

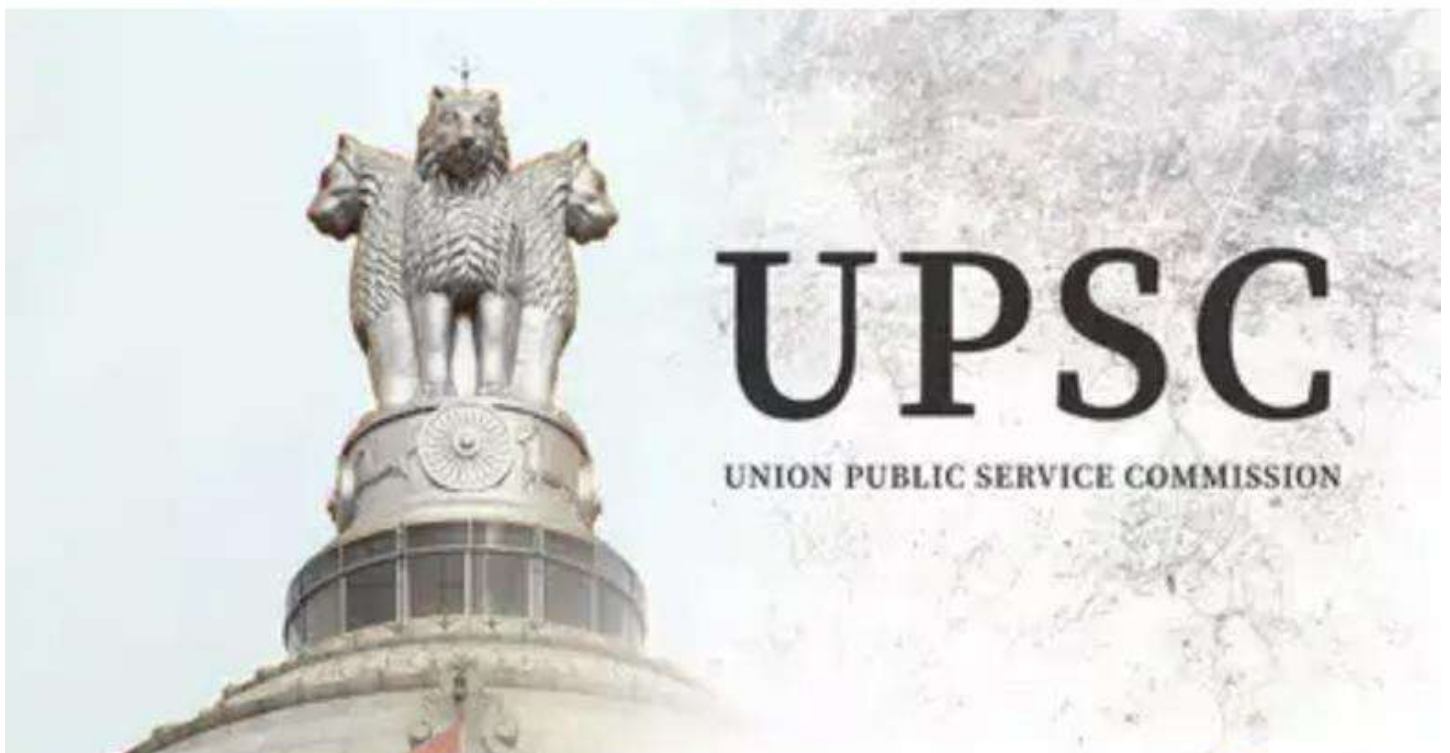


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November 2025

1. IMPORTANT TOPICS OF THE MONTH

1.1 Nomination Process for Election – Need for Reform

Recently there were many instances of the rejection of nomination papers filed by the candidates, which raises the question of inclusivity of the election process.

What are the procedures for nomination?

- **Legal framework** – The Representation of the People Act (RP), 1951, particularly Sections 33 to 36, and the Conduct of Elections Rules, 1961, govern the nomination process.
- **Section 33** – Prescribes who may file nominations.
- **Section 34** – Provides for security deposits
- **Section 36** – Authorises the RO to scrutinise nominations and reject those deemed invalid.
- **Section 36(2)** – The RO's power to conduct a "summary inquiry" and to reject nominations for "defects of a substantial character".
- It is extraordinarily wide, and largely un-reviewable before polling, since Article 329 (b) bars courts from interfering mid-election.
- India's electoral nomination process vests extraordinary discretion in a single official – the Returning Officer (RO).

What are the issues and procedural traps?

- **The problem with verification** – Section 36 of the RP Act mandates that only qualified candidates can contest.
- However, the process of verifying qualification has accumulated complexity over the years.
- **Judicial interventions** – Well-intended judicial interventions have paradoxically worsened the problem.
- Supreme Court directions mandating detailed affidavits on assets, liabilities, and criminal cases were meant to ensure transparency, yet each new disclosure requirement added another opportunity for technical rejection.
 - **For example**, in *Resurgence India versus Election Commission* (2013), the Supreme Court held that false declarations lead to prosecution but don't invalidate nominations, only incomplete ones do.
- This means that a candidate who lies but fills all columns stays on the ballot, and one who makes a good-faith error can be rejected.
- **Instances of incomplete application** – The system now punishes incomplete declarations more harshly than dishonest ones.
 - A missing signature,
 - A mismatched electoral number,
 - A form filed at 3:05 PM instead of 3:00 PM,
 - A blank column in an affidavit,
 - A delayed oath,
 - A missing no-dues certificate
- Any of these can end a candidacy.
- The burden of proof thus lies entirely on the citizen seeking to exercise a legal right, and not on the official denying it and this is constitutionally backwards.
- The right to be voted for is the necessary twin of the right to vote.
- Without candidates to choose from, the ballot is ritual without substance.
- The first principle must be that every qualified citizen has a presumptive right to contest.
- That right can be denied only when the RO establishes, with clear evidence, a substantive constitutional or statutory disqualification.

