **Global Counterterrorism Forum** – It is an informal, apolitical, multilateral counter-terrorism platform that was launched officially in 2011.
- **Regional Mechanisms** - Many regions have developed their own frameworks such as
  - **European Union** - EU Counter-Terrorism Strategy, Europol, and Eurojust.
  - **African Union** - 1999 Algiers Convention on the Prevention and Combating of Terrorism.
  - **ASEAN** - Convention on Counter-Terrorism and regional cooperation.

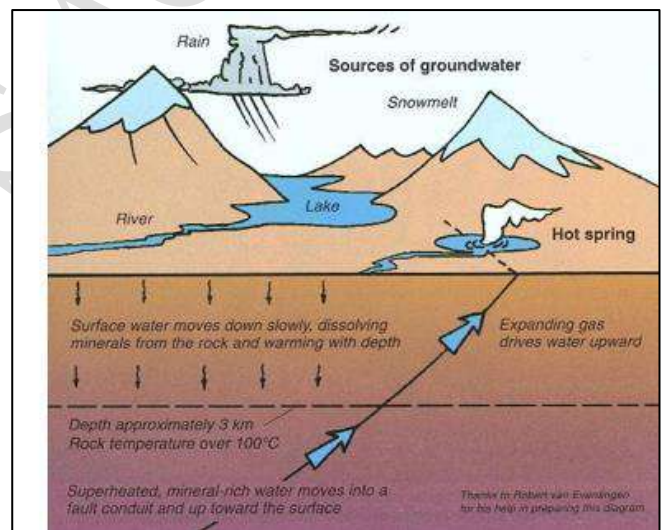
## 9.2 Drying of Himalayan springs

### Why in news?

- Recently, the findings in Himalayan regions have revealed the shrinking of Himalayan springs.

### What is the importance of Himalayan springs?

- **Springs** occur when water pressure causes a natural flow of groundwater onto the earth's surface.
- **Water tower of South Asia** - The Indian Himalayan Region (IHR) is the source of major river systems, including the *Indus, Ganges, and Brahmaputra*, fed by glaciers and numerous springs
- **Ecological stability** - These springs, critical groundwater sources, are vital for local communities and ensure the ecological and hydrological stability of downstream regions.
- **Sustaining Livelihood** – Himalayan springs stretches approximately 2,500 km and supports the livelihood of over 50 million people.
- **National security** – The military infrastructure relies on the local water systems.
- Ensuring water availability vital not only for sustaining livelihoods but also for maintaining national stability.
- These springs are known as **dhara, mool, kuan** in the central and eastern Himalayas and **chashma and naulain** the western Himalayas.



### What is the current issue?

- **Drying of spring** - According to a 2018 report by NITI Aayog, *nearly 50 % of springs* in the IHR are either drying up or have already dried up.
- **Water scarcity** - What was once a region abundant in freshwater is now marked by growing scarcity.
- **Ecological crisis** - This slow but steady disappearance of springs is not merely a rural inconvenience but it indicates a deepening ecological crisis with significant human security implications.
- Across India, approximately 200 million people rely on spring water, particularly in ecologically fragile mountain systems such as the Himalayas, Western and Eastern Ghats, and the Aravalli's.
- **social conflicts** - Reports from villages highlight rising disputes over water access often turning into verbal and physical clashes.
- **Trust deficits** - This erosion of a shared resource is weakening trust and cooperation in rural Himalayan communities, posing both ecological and socio-political challenges.
- **Implementation hurdles of schemes** - Flagship initiatives like Jal Jeevan Mission (JJM), aiming to provide functional household tap connections to all rural households by 2026, face significant implementation hurdles.

### What are the causes for drying of Himalayan springs?

- **Changing rainfall pattern** - Reduction in the long-term rainfall in the region.
- **Land cover and land use** - Change in land cover and land use.
- **Landslide** - It causes the enormous loss of springs and other shallow water bodies.
- **Floods** - It can also result in destruction of springs in the nearby regions.
- **Lack of dedicated policy** – It puts the region in more vulnerable situation.

#### What are the steps taken?

- **NITI Aayog Report** - It was only in 2018 that NITI Aayog released its first report on the Inventory and Revival of Springs in the Himalayas for Water Security
- **National Mission on Himalayan Studies (NMHS)** – **This mission** has supported several pilot initiatives focused on spring revival. Yet, these efforts remain fragmented and insufficient in scale.

#### Sikkim's Dhara Vikas initiative

- **Launched in** – 2008.
- **Objective** – To evolve a sustainable innovation in addressing water scarcity.
- **Techniques** - By employing hydro-geological techniques like contour trenches and percolation pits,
- **Mapping** – It has mapped nearly 2,000 springs, reviving approximately 200 springs and six lakes across 1,000 hectares.
- **Results** - It recharges over 1.7 million litres of groundwater annually, enhancing water access, sanitation, and crop yields for rural communities, demonstrating a scalable model for sustainable water management.

#### What lies ahead?

- **A national framework** - The vulnerable Himalayan region needs a dedicated national framework for spring-shed management, especially in
- **Integrating with schemes** like Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Integrated Watershed Management Programme (IWMP), Finance Commission grants, state initiatives, and
- **Integrating with funds** - Discretionary funds such as Members of Parliament Local Area Development Division (MPLADS), Member of Legislative Assembly Local Area Development Scheme (MLALADS), and CSR allocations
- **Place-based strategy** - A tailored and place-based approach recognises the ecological complexity, cultural nuances, and hydro-geological distinctiveness of the Himalayan region.

#### Quick Facts

- **Fresh water availability** - Though 70 % of Earth's surface is covered by water, only 2.5 % is freshwater, and less than 0.3 % is usable.
- **Water dependency** - India, home to 18 % of the world's population and 15 % of its livestock, depends on just 4 % of global freshwater resources.
- **Per-capita water availability** - According to Central Water Commission, India's per capita water availability has significantly decreased from 5,177 cubic meters in 1951 to 1,486 in 2021 and is projected to decline further to 1,367 cubic meters by 2031.
- **Less attention** - The *national water policies of 1987 and 2012*, which constitute the most comprehensive water policies of India to date, made no mention of springs.
- While urban water crises gain attention, remote Himalayan villages bear the brunt of this scarcity, often overlooked.

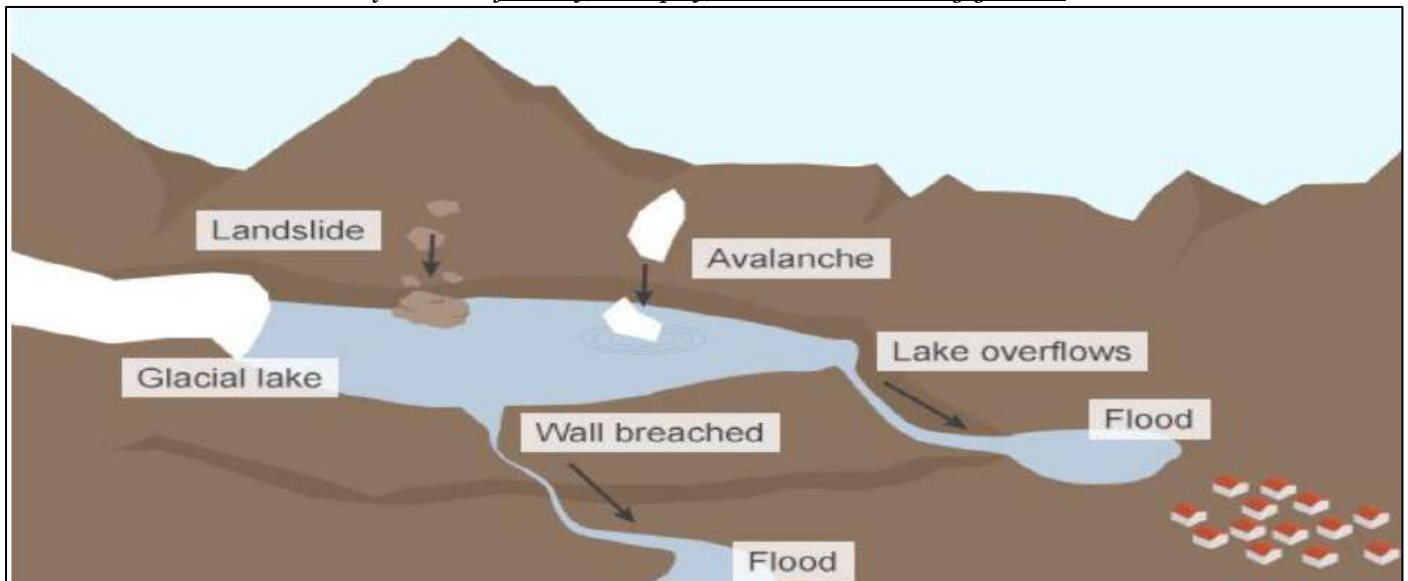
### 9.3 Glacial Lake Outburst Flood (GLOF)

#### Why in news?

Recently scientists from the International Centre for Integrated Mountain Development (ICIMOD) found that Supraglacial Lake melting is also a reason for glacial lake outburst.

## What are glacial lake outbreak floods?

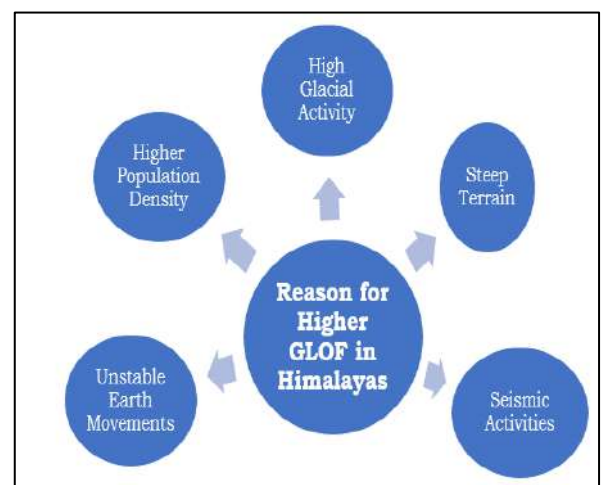
- **Glacial lakes** – A glacial lake is a body of water that originates from a glacier.
- **Formation** – It usually forms in front of, on top of, or beneath a melting glacier.