- Technical paperwork errors cannot be a reason for disqualification.
- Some of the common procedural technicalities on which nominations are rejected include:
- **The oath trap** – Every candidate must take an oath before a specified authority after filing nomination but before scrutiny. If it's too early, it's invalid, and if too late, the nomination is rejected.
- Moreover, if it is not before the specified authority, your form is again bound to be rejected.
- **The treasury trap** – Security deposits must be made in cash or through treasury challans.
- A candidate arriving after 3 PM with the correct amount but wrong payment mode can be disqualified.
- Security deposit submissions can be made more citizen friendly by including payment modes such as UPI, RTGS, or debit card.
- **The notarisation trap** – Every Form 26 affidavit (an affidavit which needs to be filed by the candidate along with nomination papers) must be notarised by a specified authority.
- Not having done so can result in rejection of the nomination.
- **The certificate trap** – Along with nomination papers, the candidate is liable to submit:
 - No-dues certificates from municipal bodies, electricity boards, or other government departments,
 - Clearance certificates from the Election Commission for government servants,
 - Various other bureaucratic attestations,
- Each of them a veto point when it comes to the time of scrutiny.
- Thus, each issuing office becomes a potential chokepoint where deliberate delay can eliminate a candidacy.
- These procedures, once designed as safeguards, have turned into potential opportunities for delay and manipulation.
- Here, bureaucratic compliance is being rewarded over democratic legitimacy.
- The current system is not rule-based, it is ruler-based..
- **Rights violated** – When a nomination is rejected arbitrarily, two rights are violated:
 - The candidate's right to contest
 - The voters' right to choose.
- **Issues with the checklist system** – The RO Handbook instructs ROs to point out defects at the time of filing and record them in a checklist.
 - But this checklist has no legal standing.
 - The Handbook itself clarifies that the checklist "will not prevent the Returning Officer from pointing out other defects, if any, discovered later during scrutiny."
 - A nomination can be marked defect-free at filing, yet rejected at scrutiny for defects the RO discovers later.
 - The candidate has no right to rely on the checklist, and the RO faces no legal obligation to honour it.
 - The checklist thus remains as an illusion of transparency without offering any real protection to the candidate.
- **Absence of guidelines** – The law says no nomination should be rejected for defects not of a substantial character.
 - But there are no written guidelines on what is substantial.
 - And the only remedy to protest it is an election petition after the polls, when the damage is irreversible.
 - In a democracy, this absolutism dressed in legal language has the potential to become a tool of political exclusion.
- **Instances of rejections of nomination** – In Bihar this year, a Rashtriya Janata Dal (RJD) candidate's nomination was rejected for leaving some fields blank.
 - Last year in Surat, Opposition candidates were eliminated after proposers denied signatures, delivering a Lok Sabha seat unopposed.

- In the 2019 elections in Varanasi, decorated BSF jawan Tej Bahadur Yadav was rejected because he could not obtain an Election Commission certificate overnight.
- In Birbhum, former IPS officer Debasish Dhar was kept off the ballot when his no-dues certificate from the government was delayed.
- Sikkim's first Lok Sabha election in 1977, every candidate but one failed to take the constitutional oath before scrutiny, resulting in a one-man contest.
- This is where the procedure becomes politics.
- **Lack of transparency** – There is no publicly available consolidated dataset on rejection grounds, patterns, or party-wise breakdowns.
- This opacity shields the weaponisation of procedure.

What are the approaches in other countries?

- **Best practices** – Other democracies show a different approach.
 - In, U.K, the ROs *help candidates* fix errors before deadlines.
 - Canada mandates a *48-hour correction period*.
 - Germany *requires written notice of problems*, time to remedy them, and multiple appeal layers.
 - Australia encourages *early submission* to allow corrections.
- The common idea being that election officials are facilitators, not sentinels.
- Their job is to widen participation, not narrow it.

What should be done?

- **Shift in RO's role** – The RO's role must shift from discretion to duty.
- When a deficiency exists, the RO must issue a detailed written notice specifying the exact error, the legal provision violated, and the correction needed.
- **Extension of correction period** – Candidates must get a guaranteed 48-hour window to fix it after receiving this notice.
- The law must thus classify deficiencies into 3 categories:
- **Technical or paperwork defects** – It includes issues such as missing signatures, blank affidavit columns, clerical errors, no-dues certificates etc.
 - These cannot justify rejection.
- **Matters requiring verification of authenticity** – It has issues such as disputed signatures, challenged documents etc.
 - These require investigations before rejection.
- **Constitutional and statutory bars** – These should lead to immediate and absolute disqualification.
- Moreover, every rejection order must be reasoned.
- The RO must specify which exact requirement was not met, which provision of law was violated, what evidence supports the finding, and why the defect is substantial enough to justify rejection.
- **Digital solution** – The Election Commission of India (EC) can build a nomination system that is digital-by-default, one that doesn't depend on excessive paperwork.
- A digital-by-default framework that can eliminate disqualifications based on blank columns and misspelt names or typos.
- The entire nomination process could move to an integrated online portal linked with the electoral roll.
- The system could automatically validate voter ID, age, and constituency details.
- Oath, affidavit submission, proposer verification, and deposit payment could all be digital.
- **Dedicated dashboard** – Every nomination's progress such as when it was filed, verified, deficiency notified, corrected, accepted or rejected, should be visible on a public dashboard with timestamps and reasons.

What lies ahead?

- The world's largest democracy deserves a nomination process that is modern, fair, and inclusive, where the burden of proof is on the state to justify exclusion, not on citizens to prove their right to participate.
- Fairness must extend to the nomination stage, where the voter's right to choose is determined.
- The EC should work towards a citizen-friendly nomination process that would end the bureaucratic red tape around disqualifications for blank columns, wrong payment modes, misplaced signatures, misspelt names and typos, no dues certificates or a delayed oath.
- It should work towards a simplified process that removes the possibility of using procedure as politics.

1.2 Functional Foods and Smart Proteins – The Future of Nutritional Security in India

Food and nutrition have always been central to human development, but society's relationship with food has evolved dramatically over time and the concept of functional foods and smart proteins gained attention recently.

What are functional foods?

- **Functional foods** – It refers to foods that are enriched, fortified, or modified to provide additional health benefits beyond basic nutrition.
- They are not just sources of calories but are designed to promote physical well-being and reduce the risk of lifestyle diseases.
 - **For example**, Rice enriched with vitamins helps tackle micronutrient deficiencies.
- Milk fortified with omega-3 fatty acids supports heart and brain health.
- **Supportive technologies** – These foods are made possible due to the advancement of several scientific disciplines and technologies such as:
 - **Nutrigenomics** – It studies how nutrients interact with genes.
 - This allows the possibility of designing diet plans and foods that are suited to the genetic profile or disease risk of specific individuals or populations.
 - **Bio-fortification** – It is where the nutrient content of crops is improved through selective breeding or biotechnology.
 - Unlike conventional fortification, which adds nutrients during processing, bio-fortification enhances nutritional value at the crop growth stage itself.
 - **3D Food Printing** – It uses customised nutritional formulations to create food with controlled nutrient distribution.
 - **Bioprocessing** – It is where biological systems are used to enhance nutrient bioavailability, improve digestibility, or reduce anti-nutritional factors.
 - Thus, functional foods are not just diet supplements, but they are part of a strategy to integrate nutrition into everyday eating patterns.

What are smart proteins?

- **Smart proteins** – They represent an innovative category of proteins developed using biotechnology to reduce reliance on conventional protein production from livestock.
- They are called "smart" because they offer a sustainable and ethical method of producing nutrient-rich foods with lower environmental impact.
- **Major forms** – They exist in 3 major forms
 - **Plant-based proteins** – These are extracts from cereals, legumes, and oilseeds that are processed and restructured to mimic animal-based products such as meat, milk, and eggs.
 - This allows consumers to enjoy familiar textures while reducing animal consumption.
 - **Fermentation-derived proteins** – Microorganisms are used to produce specific proteins through fermentation.
 - These can replicate components found in dairy or meat, such as casein and whey, without involving animals.
 - **Cultivated meat** – It is also called cell-based meat, this is produced by growing animal cells in controlled bioreactors.

- This allows the creation of real meat without slaughtering animals.

Smart proteins allow us to produce high-quality protein foods with a much lower land, water, and carbon footprint compared to traditional livestock farming.

Why India needs functional foods and smart proteins?

- **Prevailing nutritional deficiency** – Despite having self-sufficiency in food production, a large portion of the population suffers from nutritional deficiencies.
- Over one-third of Indian children are stunted, indicating chronic malnutrition.
- **Urban-Rural Gap** – Although adult protein consumption is improving, the gap between urban and rural protein intake remains wide.
- Shifting food preferences – As incomes rise and people become more health conscious, the public expectation from food is shifting.
- Food can no longer be evaluated only on calorie content, it must contribute to improved health and wellness.
- India therefore needs to transition from **food security**, which focuses on filling stomachs, to **nutritional security**, which focuses on nourishing bodies.
- **Environmental challenges** – Meeting protein and micronutrient needs through conventional livestock-based systems leads to higher greenhouse gas emissions, excessive land use, water depletion, and biodiversity loss.
- Smart proteins offer a solution, they allow us to meet rising protein demand while lowering environmental impact.

What is the current status of India?

- **Officially recognized** – Functional foods and smart proteins are officially acknowledged as thematic focus areas under the Biotechnology for Economy, Environment, and Employment (BioE3) policy.
- **Funding and innovations** – The Department of Biotechnology (DBT) along with the Biotechnology Industry Research Assistance Council (BIRAC) has launched funding programmes and innovation challenges dedicated to these domains.
- **Progress in Functional Foods** – Indian scientists are actively developing bio-fortified crops.
- Zinc-enriched rice has been developed at the Indian Institute of Rice Research (IIRR) in Hyderabad.
- Iron-rich pearl millet has been developed at ICRISAT.
- These crops are particularly relevant for a population vulnerable to micronutrient deficiencies.
- The private sector is also expanding its footprint.
- Companies such as Tata Consumer Products, ITC, and Marico are investing in fortified staples and health-focused food products.
- This indicates that functional foods are moving beyond experimentation and into mainstream markets.
- **Progress in Smart Proteins** – India's smart protein ecosystem is growing rapidly.