- **Classification** - ISRO classifies, glacial lakes into 4 broad categories based on their formation
  - Moraine-dammed glacial lakes
  - Ice-dammed glacial lakes
  - Erosion-based glacial lakes
  - Other glacial lakes.
- **Glacial lake outburst flood (GLOF)** - It occurs when water is suddenly released from a lake fed by a melting glacier.
- **Vulnerable regions** – Hindukush Himalayas, Andes, Alaska and Alps mountainous regions
- **Recent incidents**
  - Nepal (Limi)
  - Afghanistan (Andorab valley)
  - Pakistan (Chitral, Hunza)

## What are its causes?

- **Climatic Reasons** - Sustained warming plays a key role in the formation and gradual expansion of glacial lakes.
- **Draining of supraglacial lakes** – Recent GLOF events have occurred due to the draining of newly formed (supraglacial) ice-dammed glacial lakes.
- **Short term heat variations** - Extreme Short-term temperature can also trigger sudden events such as ice avalanches, ice calving, or slope failures related to thawing of permafrost.
- **Glacial overflow** - Severe rapid glacier movement caused due to Sudden movement of ice over a relatively short time.
- **Glacial retreat** - Hindu Kush Himalayas has given rise to the formation of numerous new glacial lakes due to climate change occurring in most parts of the region.
- **Structural weakness of moraines** - Unconnected and weak moraines, which are unstable, can collapse due to structural weakness.



*Permafrost is any type of ground from soil to sediment to rock that has been frozen continuously for a minimum of 2 years*

- **Seismic exertion** - Sudden structural change in glacier can be created due to tectonic movements in mountainous region.
- **Anthropogenic reasons** - Extensive mining, deforestation, hydropower projects, unregulated urbanization.
- Greenhouse gas emission can also alter drainage patterns.



### Challenges in identification of dangerous lakes

- **Limited resolution of data** - Freely available satellite data, such as from Landsat and Sentinel-2, have limited resolution.
- It can only identify lakes above a certain size threshold, potentially missing smaller or short-lived water bodies.
- **Less monitoring and mapping** - There is a shortage of available mapping and monitoring efforts.
- **Lack of assessment** - There is a decrease in regular assessment and analysis of potentially risky glacial lakes.

### What are the steps taken by India to prevent GLOFs?

- **Sendai Framework (2015-2030)** – It is a global blueprint for disaster risk reduction and prevention.
- **Coalition for Disaster Resilient Infrastructure (CDRI)** - CDRI is an international climate initiative by India in 2019 to promote resilient climate-proof critical infrastructure in member countries.
- **National Disaster Management Authority (NDMA)** - NDMA, headed by the Prime Minister of India, is the apex body for Disaster Management in India.
- **Institutional mechanism**- Central Water Commission (CWC)/ National Remote Sensing Agency (NRSA)/ State governments also check for landslides and blockages in rivers with the help of satellite imageries.
- **Aapda Mitra** – Launched in 2016, it is a central sector scheme implemented by NDMA to train community volunteers in disaster response in selected 30 most flood prone districts of 25 states including Sikkim.
- **Doppler radars** - The India Meteorological Department (IMD) has been using Doppler radars, a flash floods forecasting and warning systems

### What measures can be taken?

- **Regular monitoring** – Regular analysis and updating potentially dangerous glacial lakes inventories, analysing smaller, short-lived ice dammed lakes can be done.
- **Encompassing the process** - The processes involved in glacier retreat and lake formation should be incorporated in monitoring methodology for more dynamic and accurate hazard assessment.
- **Technological solutions** - Synthetic-Aperture Radar imagery can be used to automatically detect changes in water bodies, new lake formations.
- **High Density Polyethylene (HDPE) pipes**- In 2016, Sikkim used HDPE pipes to reduce water levels in South Lhonak Lake.

**Potentially dangerous Glacial lakes** can increase the vulnerability of GLOF. Nepal has 25, Tibet autonomous region of China has 21 and India has 1 potentially dangerous Lake.

- **Risk assessment**- Researchers need to continuously monitor the lakes for signs of instability and potential outburst events, this includes using satellite imagery and developing models to predict GLOF risk.
- **Uniform construction guidelines** - Developing a uniform framework for infrastructure development, construction, and excavation.
- **Early Warning Systems (EWS)** - Development of new EWS and enhancing existing EWS can be done in vulnerable areas.
- **Research** - Continued research into glacial dynamics, climate change impacts, and GLOF mitigation strategies is necessary to develop innovative approaches that reduce GLOF risk.

### Hindu Kush Himalayan Region

- **Length** - 3,500 kilometres across Asia,
- **Countries covered** - Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.
- **Significance** - Up to two billion people are dependent on the region for food, water, and energy security.
- It is also home to many irreplaceable species.

## 9.4 Revised Green India Mission Plan

### Why in news?

Recently the Union Government released the Revised Green India Mission (GIM) Plan for 2021-2030.

### What is the Green India Mission (GIM)?

- The National Mission for a Green India or GIM is a key component of India's strategy to address climate change.
- **Launch** – 2014
- **Parent framework** – National Action Plan on Climate Change (NAPCC)
- **Nodal ministry** – Ministry of Environment, Forest and Climate Change
- **Objectives** – It aims to increase forest and tree cover on 5 million hectares and to improve quality of forest cover on another 5 million hectares.
- To restore degraded ecosystems and improve livelihoods dependent on forest produce
- To improve various ecosystem services, including water availability, biomass production, and biodiversity, alongside carbon sequestration.
- Emphasizes on active participation of local communities in planning, decision-making, implementation, and monitoring of the mission's activities.

### What are the Key Features of the Revised GIM Plan?

- **Revised Green India Mission (GIM)** – It is a **10-year plan** focused on increasing of forest & tree cover, restoration of ecosystem, improving ecosystem services, and enhancing the livelihoods of forest-dependent communities.
- **Mission duration** – 2021-2030 (unveiled in June 2025).
- **Micro-ecosystem approach** – It will be done by region-specific approach, planting native species, soil and moisture conservation.
- It focuses on the vulnerable landscapes such as,
  - The Aravalli Mountain range & the Western Ghats
  - The Indian Himalayan region & Mangrove ecosystems
  - Arid regions of North-West India
- **Integration with other initiatives** – Restoration efforts will be coordinated with, State governments, for localized implementation.
- It is implemented in synergy with other national initiatives like the National Action Plan on Climate Change (NAPCC) and Aravalli Green Wall Project.

- **Carbon sink target** – The plan targets to achieve an additional *3.39 billion tonnes of carbon sink* through restoration activities by 2030.
- This will require an increase in forest and tree cover over an estimated 24.7 million hectares.
- **Native species plantation** – Preference is given to native tree species with high carbon sequestration and ecological value.
- It also *avoids monoculture or non-native species* that may harm biodiversity.
- **Integration for forest-dependent communities** – The plan emphasizes improving livelihoods for communities dependent on forests through,
  - Sustainable use of forest produce.
  - Eco-tourism and conservation-linked livelihoods.
  - Participatory forest management.
- **Scientific mapping & planning** – Visualization and Accurate collection of geospatial data and *ecological vulnerability mapping* enabling the creation of *detailed forest maps* to,
  - Identify suitable areas for national and international projects,
  - Afforestation programs and Restoration of degraded open forests,
  - Agroforestry and
  - Plantation along railways

#### What is the Need for the Revised Plan?

- **India's forest cover growth remains sluggish** – Net Forest cover increased by only 156.41 sq. km as per 18<sup>th</sup> [India State of Forest Report 2023](#).
- **Limited progress under earlier plan** – The progress was slow and scattered, with only about **11.22 million hectares** covered under plantations till 2020-21.
- **Degradation of critical ecosystems** – India State of Forest Report 2023, highlighted worrying trends that,
  - Western Ghats faces Illegal mining, deforestation, pollution, habitat loss.
  - Aravallis faces desertification, soil erosion, biodiversity loss.
  - Mangroves faces coastal degradation, rising vulnerability to cyclones.
  - Himalayas faces landslides, glacial retreat, habitat fragmentation.
- **India's global commitments** – India has made an ambitious commitment *to restore 26 million hectares* of degraded land by 2030 in UN Desertification Summit in Riyadh.
- **Address gap in monitoring & implementation** – Previous phases of GIM lacked robust data integration, monitoring mechanisms, and scientific assessments.
- **Landscape-specific solutions** – Vulnerable ecosystems require *region-specific restoration strategies*, rather than a one-size-fits-all plantation model.

#### What lies ahead?

- Strong coordination between the Centre, State governments, and local communities.
- Mobilising funds from private sector and international climate finance mechanisms.
- Innovative mechanisms like carbon credits and payment for ecosystem services.
- Adoption of Best Practices and Technology from global restoration success stories and adopting nature-based solutions can be critical.
- Public disclosure of restoration progress to ensure greater transparency and accountability.

### 9.5 Tackling Delhi Air Pollution

#### Why in the news?

Recently, the Commission for Air Quality Management directed that all end-of-life vehicles (ELV) will not be given fuel in Delhi starting July 1, 2025.

#### What are the existing air pollution regulatory mechanisms in Delhi?

- **Commission for Air Quality Management in NCR & Adjoining Areas (CAQM)** - It has been set up for Air Quality Management in National Capital Region and Adjoining Areas for better co-ordination and resolution of problems surrounding the air quality index.
- **End-of-Life Vehicle Action** – CAQM has banned the old vehicles with are 10 years for diesel/ 15 years for petrol vehicles.
- **Graded Response Action Plan (GRAP)** – It is a set of emergency measures implemented in the Delhi-NCR region to combat air pollution.
- It is activated based on the daily average Air Quality Index (AQI) in Delhi and involves a series of actions to be taken at different AQI levels.