Global Experiences	
Japan	It conceptualised functional foods as early as the 1980s and developed regulatory frameworks that enabled their commercial rollout.
Singapore	It became the first country in the world to approve commercial sale of cultivated chicken in 2020, demonstrating regulatory agility
The European Union	It is investing strongly in sustainable protein production as part of its “Farm to Fork” environmental strategy.
China	It views alternative proteins as a strategic priority within its food security and innovation policies.

- By 2023, India had around 377 alternative meat, egg, and dairy products being sold by over 70 brands.

- Startups like GoodDot, Blue Tribe Foods, and Evo Foods are producing plant-based meat and eggs that cater to increasing consumer interest.
- Zydus LifeSciences entered the smart protein segment in 2024 by acquiring a 50% stake in Sterling Biotech, signalling corporate interest in fermentation-based protein.
- The Centre for Cellular and Molecular Biology received a ₹4.5 crore DBT grant for research on cultivated meat.
- India can learn from these approaches to create a supportive policy environment.

What are the underlying challenges?

- **Lack of regulation** – The Food Safety and Standards Authority of India (FSSAI) has not yet issued clear regulations on the approval process, labelling, or safety evaluation of new food categories such as cultivated meat and precision-fermented proteins.
- **Limited arrangements** – Infrastructure for fermentation, quality certification, and consumer testing is still limited, restricting commercial scaling.

What should be done?

- **Regulatory framework** – Establishing a national regulatory framework under FSSAI for novel foods, with clear definitions, safety protocols, and labelling standards.
- **Coordination** – Ensuring inter-ministerial coordination so that agricultural, biotechnology, and food safety bodies work in alignment.
- **PPP** – Encouraging public-private partnerships (PPP) to scale biomanufacturing infrastructure and indigenise key technologies such as precision fermentation.
- **Inclusion** – Involving farmers and rural communities in new value chains to ensure equitable benefits.
- **Campaigns** – Conducting public education campaigns to build trust and address concerns about "lab-made" foods.

What lies ahead?

- Functional foods and smart proteins represent a significant leap in India's journey toward *nutritional security*.
- They offer a means to combat malnutrition, improve health outcomes, generate employment, and support environmental sustainability.
- The challenge now is not technological but regulatory and institutional. India must act quickly to build trust, strengthen policy frameworks, and scale manufacturing capacity.
- If implemented effectively, this nutrition and biotechnology revolution can help India move from merely feeding its population to **nourishing** it, setting the stage for healthier citizens and a more sustainable future.
- Economically, the global plant-based foods market is expected to reach between \$85 billion (UBS estimate) and \$240 billion (Credit Suisse estimate) by 2030.
- India, with its agricultural diversity and biotechnology capacity, could become a global supplier and generate vast employment opportunities in agriculture, processing, manufacturing, and logistics.
- Environmentally, smart proteins could significantly reduce emissions, land degradation, and water stress.

G.S PAPER I

2. HISTORY

2.1 India's Folk Traditions at IFFI

Recently, Day 3 of the International Film Festival of India (IFFI) 2025 transformed the INOX venue in Panaji, Goa, into a vibrant showcase of the nation's diverse performance arts.

What is the International Film Festival of India (IFFI)?

- **Origin** – Born in 1952, the International Film Festival of India (IFFI) stands tall as South Asia's oldest and largest celebration of cinema.

- **Host** – Jointly hosted by
 - The National Film Development Corporation (NFDC).
 - Ministry of Information and Broadcasting, Government of India.
 - The Entertainment Society of Goa (ESG).
 - State Government of Goa.
- **Significance** – The festival has grown into a global cinematic powerhouse—where restored classics meet bold experiments, and legendary maestros share space with fearless first-timers.
- What makes IFFI truly sparkle is its electric mix—international competitions, cultural showcases, masterclasses, tributes, and the high-energy WAVES Film Bazaar, where ideas, deals and collaborations take flight.
- **56th edition** – Staged against Goa’s stunning coastal backdrop from November 20–28.
- The 56th edition promises a dazzling spectrum of languages, genres, innovations, and voices—an immersive celebration of India’s creative brilliance on the world stage

What are the traditional performances that took place?

- **Gussadi (Telangana)** – Gussadi is a vibrant folk dance from *the Gond tribe* in Telangana, performed during the Dandari festival which coincides with Diwali.
- The *male-only dancers* wear elaborate costumes, including colorful clothes, peacock feather turbans, and deer antlers, and perform energetic routines to traditional instruments like the dappu and tudumu.
- **Mahishasura Mardini (West Bengal)** – It is a *dramatic folk play-dance*, offering a powerful depiction of good triumphing over evil.
- The performance vividly recreated the epic battle between Goddess Durga and the demon Mahishasura, complete with appearances by other major deities and striking martial choreography inherent to the Chhau style
- Mahishasura Mardini in West Bengal most commonly refers to the Mahishamardini Shakti Peeth in Bakreshwar, a sacred site dedicated to the goddess who slays the demon Mahishasura.
- It also refers to the famous Durga Puja festival, where a central image is the deity Mahishasura Mardini (a form of Durga), a tradition deeply ingrained in the state's culture.
- **Sambalpuri Chutkuchuta (Odisha)** – Chutkuchuta" in Odisha can refer to a traditional folk dance, an album of songs, or a restaurant.
- Sambalpuri Chutkuchuta is an energetic folk dance from the Sambalpur region of Odisha, while "Chutku Chuta" and "Chutkuchuta" are also the titles of popular Odia music albums.
- Additionally, "Hotel Chutkuchuta" is a specific hotel in Odisha.
- **Tarpa Dance (Daman and Diu/Maharashtra)** – Tarpa Dance is a tribal folk dance originating from tribes in Maharashtra, Dadra and Nagar Haveli, and Daman and Diu.
- It is characterized by performers dancing in a circle to the music of a *wind instrument also called a "tarpa"*.
- The dance is performed during celebrations like harvests, marriages, and childbirths, often on moonlit nights.
- The dancers form a spiral or circle, and others can join in, with the musician staying inside the circle
- **Chari Dance (Rajasthan)** – The Chari dance is a traditional folk dance from Rajasthan, India, performed by women, particularly from *the Kanjar and Gurjar communities*.
- Dancers balance brass pots on their heads while performing graceful movements and twirls.
- The dance symbolizes the hard work of women collecting water and is performed at festivals and celebrations, with the pots sometimes carrying flaming lamps to create a fire effect.
- **Lavani (Maharashtra)** – Lavani is a traditional folk dance form of Maharashtra, known for its energetic blend of song, dance, and theatrics.
- Originating around the 16th or 18th century, it is performed by women dancers wearing nine-yard sarees and ghungroos to the rhythmic beats of instruments like the dholki.
- The name "Lavani" comes from the Marathi word "lavanya," meaning "beauty".
- **Ram Vandana (Assam)** – Ram Vandana" in Assam refers to a part of the Sattriya classical dance form originating from the Majuli island.