Stages of GRAP	Action to be Taken
<b>Stage I: Poor (AQI 201-300)</b>	<ul style="list-style-type: none"> <li>• Public advisories are issued</li> <li>• Dust control measures are intensified,</li> <li>• Restrictions on open burning are enforced,</li> <li>• Orders on overaged diesel/petrol vehicles are enforced.</li> </ul>
<b>Stage II: Very Poor (AQI 301-400)</b>	<ul style="list-style-type: none"> <li>• Actions from Stage I continue.</li> <li>• Restrictions on diesel generator sets are imposed.</li> <li>• Mechanized sweeping and road-dust sprinkling are enhanced.</li> <li>• Targeted actions at pollution hotspots are implemented.</li> </ul>
<b>Stage III: Severe (AQI 401-450)</b>	<ul style="list-style-type: none"> <li>• Actions from Stages I and II continue.</li> <li>• Construction activities are restricted.</li> <li>• Heavy vehicle entry is limited.</li> <li>• Brick kiln operations are suspended.</li> <li>• Restrictions on BS III petrol and BS IV diesel light motor vehicles (LMVs) are imposed.</li> </ul>
<b>Stage IV: Severe+ (AQI &gt;450)</b>	<ul style="list-style-type: none"> <li>• Actions from Stages I, II, and III continue.</li> <li>• Complete halt on construction and demolition activities.</li> <li>• School closures may be considered.</li> <li>• Stricter traffic control measures, potentially including odd-even schemes, are implemented.</li> <li>• Industrial units may face shutdowns</li> </ul>

- **BS-VI Compliance** - Starting November 1, 2025, only BS-VI compliant, CNG, or electric commercial vehicles from outside Delhi will be allowed entry.
- **Anti-Pollution Devices** - The use of anti-smog guns, water sprinklers, and dust suppression measures is being enforced.
- **End-of-Life Vehicle Action** - The Delhi government is taking action against old, polluting vehicles (15 years for petrol, 10 years for diesel).
- **Prevention of Stubble Burning** – CAQM has recommended in-situ and ex-situ management of stubble burning in villages in Punjab and Haryana around New Delhi.

Other Measures Taken	
Category	Key Actions
<b>Green Initiatives</b>	<ul style="list-style-type: none"> <li>• 7 million saplings planted under 'Ek Ped Maa Ke Naam'</li> </ul>

<b>Waste Management</b>	<ul style="list-style-type: none"> <li>• Landfills clearing target by 2027-2028</li> <li>• Expansion of waste-to-energy plants</li> <li>• Promotion of waste segregation</li> </ul>
<b>Innovative Solutions</b>	<ul style="list-style-type: none"> <li>• Cloud seeding pilot programme</li> <li>• ‘Startup Innovation Challenge’</li> </ul>
<b>Public Engagement</b>	<ul style="list-style-type: none"> <li>• SMS alerts for vehicle owners;</li> <li>• Community monitoring by ‘Environment Doots’</li> </ul>

### What are the challenges associated?

- **Failure in emission compliance** – the failure to strictly enforce emission compliance on all vehicles on the road, not just the old ones.
- **More responsibility on owners** – Shifting environment responsibility to the vehicle owners considering vehicle age as a sole criterion for pollution, rather focusing on engine, fuel efficacy with policy framework, keeping more burden on vehicle owners.
- **Regulatory gaps** - Inefficient testing frameworks, and poor enforcement of fuel efficiency standards reveals a troubling reality.
- **Incomplete policy framework** - Policy emphasis given on age rather the working efficiency of the vehicles.
- **Problems with vehicle scrapping ecosystem** - most ELVs end up with unauthorized scrap dealers or are resold in states with laxer rules, merely shifting pollution elsewhere.
- **Overlooking circular economy** - The embedded emissions associated with manufacturing new vehicles are ignored, effecting overall emission compliance.

### What measures can be taken?

- **Creating robust fuel and emissions control strategy** – Policy may be driven by emission and fuel compliance rather just the age of the vehicles.
- **Enhancing Infrastructure** - With the planned *installation of ANPR cameras, Delhi can create an automated system* to restrict entry for high-emitting vehicles based on real-time data.
- **Market-based mechanisms** - Considering transferable scrapping credits linked to Aadhaar and vehicle registration, which can reward owners scrapping vehicles with incentives or offset allowances for new purchases or public transport usage.
- **Compliance-based support** – People who are complying with regulations should be encouraged further.

### What lies ahead?

- Recently, Delhi government unveiled ambitious ***Air Pollution Mitigation Plan 2025***, which can bring together technology, stricter rules, and public support to fight pollution.
- The plan’s success will depend on how well is carried out and how much nearby states cooperate, and it can be a model for the other major cities in India tackling air-pollution.

## 9.6 Urban Aerosol Pollution

### Why in the news?

A recent study on aerosols levels of 141 cities in India from 2003 to 2020 by IIT at Bhubaneswar, has shed new light on urban aerosol pollution patterns across India, revealing a north-south divide in how pollution domes form over cities.

### What is urban aerosol pollution?

- **Urban aerosol pollution** – It refers to the presence of *small, solid, or liquid particles* suspended in the atmosphere within cities.
- **Two types**
  - Urban aerosol pollution island
  - Urban aerosol clean island

- **Urban aerosol Pollution Island** – It refers to the cities that show higher aerosol levels than the surrounding areas.
- It occurs, whenever less transport of aerosol or pollution is happening irrespective of the season.

**Aerosols**

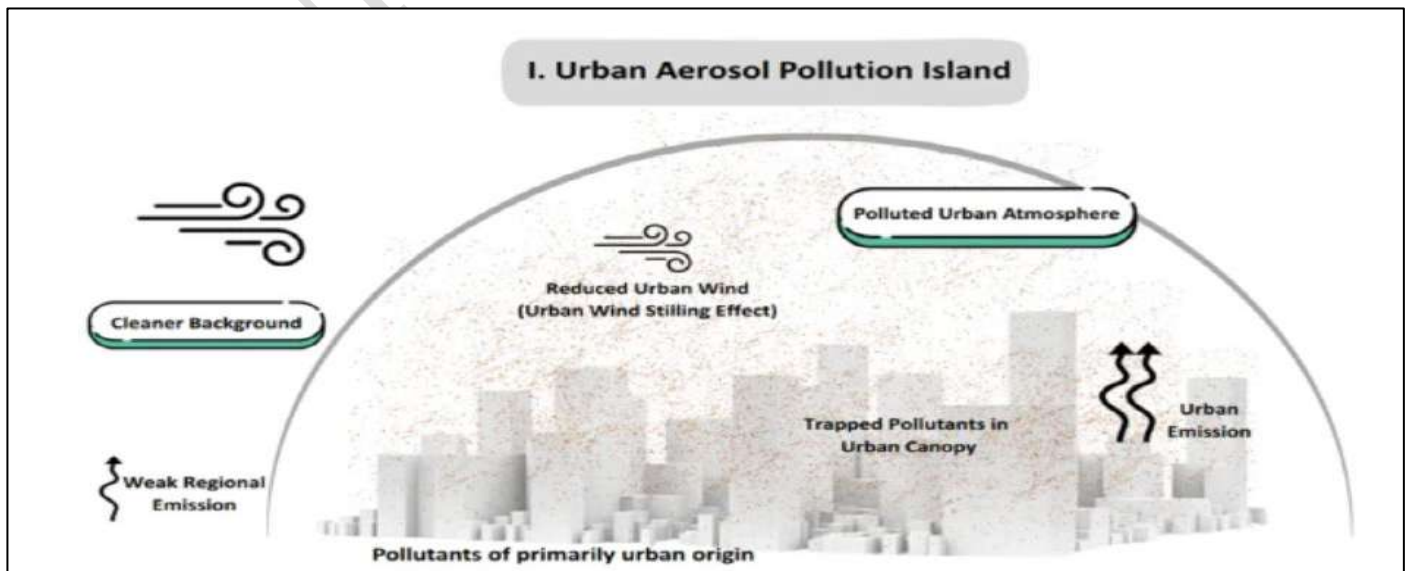
- It is a suspension of fine solid particles or liquid droplets in a gas, most commonly in air.
- **Sources**
  - Natural cause – Volcanoes
  - Anthropogenic cause - Burning fossil fuels.
- **Size** – They are typically small, with diameters *often less than 1 micrometre*, allowing them to remain suspended for extended periods.
- **Role** – They play a role in atmospheric processes, influencing air quality, weather, and climate.

- The aerosol levels were not uniformly higher in the surrounding areas compared with the city.
- **Urban aerosol clean island** – It refers to the cities that show relatively lower aerosol levels compared with the surrounding areas.

**What is the level of urban aerosol pollution Island in India?**

- **Regional variation** – 57% Cities in south and southeast India show higher aerosol levels inside the city compared to neighbouring parts.
- **Causes** – This occurs due to local pollution sources which dominates aerosol presence and lack any large external source of pollutants coming from elsewhere.
- It became distinct in many cities during no dust scenario.
- **Consequences** – This results in a typical “pollution dome” where urban areas are more polluted than their rural surroundings.