- It is a devotional performance that can be a segment in a larger play, such as the 15th-century "Ram Vijay" by Shrimant Shankardev, and features the graceful and refined movements characteristic of Sattriya dance.
- **Bihu (Assam)** – Bihu is the most important festival in Assam, celebrated three times a year, with the most popular being Rongali Bihu (or Bohag Bihu) in April, which marks the Assamese New Year and the start of spring.
- The festival celebrates life, unity, and gratitude through traditional music, the famous Bihu dance, community feasts, and various cultural events.
- The other two Bihu festivals are Bhogali Bihu in January, celebrating the harvest, and Kati Bihu in October, which focuses on the new paddy crop.

3. GEOGRAPHY

3.1 Local Topography and its Contribution to Air pollution

Recently, the air quality in Delhi slips into the "very poor" category, slow winds and dipping temperatures are further expected to push the capital towards an air emergency.

How south Asia acts as a global hotspot for air pollution?

- **Report** – According to the 2024 World Air Quality report, published by IQAir, India ranked the fifth most polluted country with an average PM_{2.5} concentration of 50.6 µg/m³.
- **Most polluted countries** – Countries with higher pollution levels included
 - Chad (91.8 µg/m³),
 - Bangladesh (78.0 µg/m³),
 - Pakistan (73.7 µg/m³), and
 - The Democratic Republic of Congo (58.2 µg/m³).
 - Tajikistan and Nepal ranked 6th and 7th, respectively.
- This suggests that South Asia has become a global hotspot for air pollution, with many cities recording high AQIs (Air quality index), particularly during the winter months.
- **Status of India** – India's capital continues to grapple with worsening air pollution that has remained either in the 'severe' or 'very poor' category for several days now.
- On Monday (November 3), the PM_{2.5} concentration was measured at 168 µg/m³, far exceeding the World Health Organization (WHO) limit of 15 µg/m³ for 24 hours.
- Moreover, air pollution can travel long distances and is therefore transboundary in nature.
- **Airsheds** – The World Bank has identified 6 'airsheds' in and around India, characterised by geographical and climatic factors through which the pollutants move.
- These airsheds are:
 - **West/Central Indo-Gangetic Plain** – Punjab (Pakistan), Punjab (India), Haryana, parts of Rajasthan, Chandigarh, Delhi, and Uttar Pradesh.
 - **Central/Eastern Indo-Gangetic Plain** – Bihar, West Bengal, Jharkhand, and Bangladesh.
 - **Middle India 1** – Odisha and Chhattisgarh.
 - **Middle India 2** – Eastern Gujarat and western Maharashtra.
 - **Northern/Central Indus River Plains** – Pakistan and parts of Afghanistan.
 - **Southern Indus Plain and further west** – Southern Pakistan and western Afghanistan, extending into the eastern portion of Iran.
- **Movement of pollutants** – During winters, when the wind moves from northwest to the southeast, pollutants also move across borders from Pakistan's Punjab to the Indian state of Punjab.

IQAir is a Swiss company that creates a range of products for air quality management, including high-efficiency air purifiers with HyperHEPA technology and a global air quality monitoring platform called AirVisual.

New Delhi was ranked the most polluted capital city, while 13 other Indian cities were among the top 20 most polluted cities worldwide.

- Similarly, many cities in Bangladesh witness pollution that originated from India.

How local topography determines air quality?

- **Location** – Delhi lies in a bowl-shaped area within the Indo-Gangetic plains (IGP), bounded by the Himalayas to the north, the Aravalli hills to the south-west, and the Malwa and Deccan plateaus to the south.
- Such topography makes it harder for pollutants to disperse.
- The Himalayas block the northward dispersal of heavy and polluted winter air, forcing it to travel eastward across the northern plains before reaching the Bay of Bengal.
- **Role of monsoon** – Post-monsoon air is characterised by lower moisture levels, decreased temperatures and reduced wind speeds.
- During this time, pollutants are trapped near the ground, reducing their ‘mixing height’, the height up to which pollutants can disperse.
- During winters, temperature inversion conditions are also witnessed, when a layer of warm air sits over cold air and fog.
- This fog, when combined with the pollutants, becomes smog that further reduces visibility creates a phenomenon also referred to as Turbidity Island effect.
- **Seasonal factors** – Agricultural stubble burning and firecrackers during festivals, further exacerbate the already degraded air quality.
- **Persistent factors** – Year-round drivers of air pollution include
 - Coal and biomass burning
 - Vehicular emissions
 - Industrial pollution
 - Brick kilns
 - Improper waste management,
 - Unregulated construction dust,
 - Deforestation and transboundary pollution.
- These sources of pollution also contribute to the public health crisis.