*A **pollution dome** is a phenomenon where pollutants, such as smog and particulate matter, become concentrated and trapped in the atmosphere usually above a city or industrial area, forming a dome-like layer of polluted air.*

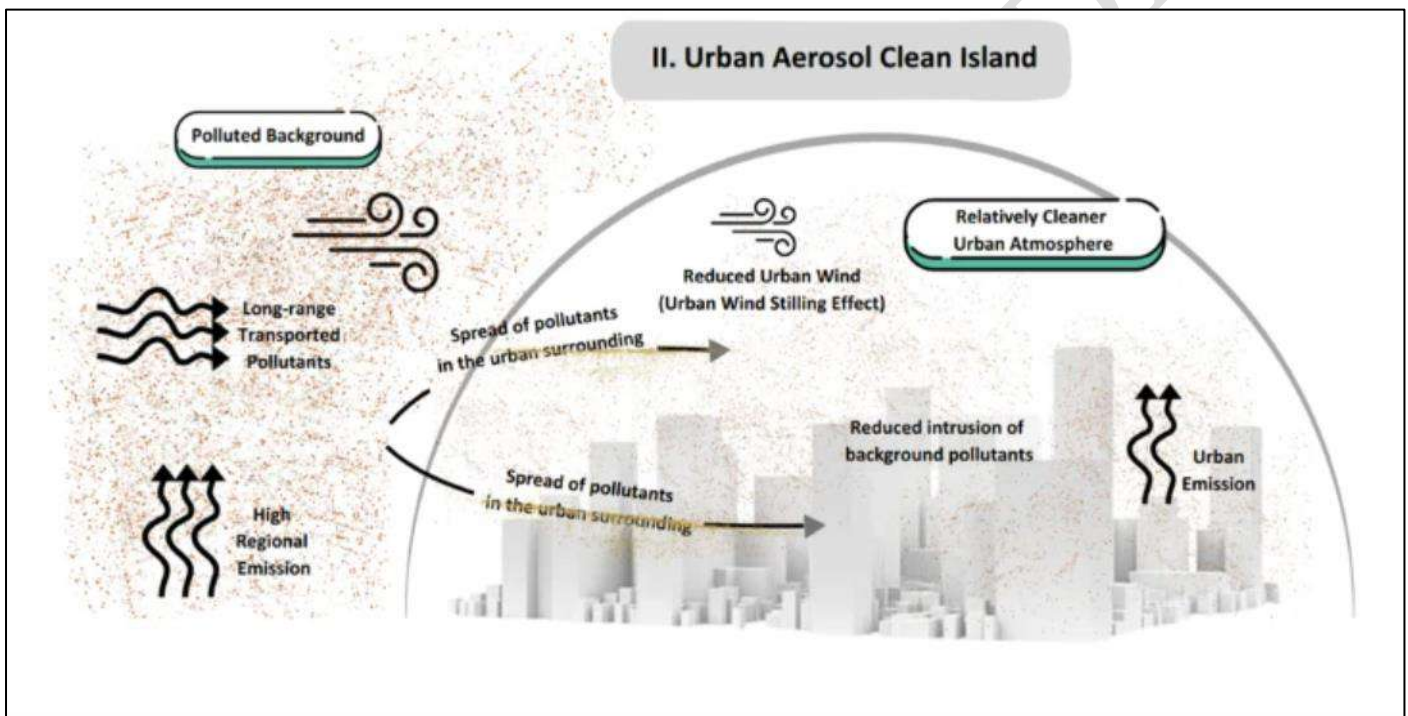


- **Higher level** – It is in the areas southwest of the city, which are located upstream of the dust flow.

- **Lower level** – It is in the northeast side of the city situated downstream of the dust flow that exhibited less aerosol levels which almost matched the levels seen in the city.
- It is a trail that continues downwind for some distance.

### What is the level of urban aerosol clean Island in India?

- **Regional variation** – 43% of cities in northwest and northern Indo-Gangetic Plain display lower aerosol levels within city limits than in surrounding areas.
- North Indian cities, despite being blamed for poor air quality, are found to have no consistent pollution domes.
- **External aerosol source** - Aerosols from external sources such as dust from the Thar Desert and biomass burning contribute heavily to background pollution.
- It became pronounced in many cities in high dust case.
- Clean island effect is whenever the pollution transport from outside is enhanced.
- **Cities as barriers** – The infrastructures of the cities block aerosol entry and creating cleaner urban zones compared to their surroundings.
- This unexpected pattern is linked to a phenomenon known as urban wind stalling effect.



### Wind Stilling Effect

- It refers to a weakening of surface winds across highly urbanised cities where the buildings and infrastructure reshape local climates, creating zones of atmospheric stagnation.
- These zones collectively lead to invisible barriers around the city in the upwind regions.
- They partially block the entry of long-range aerosol pollution, especially mineral dust from the nearby arid regions.
- This results in cities having relatively less aerosol loading than the surrounding areas.
- Global megacities such as Shanghai, Atlanta and a few European cities have urban aerosol clean islands.

### Seasonal variation in India

- **During monsoon** – Not studied due to non-availability of data due to clouds and rain.
- **Pre-monsoon** – Clearly observable.
- **Post-monsoon** – Normally disappears but seen again in winter due to dry conditions.

### What lies ahead?

- Deeper scientific understanding could help to evolve an idea on how urban growth and emerging micro-climates influence air pollution and its spatial patterns.
- Creation of truly sustainable, climate-resilient cities will depend on our capability to understand and anticipate these multifaceted interactions as cities continue to grow.

## DISASTER MANAGEMENT

### 9.7 Catastrophic (Cat) Bonds

#### Why in the news?

Recently, India is considering the use of catastrophic bonds for disaster resilience and management.

#### What are catastrophic bonds?

- **Definition** - Catastrophe bonds are hybrid financial instruments that combine features of insurance and debt.
- **Origin** - It originated in the U.S. in late 1990s after hurricanes.
- **Objective** - To **strengthen disaster risk financing** and enhance climate resilience amid the increasing frequency of natural disasters.
- **Importance** – They turn a country’s hazard exposure into a tradable security, opening access to a wider pool of capital beyond traditional insurers and reinsurers.
- They allow at-risk entities, usually sovereign states, to transfer pre-defined disaster risks to investors, thereby enabling quicker payouts and reduces counterparty risk.
- They help in **diversification of natural hazard risks**.
- They are statistically independent of traditional financial risks, making them valuable for risk-averse portfolios.

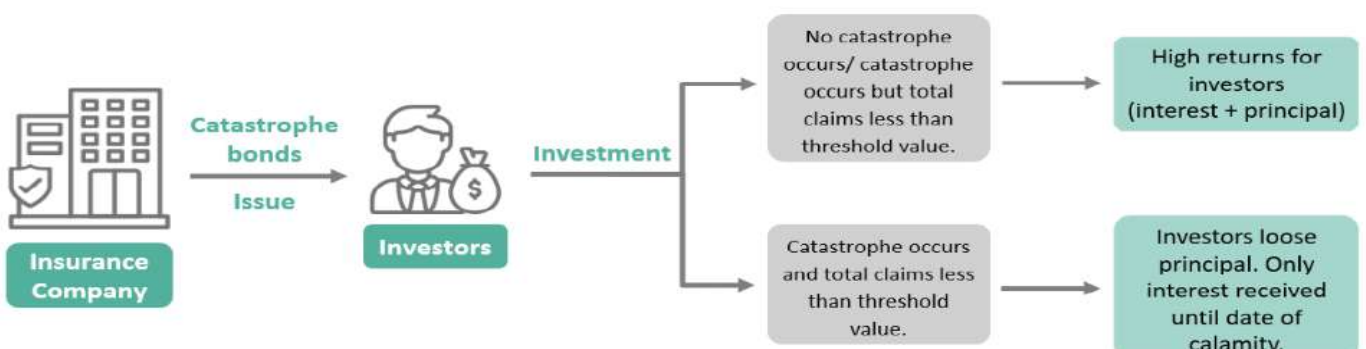
Nobel laureate Harry Markowitz’s emphasis on diversification aligns with the strategic rationale for including **cat bonds in investment portfolios**.

#### How do Cat bonds work?

- **Creation** – They are created by sovereign nations, which sponsor the bond and pay the premium, with the principal being the sum insured.
- **Issuance** – The sponsor requires an intermediary to issue the bond, thereby reducing counterparty risk.
  - **Intermediaries** - It can include the World Bank, the Asian Development Bank, or a reinsurance company.
- **Purchaser** – It is generally purchased by global investors, including pension funds, hedge funds, and family offices, who are attracted by high returns and the diversification benefits of non-market associated risks.

**U.S., catastrophe bonds** have seen over \$180 billion in issuances globally, with approximately \$50 billion currently outstanding, since their inception in the late 1990s following major hurricanes.

## What are Catastrophe Bonds?



- **Coupon rates** – If a disaster does occur, the investor runs the risk of losing a part of the principal, a key reason for *higher coupon rates of such bonds*, compared to regular debt instruments.
- The risk level and frequency of disaster occurrence directly influence coupon rates.
  - **For example**, *earthquake-related bonds often offer lower premiums (1-2%) compared to those covering cyclones or hurricanes.*

### Why does India need Cat bonds?

- **Less insurance penetration** - The traditional insurance coverage remains sparse, especially for individuals and small businesses.
- **Lack of disaster insurance** - Less availability of insurance on individual property and livelihoods leaves much of the *population exposed to irretrievable damage and loss.*
- **Burden on public finance** – It places a significant burden on public finances *for recovery, rehabilitation and reconstruction.*
- **Increased climate crisis** - As climate change intensifies the frequency and severity of natural disasters, India is increasingly vulnerable to financial shocks arising from catastrophic disasters.
- India faces an increasingly precarious climate future with rising occurrences of floods, cyclones, forest fires, and earthquakes.

### How could sponsoring cat bonds help India?

- **Reserving the finances for disaster recovery** - Leverage its strong sovereign credit profile to negotiate favourable terms.
- **Transfer of risk** - It *takes away risk from the government to global investors.*
- **Ensure quicker post-disaster recovery** – Finances for pre-defined risk helps in easier availability of risk finances.
- **Lowers bond premiums** – India's proactive disaster management steps, including an annual allocation of *Rs.15,000 crore (\$1.8 billion)* for mitigation and capacity building, could further.

### What is India's potential in South Asian Cat bonds?

- **India's financial stability** - India could be lead-sponsor for a South Asian cat bond, given that most such regional risks remain unhedged.
- **Regional collaboration** - India is well-positioned to lead the creation of a regional catastrophe bond framework for South Asia.
- **Risk spreading** - It spreads risk across multiple countries and reduce overall premium costs.
- **Financial preparedness** – India could foster financial preparedness across the region of south Asia.
- **Cover high-impact hazards**
  - **Earthquakes** across India, Nepal, and Bhutan
  - **Cyclones and tsunamis** are affecting India, Bangladesh, the Maldives, Myanmar, and Sri Lanka.
- By pooling diverse risks across geographies, a South Asian cat bond would be more attractive to investors and more robust in coverage.

### What are the challenges?

- **Insufficient design** - Poorly designed bonds may miss payouts due to rigid trigger conditions.
  - **For example**, *a bond triggered only by earthquakes above 6.6 magnitude may not activate for a 6.5 event, even if damage is severe.*
- **Wasted premium payments** - Governments may question the cost-benefit ratio if no disasters occur during the bond period, leading to a perception of lost premium payments.
- **Limited coverage** - Most cat bonds generally covered primary risks like major hurricanes and earthquakes.
- It can be more expensive to build bonds for secondary risks like floods, wildfires, etc. which are becoming more frequent due to climate change.
- **Lack of technical knowledge** – These bonds are difficult to value and understand for generalist investors, requiring specialized knowledge and reliance on catastrophe modelling firms.

## What lies ahead?

- Accountable insurance framework can be made through, transparent cost comparisons with past disaster recovery expenditures.
- Engagement with reliable intermediaries and risk modellers could be an efficient way to administer the disaster insurance network.

## 9.8 Towards Resilient and Prosperous Cities in India Report

### Why in News?

Recently, the World Bank has released a report titled *Towards Resilient and Prosperous Cities in India* estimating Indian cities will require \$2.4 trillion by 2050 to build climate-resilient infrastructure and services.

### What is key findings of the report?

#### Report

- **Released by – World Bank**, in collaboration with the Union Ministry of Housing and Urban Affairs.
- **Objective** – Assessing urban climate risks and economic opportunities.
- **Increase in population growth** – The country's urban population will nearly double to 951 million by 2050
- **Job creation** – Cities will account for 70 % of all new employment generated 2030.
- **Increase in flood risk** – Climate change and urbanization patterns are the main drivers of stormwater-related or pluvial flooding risks, with a forecasted increase in risk of 3.6 to 7 times by 2070.
  - Annual estimated losses just from pluvial flood related flooding are likely to increase up to \$14-30 billion by 2070, exposing up to 46.4 million people.

*Flash floods is highly localized are recurring events in urban spaces occurring in a much shorter span of time (3-6 hours), which is often associated with cloudbursts.*

#### 3 Types of Urban Flooding – World Bank

- **Pluvial flooding** – This occurs when heavy rainfall exceeds the soil's absorption and drainage capacity, leading to surface runoff.
- **Coastal flooding** – It is caused by storm surges and high winds during high tides.
  - It is exacerbated by rising sea levels and low atmospheric pressure.
- **Fluvial flooding** – This results from intense rainfall or snowmelt causing rivers to overflow.
  - It is characterized by a brief spike in water levels that recedes slower.
- **Higher fatalities** – Heat-related deaths can double to over 3 lakh each year by 2050 due to global warming and the urban heat island phenomenon.
  - Among 10 large cities in India, from the period 1983-1990 to 2010-2016, exposure to dangerous extreme heat stress has increased by 71 %.

*Urban Heat Island effect is a local and temporary phenomenon experienced when certain pockets within a city experience a higher heat load than surrounding or neighboring areas on the same day.*

### What are the recommendations of the report?

- **Enhance autonomy** – Indian cities should be granted greater autonomy to invest in climate resilience, adaptation, and mitigation.
  - Evidence suggests that cities with more decision-making power tend to outperform others in implementing effective climate solutions.
- **Localized approaches** – Climate strategies tailored to local conditions rather than imposed uniformly across all states.
- **National and state-level support** – Coordinated interventions at national and state levels are crucial to support and amplify local efforts in climate adaptation and mitigation.

- **Boosting private sector engagement** – Encouraging greater participation from private enterprises in city-level climate initiatives.
- **Creating a financing roadmap** – Establishing clear pathways for sustainable funding and investment in climate projects.
- **Building municipal capacities** – Setting standards and providing resources to strengthen the capabilities of urban local bodies.
- **Capital mobilization** – Blending public-private funds accelerates resilient urban infrastructure development.

#### What are the challenges in enhancing urban autonomy?

- **Weak devolution of powers** – 74th Constitutional Amendment aimed to empower states to delegate responsibilities like urban planning, land use regulation, supply management, and slum improvement to ULBs.
- However, *many states have fallen short in fully realizing this potential.*
- **Inadequate financial resources** – ULBs frequently face significant financial constraints that hinder their ability to implement climate-resilient infrastructure and policies.
- **Weak institutional capacity** – Many ULBs also struggle with insufficient technical skills and administrative capabilities necessary to design and implement effective climate adaptation strategies.
- **Lack of structured governance** – The absence of coordination among various urban authorities obstructs the seamless integration of climate resilience measures across different sectors.
- **Inadequate data** – Lack of access to accurate and current data regarding climate risks and urban infrastructure, which are crucial for making informed decisions.

*The Union Budget 2025-26 announced that the government will set up the **Urban Challenge Fund** of Rs 1 lakh crore to implement the proposals for 'Cities as Growth Hubs', 'Creative Redevelopment of Cities', and 'Water and Sanitation.'*

#### What lies ahead?

- Measures like shifting working hours to early morning and late afternoon, urban greening, early warning systems, and cool roofs can save over 1.3 lakh lives.
- Building climate resilient infrastructure is needed for both growth and sustenance in future.

#### Quick facts

- **Historically** – The first municipal body was established in Madras in 1687, followed by Bombay and Calcutta.
  - **Lord Ripon** considered as *the father of local self-government in India.*
- **Constitutionally** – The 74th Constitutional Amendment Act of 1992 gave constitutional status to Urban Local Bodies (ULBs) to strengthen local self-governance.
  - Part IX-A – Deals with the composition, roles, and responsibilities.
  - 12th Schedule – It specifies 18 functions that are devolved to these ULBs.

### 9.9 Challenges in Prohibiting Plastic Pollution

#### Why in News?

*Recently, environmental activists and health experts are drawing attention to how the plastic industry mirrors the tobacco industry's strategies and how plastic pollution increases in Global South nations like India.*

#### How plastic industry influences policy making?

- Plastic industries backed by fossil fuel giants, *mirrors tobacco industry strategy* to evade its scrutiny and its responsibility.

#### Shifting of Responsibility

- **Tobacco industry** - Advertisements for tobacco run with a disclaimer "smoking is injurious to health" while promoting the product.

- **Plastic industry** – Plastic-makers have *blamed consumers for not recycling* while diverting attention from corporate accountability.

### Funding to Mislead Public Relations (PR)

- **Tobacco industry** - Tobacco companies have historically *funded studies denying their effects on the body*.
- **Plastic industry** - The plastic industry promoted recycling as a resolution from the 1980s despite *privately acknowledging its economic and technical impracticality at measures*.
- Some plastic industry groups started public campaigns saying that plastic can be recycled. They did this to stop governments from banning plastic.

### Greenwashing

- **Tobacco industry** - Tobacco companies *marketed “light” and “mild” cigarettes as safer*.
- **Plastic industry** - Likewise plastic industries labelled, “biodegradable or compostable”.
- This in turn can give consumers a *false impression of these plastics’ real-world environmental impact*.
  - *Coca-Cola was accused of greenwashing* after quietly dropping its goal of 25% reusable packaging by 2030 and scaling back key recycling targets while continuing to promote its sustainability credentials.

*Greenwashing* refers to *misleading the general public into believing that companies, sovereigns or civic administrators are doing more for the environment than they actually are. It may involve making a product or policy seem more environmentally friendly than it is in reality.*

*Public relations (PR)* is the set of techniques and strategies related to managing how information about an individual or company is disseminated to the public, and especially the media.

### Why Global South is vulnerable to increasing plastic pollution?

- **Shifting focus of producers** - Plastic producers of developed nations are shifting towards Global South countries because the rules are less strict comparing to Global North.
- **Limited public awareness** – It results in increasing demand and consumption of harmful plastics by the public.
- **Demand by consumers** – *Plastics products are cheap and easy to carry*.
  - **OECD’s ‘Global Plastic Outlook’ report in 2022** - Plastic consumption is *projected to more than double in Sub-Saharan Africa and triple in Asia* while its growth in North America and Europe will be moderate in same period of time.
- **Weaker environmental laws** – Global South countries have weak law to control the plastic pollution.
- **Lack of enforcement** – Even the existing regulation are not enforced consistently and strictly.
- **Inadequate waste management systems** – These nations doesn’t have proper waste collection and recycle system.

### What are challenges in regulating plastic pollution in India?

- **Lack of coverage** – India’s ban of 19 single-use plastics covers *only around 11% of its single-use plastic waste*.
- **Weak enforcement** – The ban on selected items are has been changeable and exceptions are also provided for certain productions.
- **Increasing waste generation** – It creates pressure on existing systems.
- **Health risks** – People suffer from *respiratory illnesses and infections*.
- **Social risks** – Sanitation workers live below the poverty line, *lacking stable incomes and less social protections*.

*National Action for Mechanised Sanitation Ecosystem (Namaste)* is a Central Sector Scheme. It is a joint initiative of the MoSJE and the Ministry of Housing and Urban Affairs (MoHUA).

### Measures Taken in India

- **Plastic Waste Management Rules 2016 – It was amended in 2022 which** prohibiting identified single use plastic items that have low utility and high littering potential.
- Extended producer responsibility require manufacturers to take responsibility for plastic they generate, financially and operationally.
- **NAMASTE Scheme** - National Action for Mechanised Sanitation Ecosystem was launched in 2024.
- It aims to integrate waste pickers into formal waste systems by providing safety measures, health insurance under Ayushman Bharat, and access to social security benefits

#### What lies ahead?

- Launching public education campaigns may raise awareness about the false environment claims of companies with regard to plastic recycling.
- Countries can implement rigorous and legally binding labeling protocols to ensure accurate representation of plastic recyclability.
- Legally recognizing and incorporating waste pickers into formal waste management processes can be done to ensure that they receive employment rights and social benefits.