Why there is an urgent need to address air pollution?

- **Important factor of mortality** – According to the WHO, 99% of the global population lives in areas that do not meet recommended air quality standards.
- **Effect on India** – The recently published Lancet Countdown on Health and Climate Change report estimates that in India 1.7 million deaths were caused by anthropogenic PM_{2.5} pollution in 2022, a 38% increase since 2010.
- The economic cost of these premature deaths stands at USD 339.4 billion, which translates to 9.5 per cent of the country’s GDP.
- Notably, the Indo-Gangetic Plains are one of the most densely populated regions in the world.
- And Delhi’s air quality fluctuates during winter, ranging between poor (201-300), very poor (301-400), severe (401-500), and sometimes even exceeding these levels.
- **Health issues** – Exposure to hazardous air exacerbates various health issues, including respiratory disorders like asthma and Chronic Obstructive Pulmonary Disease (COPD).
- Other issues include lung diseases, immune disorders, and cardiovascular diseases and sometimes even neurodevelopmental and mental health disorders and reduced cognitive development in children.
- **Effect on children** – Children have a relatively higher respiratory rate and breathe more air per unit of body weight than adults, which makes them more vulnerable than adults when exposed to the same environment.
- This increases the cost of healthcare, further hindering the country’s productive capacity.
- It underlines the urgent need to tackle air pollution.

Air pollution is now **the second leading risk factor** for death globally.

United Nations General Assembly declared access to a clean, healthy and sustainable environment, a universal human right.

What are the policy and technological responses?

- **GRAP** – Stage II of the Graded Response Action Plan (GRAP) to control air pollution is in force in Delhi.
- The GRAP, prepared in 2016, provides a framework for implementing targeted interventions under different AQI categories.
- **Scrapping of old vehicles** – In addition, the policy mandating the scrapping of 15-year-old petrol vehicles and 10-year-old diesel vehicles (originally directed by the National Green Tribunal in 2015) is now pending before the Supreme Court, awaiting a final verdict.
- **National Clean Air Programme (NCAP)** – It was launched in January 2019, aims to improve air quality in 131 cities through comprehensive monitoring, sectoral emission reductions, and public awareness initiatives.
- **Other measures** – The government has also introduced measures such as anti-smog guns, smog towers, a pilot cloud-seeding project, and curbs on the entry of commercial vehicles running BS III and BS IV engines.

What are the challenges?

- **Limitations of technology** – Measures such as anti-smog guns and smog towers have shown limited effectiveness.
 - For example, Cloud-seeding requires specific meteorological conditions, involves high costs, and covers a limited area, making it unsustainable for addressing current challenges.
- The unsuccessful attempt last month by the Delhi government in collaboration with IIT Kanpur demonstrates the limitations of such short-term, reactive approaches in addressing air pollution challenges.
- **Relaxing of crackers ban** – This year during Diwali, the Supreme Court also partially relaxed the total ban on firecrackers and allowed government-approved green crackers on a test case basis.
- However, the Delhi-NCR region recorded an AQI in the very poor to severe categories the morning after Diwali.
- **Missing of data** – Data from 28 of 39 functioning monitoring stations went missing during the Diwali night, indicating a serious data gap.
- Such instances highlight the need for a more proactive and even rights-based approach to tackle air pollution.

What lies ahead?

- The persistent exceeding of breathable air quality limits presents a serious public health emergency that demands a shift in approach from reactive to preventive strategies.
- It requires countries across South Asia to make coordinated, region-wide, broader policy frameworks.
- This can then be moulded to suit local and specific conditions where needed.
- There is also a need to invest more in clean public transport, cycling and pedestrian infrastructure.
- Coordinated policies for cleaner transportation, improved construction practices, increased renewable energy adoption, sustainable agriculture methods to reduce stubble burning, stricter emission controls, and their proper implementation are necessary.
- These measures are critical for protecting public health, sustaining economic growth, ensuring overall productivity and improving the quality of life.

4. SOCIAL ISSUES

4.1 Eradication of Extreme Poverty – The Kerala Model

Recently, The Chief Minister of Kerala, Pinarayi Vijayan declared that Kerala has eradicated extreme poverty, making it the first Indian state to achieve this milestone.

What is extreme poverty?

- **Definition** – As per the World Bank's (June 2025) revision, anyone living on less than \$3 per day (2021 PPP) is considered to be in extreme poverty.
- Earlier, the benchmark was \$2.15/day (2017 PPP).
- **The poverty line determination:**

- Lower-middle-income countries – \$4.20/day
- Upper-middle-income countries – \$8.30/day
- **Poverty and extreme poverty:**
 - Those earning below \$4.20 but above \$3 are poor, not extremely poor.
 - Extreme poverty captures the most deprived segment in terms of basic human needs like food, shelter, health, and education.

What is India's position in the global context?