### 9.10 Nature-based Solutions (NbS) for urban flooding

#### Why in the News?

Recent increase in disruptive urban flooding including 2024 Bengaluru floods prompts to explore opportunities about nature-based solutions in controlling urban flooding.

#### What is urban flooding?

- **Definition** - United Nations (UN) defines urban floods as the *inundation of land or property in a built environment*, particularly in densely populated areas, caused by rainfall exceeding the capacity of drainage systems.
- **Causes**
  - Systemic gaps in planning, land use, and infrastructure management.
  - Prioritising efficient stormwater drainage rather than local water retention or recharge.
  - Extensive concretisation of stormwater drains.
  - Reduced natural water-holding capacity of the stormwater drains and water bodies.
  - Encroachment of water bodies and stormwater channels.
  - Climate change and erratic monsoons.
- **Consequences** – It leads to widespread waterlogging and traffic congestion, thereby severely affecting daily mobility.
- It also results in temporary road closures across the city.
- **Vulnerable cities** - Mumbai, Chennai, and Kolkata, are situated along the coast, making them vulnerable to both sea level rise and land subsidence.

Recent urban floods in India	
2015	Chennai
2020	Mumbai
2020	Hyderabad
2023	Delhi
2024	Bengaluru

To know more about urban flooding, click [here](#)

#### What is Nature-based Solutions (NbS)?

- **Definition** – They are actions to *protect, conserve, restore, and sustainably use and manage ecosystems* in a way that addresses social, economic, and environmental challenges while simultaneously benefiting human well-being and biodiversity.

- **For example**, Renewable energy, Beekeeping, Ecotourism, Agroforestry are some examples of nature-based solutions.
- **Global support** – The design, implementation, and evaluation of Nature-based Solutions are supported **by the IUCN Global Standard for Nature-based Solutions**.
- The Global Standard helps users shape their solutions and make them truly effective through 8 criteria and 28 indicators, supported by guiding questions.
- **Importance** – They target major challenges like climate change, disaster risk reduction, food and water security, biodiversity loss and human health, and are critical to sustainable development.
- **Benefits** – It can support biodiversity, enhance groundwater recharge, mitigate urban heat, and create opportunities for local employment and community stewardship.
- **Challenges**
  - Absence of standardised design frameworks
  - Limited documentation of long-term impacts
  - A disconnect between pilot initiatives and citywide planning or investment decisions.



**MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme)** of India is a major contributor to global Nature-based Solutions, says report released at COP16 in Riyadh. MGNREGS fosters sustainable development, promotes environmental conservation and social inclusion in rural areas.

### How it can be used for controlling urban flooding?

- NbS approach will help the city manage stormwater more sustainably, while also contributing to water security and climate resilience.
- It also guide the strategic integration of green and blue infrastructure within the existing urban area, optimising flood resilience without requiring large-scale redevelopment.
- **Developing green infrastructure** – It includes initiatives like like rain gardens, wetlands, bioswales, green roofs, and permeable pavements
- **Creating sponge cities** – They are the cities that uses green infrastructure to absorb and purify rainwater, reducing flood risks and improving urban quality.
  - Guangming District in China incorporated Nature-based solutions interventions, which have resulted in a 72% annual runoff control rate and a 62% reduction in diffuse pollution.
- It also involves decentralised green infrastructure, improvements to water and wastewater systems, and active community engagement.

Bengaluru is known as the “**Garden City**,” because it has more than 1,100 parks and over 250 playgrounds.

### NbS based Urban Flooding Control in Bengaluru

- **Existing potential** – It has more parks and playgrounds which can act as water retention geographical feature.
- Many apartment complexes and educational institutions also contain green spaces that could be repurposed or enhanced for stormwater retention.

- These existing assets offer a strong foundation for redesigning how the city absorbs and manages runoff.

### What lies ahead?

- A practical way forward would involve piloting studies coupled with monitoring and evaluation.
- Integrating these findings into municipal planning frameworks that are supported by cross-departmental coordination.
- Developing hydrological modelling to simulate different rainfall scenarios and determine the types, scales, and locations of NbS needed to reduce flood inundation and water depth.
- Targeted funding will be critical for moving beyond demonstration projects toward systemic change.

## 10. SCIENCE & TECHNOLOGY

### 10.1 GPS Interference

#### Why in the news?

Recently, GPS interference has emerged as one of the biggest challenges for seafaring vessels and aircraft.

#### What is GPS interference?

- **Global Positioning System (GPS)** – It is a space-based radio-navigation system, owned by the U.S. Government and operated by the United States Air Force (USAF).
- It can pinpoint a 3-dimensional position to meter-level accuracy and time to the 10-nanosecond level, worldwide and 24/7.
- **GPS Interference** – It refers to spoofing or jamming, two types of deliberate cyber-attacks on GPS signals, which disrupt or deceive vehicles' navigation systems.
- While both are often used synonymously with each other, spoofing and jamming refer to slightly different.

GPS jamming	GPS spoofing
Involves a <b>device (jammer)</b> emitting strong radio signals on GPS frequencies to <u>overpower weaker signals</u> .	Involves a device transmitting signals on the same frequencies used by GPS satellites, <u>blocking the GPS receivers</u> from acquiring or maintaining the right satellite signals.
It disrupts the functioning of GPS systems by <u>rendering receivers unable to determine location or time</u> .	Unlike jamming, which disrupts signals entirely, it <u>deceives the receiver into trusting false data</u> .

- **Causes** – GPS interference can occur due to various reasons, not all of them malicious.
  - Electromagnetic radiation from nearby devices
  - Adverse atmospheric conditions like ionospheric disturbances, solar activity (such as flares)
  - Intentional jamming/spoofing.

#### Why is it dangerous?

- **Disrupts military operations** - Spoofing can cause a pilot to misjudge the aircraft's position, increasing the chance of collisions with terrain or other aircraft.
  - In 2024, reports indicated up to 700 daily GPS spoofing incidents globally, highlighting the scale of the threat.
- **Interrupts civilian transport** – It can severely disrupt civilian transport by causing navigational errors, leading to potential collisions, groundings, and traffic chaos.
- **Disrupts maritime navigation** – It can also lead to piracy, disastrous events.
  - Persian Gulf and the Red Sea amid ongoing conflicts are one of the vulnerable regions.

- **Rising conflicts between nations** – If one nation suspects another of GPS interference, it can lead to accusations, diplomatic tensions, and even retaliatory measures, potentially escalating the situation.
- **Airspace avoidance** – For aircraft, spoofing is one of the primary risks of being in the airspace of countries in war.
- It forces the nations to immediately avoid these areas as a preventive measure.
  - **For example**, avoiding respective airspace during Russia and Ukraine conflict.
- **Navigation dependence vulnerability** - A mere dependence on GPS navigation is dangerous, if GPS interference happens, leads to disruptions in daily operations and disasters.
  - **For instance**, during the 1999 Kargil war and during in 2009 and 2012 Brahmos missile tests - US denied access to GPS.

*Maritime tech consultancy Windward's Q1 2025 data show a 350% rise in **spoofing incidents in the Red Sea alone** compared to 2024—with some vessels having experienced sudden position jumps of hundreds of nautical miles.*

- **Displays false information** – Leading to collision of ships, aircraft accidents, and civilian vessel crashes etc.

#### How it can be prevented?

- **Using alternative navigation systems** - Aircraft experiencing GPS spoofing mid-air can rely on other navigation systems like
  - **Inertial Navigation Systems (INS)** – It use gyroscopes and accelerometers to track the aircraft's current position based on its last known location.
  - **VHF Omnidirectional Range (VOR) and Distance Measuring Equipment (DME)** – It provide ground-based radio navigation, allowing pilots to further cross-check their position.
  - **Instrument Landing Systems (ILS)** – They are critical for precision approaches during landing, are unaffected by GPS spoofing.
- **Enhancing crew training** - Pilots are also encouraged to listen carefully to the control room to pick up any chatter of suspected GPS spoofing and become immediately cautious of the possibility.
- **Employing alert systems** - Involving sophisticated technology to alert and take control of the aircraft/ships from auto-pilot mode to the manual mode.
- **Effective Use of terrestrial navigation** – It involves manual position fixing using land-based aids like lighthouses and radars, the immediate alternative to maintain situational awareness.

#### What lies ahead?

- Diversifying navigation systems can be to mitigate the risks of GPS interference in the future.
- Multi-constellation Global Navigation Satellite System (GNSS) systems can be adapted to mitigate against GPS interference.

## 10.2 Prioritising Palliative Care

### Why in the News?

*On the occasion of National Doctors' Day (1st July, 2025), palliative care was given special attention.*

### What is palliative care?

- **Palliative Care** - It is a form of specialised care addressing a person's physical, emotional, social and spiritual needs.
- **Focus** - Unlike curative treatment that is aimed at eradicating disease, palliative care focuses on alleviating pain, reducing suffering, and improving quality of life — for patients and their families.
- **Aspects** - Palliative care extends beyond end-of-life support and includes pain management, psychological support, and improved quality of life at any stage of a serious illness.
- **Interdisciplinary Approach** - IT involves a team of healthcare professionals, including doctors, nurses, social workers, and chaplains, who work together to address the various needs of the patient and their family.

### What are the significances of palliative care?

- **Rise in Communicable Diseases** - The demand for palliative care is increasing constantly due to the global rise in non-communicable diseases such as cancer, diabetes and chronic respiratory conditions.

- **Reduces Pressure on Healthcare System** - India's health-care system is already strained and faces increasing pressure.
- This makes it essential to integrate palliative care to reduce unnecessary hospitalisations and ease the emotional and financial burden on families.
- **Protects Dignity** - Palliative care plays a crucial role in providing comfort and ensuring dignity to those navigating terminal conditions.

### Palliative Care Initiative in India

- **National Health Policy, 2017** – Inclusion of palliative care in the National Health Policy of 2017 in India marked a pivotal step in addressing the gap.
- **National Program for Palliative Care (NPPC)** - Launched in 2012, is a key step towards integrating palliative care into the broader healthcare system.
- **Educational Program** - The projects on pain and palliative care by the Indian Council of Medical Research and the All India Institute of Medical Sciences exemplify gradual progress in this area.
- **Neighbourhood Network in Palliative Care (NNPC) Model** - Pioneered in Kerala, it demonstrates the effectiveness of community-led initiatives, where volunteers are trained to provide support and care to those in need within their communities.

### What are the challenges in palliative care?

- **Accessibility Issue** - Access to palliative care remains uneven, especially in rural areas, and primarily among economically disadvantaged populations.
- **Underfunded** - Inadequate budget allocation for much of the activities envisaged in the palliative care policy, namely, the creation of palliative care centres in district hospitals and in tertiary referral centres.
- **Underappreciated** - According to the World Health Organization (WHO), an estimated 40 million people globally require palliative care each year, with 78% of them living in low and middle-income countries.
- However, only 14% of those in need receive such care.
- In India, where an estimated seven million to 10 million people require palliative care annually, only 1%-2% have access to it.
- **Shortage of Trained Professionals** - While India's doctor-population ratio of 1:834, surpasses the WHO recommended norm of 1:1000, the availability of medical practitioners specialising in palliative care is disproportionately low.
- **Lack of Integration with Tertiary Sector** - While palliative care is included in the primary health sector, its integration into tertiary care remains incomplete.
- **Low Public Awareness** - Public awareness of palliative care remains limited, leading to misconceptions and late-stage access to these critical services.

*Each year,  
approximately 7.2  
million Indians need  
palliative care.*

### What can be done to strengthen palliative care in India?

- The gap between demand for and availability of palliative care underscores the urgency for systemic intervention and policy prioritisation.
- **Capacity Building** - Strengthening the capacity of doctors to deliver this care, particularly in underserved regions, is imperative.
- In order to equip medical professionals with the skills and the empathy required to address end-of-life care, integrating palliative care into the core MBBS curriculum is crucial.
- **Task Shifting** - Given the limited availability of palliative care specialists, task-shifting (delegating responsibilities to trained allied health-care workers) emerges as a viable solution.
- **Empowering Existing Workforce** - India has a huge base of 34.33 lakh registered nursing personnel and 13 lakh allied health-care professionals.
- Empowering this workforce through targeted training can help bridge the gap, ensuring holistic care, particularly in rural areas and underserved regions.
- **Prudent Policy** - Policymakers must recognise the long-term benefits of investing in palliative care, from improving patient outcomes to reducing the overall burden on the health-care system.

- **Dedicated Funding** - Governments can allocate dedicated funding for palliative care programmes, ensuring that public and private health-care facilities are equipped with the necessary infrastructure.
- **Insurance Coverage** - Insurance schemes such as Ayushman Bharat should expand coverage to include palliative care, making these services more financially accessible to patients and families.
- **Inclusion of Third Sector** - Partnerships with non-governmental organisations and private institutions can also accelerate the expansion of these facilities.
- **Public Awareness Campaigns** - It can demystify palliative care and encourage early access to services.
- **The U.S. Model** - The United States has a well-established palliative care system that is driven by robust funding mechanisms, insurance coverage, and hospice care models.

### 10.3 Bio Stimulants

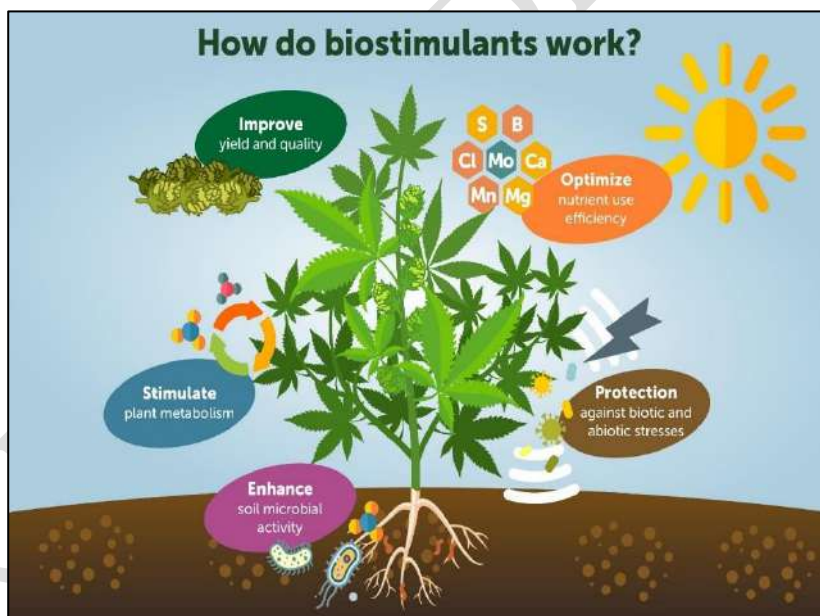
#### Why in news?

Recently, the Indian farmers has raised complaints about the inefficacy of the bio stimulants.

#### What are bio stimulants?

- **Definition** – It is a substance or microorganism or a combination of both whose primary function when applied to plants, seeds or rhizosphere is to stimulate physiological processes in plants.
- **Purpose** – It is to enhance its nutrient uptake, growth, yield, nutrition efficiency, crop quality and tolerance to stress.
- **Constituents** – Plant-derived waste materials and seaweed extracts.

**Rhizosphere** is the area around a plant root that is inhabited by a unique population of microorganisms, influenced by the chemicals released from plant roots.



#### Why they need to be regulate in India?

#### Bio Stimulant Market in India

- **Current value** - The India bio stimulants market size was valued at USD 355.53 million in 2024.
- **Future projections** - The market is projected to grow from USD 410.78 million in 2025 to USD 1,135.96 million by 2032, exhibiting a **CAGR of 15.64%** during the forecast period.
- **Absence of classification** - Bio stimulants did not fall under the existing fertilizer or pesticide categories.
- **Unregulated sale** - They were sold in the open market without government approval for a long time.
  - Around 30,000 bio stimulant products had been sold unchecked for several years in India.
- **Increased sale** - As the sale of bio stimulants increased over the years, it is high time for Centre's regulation.

**Compound Annual Growth Rate (CAGR)**, is a way to describe the average annual growth rate of an investment over a specified period.

#### How they are regulated in India?

- **Control orders** – The Fertilizer (Inorganic, Organic or Mixed) (Control) Order (FCO), 1985, regulates the manufacturing and sale of bio stimulants.
- They are issued under the Essential Commodities Act, 1955, and makes changes to it from time to time.

- In 2021, FCO was amended to include bio stimulants, paving the way for their regulated manufacturing, sale and import.
- **Judicial intervention** - In 2011, the Punjab and Haryana High Court held that ‘any manufacturer producing a bio product claiming to be a substitute for insecticides or fertilizer, but not covered under the rules, was to apply to the respective Director General of Agriculture, in the case of Haryana and Punjab.
- This paved the way for states to take samples of these products and check them before allowing their sale to farmers.
- **Frameworks** – In 2017, NITI Aayog and the Agriculture Ministry started working on a framework for bio stimulants.

### Recent Regulation Guidelines

- **Time limit for sale** - According to the FCO order, manufacturers could make and sell bio stimulants for 2 years if they made an application for provisional registration.
- **Extension of permission** – The 2 year deadline was extended continuously which allowed most of the manufacturers to continue production and selling bio stimulants.
- **Recent Extension** – In March 2025, the bio stimulants’ sale was allowed for 3 months until June 16, 2025.
- It applied to all companies manufacturing or importing a bio stimulant, for which no standards were specified.
- **Prohibition on sale** - With the March 17 notification having expired, the companies having provisional certificates and stocks of bio stimulants cannot sell their products in the market now.
- **Specifications of Bio stimulants** - Tomato, chilli, cucumber, paddy, urinal, cotton, potato, green gram, grape, hot pepper, soybean, maize, and onion.

### How did FCO regulate bio stimulants?

- **Fixing of conditions** - The inclusion of bio stimulants empowered the Central government to fix specifications.
- **Classification** – Bio stimulants specified in Schedule VI of the FCO are classified into 8 categories.
  - For example, it includes botanical extracts (as well as seaweed extracts), bio-chemicals, vitamins, and antioxidants.
- **Submission of application** – Every manufacturer or importer of a bio stimulant shall make an application to the Controller of Fertilizers along with the requisite product information.
- **Disclosure of information** - The product’s chemistry, source (natural extracts of plant/microbe/animal/synthetic), shelf-life, reports of bio-efficacy trials, and toxicity must be submitted, along with other data.

*Provisional registration is a temporary approval granted to fertilizer manufacturers or dealers, while regular registration is the long-term, permanent registration.*

5 Basic Acute Toxicity Tests	4 Eco-toxicity Tests
<ul style="list-style-type: none"> <li>• Acute oral (Rat)</li> <li>• Acute dermal (Rat)</li> <li>• Acute Inhalation (Rat)</li> <li>• Primary skin Irritation (Rabbit)</li> <li>• Eye irritation (Rabbit)</li> </ul>	<ul style="list-style-type: none"> <li>• Toxicity to birds</li> <li>• Toxicity to Fish (Freshwater)</li> <li>• Toxicity to honeybees</li> <li>• Toxicity to earthworm</li> </ul>

- **Acceptable limit** – No bio stimulant shall contain any pesticide beyond the permissible limit of 0.01 ppm (parts per million).
- **Agronomic Bio-efficiency trials** – It shall be conducted under the National Agricultural Research System, including the Indian Council of Agricultural Research and state agricultural universities.
- The trials shall be conducted at minimum 3 different doses for one season at three agro-ecological locations.
- **Central Bio stimulant Committee** – It was constituted for 5 years, with the Agriculture Commissioner as its Chairperson and 7 other members.