- **World Bank estimates (2025)** – In India 838 million people globally lived in extreme poverty in 2022 (using \$3/day standard).
- **Reduction of Extreme poverty** – It declined from 16.2% (2011–12) to 2.3% (2022–23).
- About 171 million people were lifted out of extreme poverty.
- **Drivers of progress** – The rising employment and urbanization has been the main drivers of extreme poverty reduction.
 - For example, urban unemployment reduced to 6.6% (Q1 FY24/25) – lowest since 2017–18.
- **Challenges** – The poverty reduction efforts of India suffers from following challenges
 - **Unemployment** – It remains as the persistent challenge.
 - Youth unemployment which stands at 13.3% (29% among graduates).
 - **Disparity** – Female employment rate stands only at 31%.
 - **Informal work nature** – 77% of non-farm jobs and most farm jobs remain informal.
- Critics argue that official poverty reduction estimates may not fully capture multidimensional deprivations.
- **Multidimensional Poverty Index (MPI)** – It is based on Alkire-Foster methodology (Global MPI), and uses 12 indicators across 3 dimensions
 - **Health** – Nutrition, child mortality, maternal health.
 - **Education** – Years of schooling, school attendance.
 - **Standard of living** – Housing, sanitation, assets, and cooking fuel.

What is the journey of Kerala in Eradicating poverty?

- **MPI 2021** – Kerala's poverty rate was 0.7% which was the lowest in India.
- **Decline of Poverty** – It declined from 59.8% in the 1970s to near zero due to successive governments' welfare policies in education, health, and social security.
- However, Kerala's extreme poverty identification method differed from the NITI Aayog's MPI framework.
- **4 year effort** – The achievement follows a targeted four-year effort under the Extreme Poverty Eradication Programme (EPEP) led by the Left Democratic Front (LDF) government.
- This marks a significant development in India's poverty alleviation journey, offering insights into localized, data-driven, participatory governance models, and aligning with UN Sustainable Development Goal.

What is the extreme poverty eradication programme (epep) of kerala?

- **Launched in** – Announced in 2021.
- **Nodal agency** – The Local Self-Government Department was the nodal agency.
- **Skilled man power** – Around 4 lakh, officials, elected representatives, and volunteers were trained.
- **Identification process** – 1.18 lakh families were initially identified.
- **Criteria** – Income, health, housing, and food insecurity.
- **Key interventions** – Housing: 4,677 homeless families identified, and 4,005 were provided homes under Life Mission Scheme.
- **Food security** – 20,648 families lacking stable food access were given meals by local bodies.
- **Essential services** – Under Avakasam Athivegam (Rights Fast) campaign, families were ensured access to Aadhaar, voter ID, bank accounts, MGNREGS job cards, social pensions, electricity, and LPG connections.

- **Institutional collaboration** – Local governance, community participation, and data verification ensured inclusivity.
- **Political backing and support** – Opposition parties also extended support for the programme.

What are the remaining challenges for Kerala?

- **Tribal representation concerns** – Adivasi Gothra Mahasabha alleged that only 5% of identified families were Scheduled Tribes.
- There is a high deprivation among Paniya, Adiya, and Kattunaikkar communities in Wayanad and Attappady.
- Criticism of survey methodology for not ensuring tribal-specific inclusion parameters.
- **Labour and welfare gaps** – ASHA workers criticized the government's poverty claims, demanding better payment (rupees 223/day).
- The government responded by increasing their pay by Rupees 1,000/month.
- **Sustainability challenge** – LSGD is now planning Phase II to ensure beneficiaries do not revert into poverty, focusing on long-term livelihood stability.

What lies ahead?

- Kerala's EPEP marks a milestone in India's fight against extreme poverty – showcasing how decentralised governance, human-centric micro-planning, and participatory implementation can transform lives.
- While political criticism and inclusivity gaps persist, the model provides a replicable framework for sustainable and equitable poverty eradication in India.
- By blending welfare delivery with dignity and empowerment, Kerala reaffirms its place as a social development pioneer.

4.2 Elimination of Violence against Women

Recently, the International Day for the Elimination of Violence against Women November 25 was celebrated and it carries profound resonance globally.

What is the International Day for the Elimination of Violence against Women?

- **Established by** – The United Nations General Assembly in 2000.
- **Significance** – This day marks the start of the global *16 Days of Activism against Gender-Based Violence* from November 25 to December 10.
- **2025 Theme** – For 2025, the global theme is *UNiTE to End Digital Violence against All Women and Girls*.
- **Digital violence faced by women** – From online harassment and cyberstalking to deepfakes, cyberstalking, doxxing, and coordinated misogynistic attacks, technology-facilitated gender-based violence has emerged as a disturbing new form of abuse.

What are the institutional and legal measure taken by India to End Violence against Women?

- **National Commission for Women (NCW)** – This Commission was established as a *statutory body* by the Government of India on January 31, 1992.
- It works with the mandate to examine and monitor all constitutional and legal safeguards for women, recommend amendments to existing laws wherever required, and investigate complaints related to the deprivation of women's rights.
- **State commissions for women** – Most states have also constituted State Commissions for Women (SCWs) with parallel responsibilities.
- The NCW receives complaints of violence and rights violations against women, both in writing and online.
 - **Helplines** – Furthermore, the National Commission for Women (NCW) launched Helpline number(s) for reporting of domestic violence incidences.
 - One such helpline number is *7827170170 to provide 24x7* online support to women in distress through referral by linking them with Police, Hospitals, District Legal Services Authority, psychological counsellors etc.
- The portal is driven by Interactive Voice Response (IVR) mechanism through Digital India, in collaboration with Ministry of Electronics and Information Technology.