- It shall advise the Centre on
  - Inclusion of a new bio stimulant
  - Specifications of various bio stimulants
  - Methods of drawing of samples and its analysis
  - Minimum requirements of laboratory
  - Method of testing of bio stimulants
  - Any other matter referred to it by the central government.

#### What lies ahead?

- Institutions like the ICAR could evaluate bio stimulants to uphold the trust of farmers and ensure their technical usefulness.
- Only those bio stimulants that meet all the criteria of scientific validation and are proven beneficial to farmers could be approved.

### 10.4 NISAR Satellite

#### Why in News?

The Indian Space Research Organisation (ISRO) is planning to launch the NISAR satellite from Sriharikota on July 30 on board a GSLV Mk-II Rocket.

#### What is NISAR satellite?

- **NISAR** – It stands for **NASA-ISRO Synthetic Aperture Radar**.
- **Built by** – It is a joint mission of NASA and ISRO.
- **Launch vehicle** – GSLV Mk-II
- **GSLV Mk-II** – It is also known as LVM3 (Launch Vehicle Mark 3), a three-stage Indian launch vehicle developed by ISRO.
- **Aim** – To study changes on the earth's surface in fine detail, covering earthquakes, volcanoes, ecosystems, ice sheets, farmland, floods, and landslides.
- **Mission duration** – It is for three years.
- **Design lifetime** – At least five years.
- **Synthetic Aperture Radar (SAR)** – It is a type of radar that uses the motion of a radar antenna to create high-resolution images of the Earth's surface or other objects.
- **Aperture** – It refers to the opening used to collect radar data.
- The longer the opening, the better the radar's ability to distinguish between two closely spaced objects.
- **Radar** – It is an acronym for Radio Detection and Ranging.
- It is a system that uses radio waves to detect, locate, and track objects, as well as measure their speed and other characteristics.
- **Working of radar** – It works by transmitting radio waves and analysing the echoes that bounce back from objects in its path.

*GSLV Mk-II is designed to launch heavy satellites, particularly those weighing around 4 tons to geostationary transfer orbit (GTO) or about 10 tons to low Earth orbit (LEO).*

#### •Six goals of NISAR

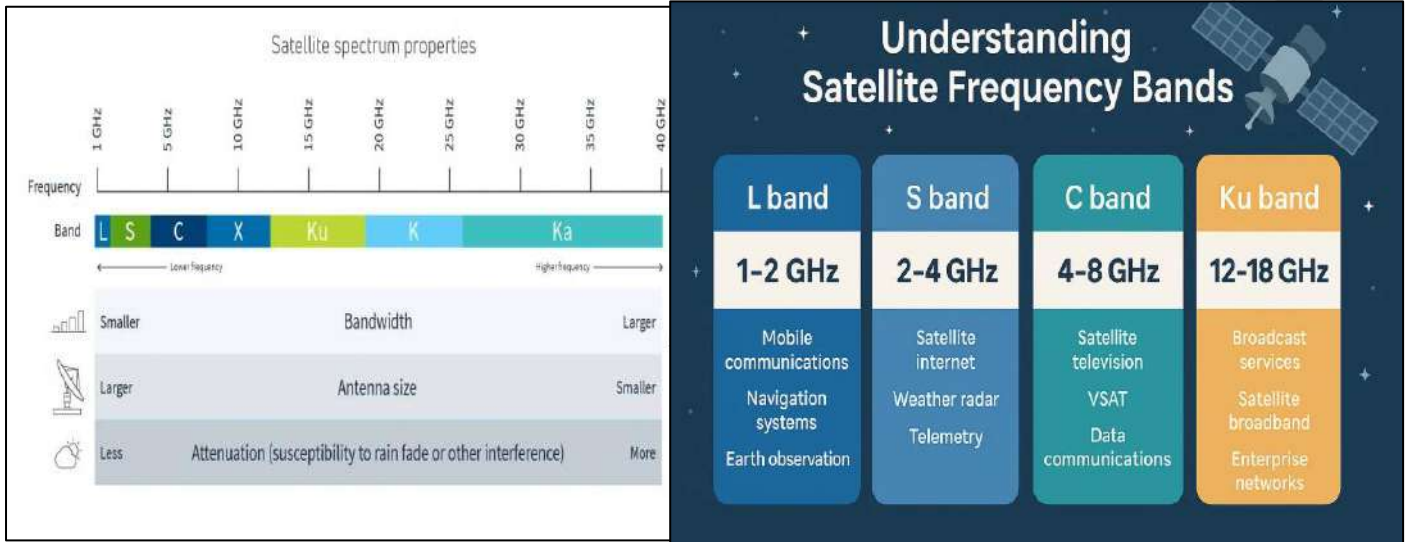
- Solid earth processes
- Ecosystems
- Ice dynamics
- Coastal and ocean processes
- Disaster response
- Additional applications – Tracking groundwater, oil reservoirs, and infrastructure like embankments, dams, and roads for subsidence or deformation and supporting food security research.

#### How was NISAR built?

- **Contribution of ISRO** – I-3K spacecraft bus, 4 kW of solar power, the entire S-band radar electronics, high-rate Ka-band, telecom subsystem.

*I-3K spacecraft bus is the platform that houses the controls to handle command and data, propulsion, and attitude.*

- A gimballed high-gain antenna, End-to-end launch services and documentation.
- **Contribution of NASA** – The complete *L-band* SAR system, all *radio-frequency electronics*, a 12-m antenna, a 9-m carbon-composite boom (the instrument structure that carries both radars).
- The supporting avionics, including a high-capacity solid-state recorder, *a GPS receiver*, an autonomous payload data system, Ka-band payload communications subsystem.
- **Combining of Parts** – The spacecraft was to be integrated at the ISRO Satellite Centre in Bengaluru after the two radars were coupled at Jet propulsion laboratory (JPL) in USA.
- **The final observatory-level tests** – It has taken place on Indian soil.
- **Mission procedures** – The mission operations are to be centred at the JPL Mission Operations Centre.



### How NISAR will be operated by US and India?

- **Flight operations** – Day-to-day flight operations will be led from the ISRO Telemetry, Tracking and Command Network in Bengaluru.
- **Transfer of data** – Most of its data will be sent through NASA’s Near-earth Network facilities in Alaska, Svalbard (Norway), and Punta Arenas (Chile).
- They can together *receive around 3 TB of radar data per day*.
- They will be complemented by ISRO’s ground stations in Shadnagar and Antarctica.
- **Processing of data** – India’s National Remote Sensing Centre will process and distribute all data required for Indian users.
- **Earmarking the S-band** – Although NISAR will operate globally at L-band, ISRO has reserved routine, planned acquisitions with the S-band SAR over India.
- The S-band acquisitions have extended sensitivity to biomass, better soil-moisture retrieval, and mitigate ionospheric noise.
- **Prominence to L-band** – Because the L-band radar is the principal tool for NASA’s mission goals, the instrument is expected to *operate in up to 70% of every orbit*.
- **Reduction of conflicts** – Operating both radars together is an *official implementation goal* so that mode conflicts over the Indian subcontinent are minimised.

### How does NISAR work?

- **Placing of satellite** – Once it is launched, NISAR will enter a sun-synchronous polar orbit.
- It will be placed at *747 km altitude and an inclination of 98.4°*.
- **Bouncing of radar waves** – From here, instead of snapping pictures, the SAR will bounce radar waves off the planet’s surface.
- It measures how long the signal takes to come back and how its phase changes.
- **Recording the echoes** – As the spacecraft moves forward, it transmits a train of radar pulses and records the echoes.

- **Combining of echoes** – A computer coherently combines all those echoes.
  - NISAR will combine an L-band SAR (1.257 GHz), which uses longer-wavelength radio waves to track changes under thick forests and soil and deformations on the ground.
  - S-band SAR (3.2 GHz), which uses shorter-wavelength radio waves to capture surface details, such as crops and water surfaces.
- **Use of different polarisation** – SAR will transmit and receive radar signals with horizontal or vertical polarisation.
- It will allow the instruments to identify the structure and types of different surface materials, like soil, snow, crop, or wood.
- **Bandwidth** – The breadth of the bands on the ground the SARs will scan, is an ultra-wide 240 km.
- **Transmission of Beam** – This scan-on-receive method allows the 240-km swath without compromising resolution.
- **Scan results** – The resulting scans will have a spatial resolution of 3-10 m and centimetre-scale vertical mapping.
- **Operational extent** – Each spot on the ground will be scanned once every 12 days.

*Polarisation is the direction in which the electric field of some electromagnetic radiation, like radio waves, oscillates.*

#### What are the significances of NISAR?

- **Dual band radar** – It is the first major earth-observing mission with a dual-band radar.
- It will allow to observe changes more precisely than any other satellite.
- **All weather usage** – It will be able to see through clouds, smoke, and even thick vegetation, both at day and night.
- **Descriptions of climate changes** – It provide critical information by taking snapshots of the constantly changing earth's surface.
- **Periodical maps** – It will produce annual maps of aboveground woody biomass of 1 ha resolution.
- It will also produce quarterly maps of active and inactive cropland.
- High-resolution maps of flooded versus dry areas will be available.
- **Proxy maps data** – It can also collect data for damage proxy maps during disasters.
  - The maps will be delivered within five hours.
- **Free availability of data** – The data will be freely available to all users.

#### Limitations of NISAR

- For certain acquisition modes, NISAR won't be able to achieve full global coverage at the highest resolution.
- Above roughly 60° latitude, every alternative observation will be skipped due to converging ground tracks.
- Some, 10% of the surface may not be mapped from either direction of the satellite's passage over the ground in any given 12-day cycle.

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