- **Bharatiya Nyaya Sanhita, 2023** – This replaces the Indian Penal Code (IPC) and introduces stringent penalties for sexual offenses, including the life imprisonment for rape of minors under 18 years.
- It *expands definitions of sexual offenses*, mandates audio-video recording of victim statements, and prioritises crimes against women and children in trial proceedings.
- **Protection of Women from Domestic Violence Act, 2005 (PWDVA)** – In India, domestic violence is governed by this Act.
- It defines an “aggrieved person” as any woman who is, or has been, in a domestic relationship with the respondent.
- Domestic relationship means they live or have lived together in a shared household, and can be related by marriage, adoption, or family ties.
 - **Section 3** – It defines domestic violence as any act that harms a woman’s physical or mental health or endangers her safety, including harassment for unlawful demands.
- The term “domestic violence” includes:
 - **Physical abuse** (harm, injury, or threat)
 - **Sexual abuse** (any non-consensual or humiliating sexual act)
 - **Verbal / emotional abuse** (insults, threats, humiliation)
 - **Economic abuse** (withholding money, denying access to resources, disposing of property)
 - **Dowry-related harassment** or coercion for property / dowry
- **Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013** – This Act applies to all women, regardless of age, job type, or work sector.
- It mandates employers to create an Internal Committee (IC) in workplaces with over 10 employees, while the Appropriate Government sets up Local Committees (LCs) for smaller organisations or cases against employers.
- The Ministry of Women and Child Development (MWCD) oversees implementation and awareness.
- To centralise complaint data, the MWCD launched SHE-Box, a portal for reporting and tracking cases, with inquiries under the Act required to be completed within 90 days.
- **Mission Shakti** – It is an integrated, mission-mode umbrella scheme designed to enhance women’s safety, security, and empowerment.
- It operationalises the government’s vision of “women-led development” by tackling challenges women face throughout their life cycle, promoting coordination across ministries, and encouraging citizen ownership to position women as equal contributors to nation-building.
- **Shelter homes under ‘Swadhar Greh Scheme’** – The Ministry of Women and Child Development is implementing the Swadhar Greh Scheme.
 - The scheme caters to primary needs of women in difficult circumstances.
 - It includes women and girls rendered homeless due to family discord, crime, violence, mental stress, social ostracism as well as women and girls at risk of being forced into prostitution.
 - Through the provisions of shelter, food, clothing, counselling, training, clinical and legal aid, the scheme aims to rehabilitate such women in difficult circumstances, both economically and emotionally.
- **One Stop Centre** – The Ministry of Women and Child Development also implemented the One Stop Centre (OSC) Scheme.

What is Digital Abuse?

Digital tools are increasingly being used to stalk, harass, and abuse women and girls.

This includes:

- Image-based abuse/ non-consensual sharing of intimate images.
- Cyberbullying, trolling, and online threats.
- Online harassment and sexual harassment.
- **AI-generated deepfakes.**
- Hate speech and disinformation on social media platforms.
- **Doxxing** – publishing private information.
- Online stalking or surveillance/tracking to monitor someone’s activities.
- Online grooming.
- **Catfishing** and impersonation.
- **Misogynistic networks** – e.g. manosphere, incel forums.



What is Manosphere

Online misogyny is increasingly infiltrating schoolyards, workplaces, and intimate relationships, reflecting deeper societal issues that need urgent attention and action.



- These OSCs provide a range of integrated services under one roof including police facilitation, medical aid, legal aid and counselling, psycho-social counselling and temporary shelter to women affected by violence or those in distress.
- **Stree Manoraksha** – It is for providing basic and advanced training under project ‘Stree Manoraksha’ to the staff of One Stop Centres across the country.
- They are trained on handling psycho-social and mental health care needs to support the women facing violence and distress.
- **Digital Shakti Campaign** – The National Commission for Women has been implementing the Digital Shakti Campaign, a pan India project aimed at digitally empowering and skilling women and girls.
- In line with its commitment to create safe online spaces, Digital Shakti equips women with the skills and awareness needed to protect themselves and take action against illegal or inappropriate activities online.
- **National Domestic Violence Helpline** – It works with the aim to provide 24x7 emergency and non-emergency support to women facing any form of violence or distress.
- The scheme offers assistance nationwide through a toll-free number 181, connecting women to services via a referral system.
- **Nirbhaya Fund** – The Government also implements Emergency Response Support System (ERSS) under the Nirbhaya Fund.
- It is a pan-India, single, internationally recognised number, i.e., 112 based system for various emergencies such as police, fire and ambulance services, with computer aided dispatch of field resources to the location of distress.
- In addition to that, a WhatsApp number 7217735372 was also launched as emergency response during Covid Pandemic lockdown.
- In matters which required urgent intervention, the State Police authorities were also approached through telephone calls/ email for providing immediate assistance to these women.

What are the Institutional Mechanisms?

- **Fast Track Special Courts (FTSCs)** – Operationalised under the Nirbhaya Fund, these courts expedite trials for rape and POCSO cases.
- **Women Help Desks (WHDs)** – Set up in police stations to facilitate sensitive reporting of gender-based violence.
- **SHe-Box Portal** – The Ministry of Women and Child Development launched the SHe-Box portal, a unified online platform fully aligned with the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act).
 - **Serves as a centrally accessible repository** – It contains details of all Internal Committees (ICs) and Local Committees (LCs) constituted across government and private sector organisations nationwide.
 - The portal enables women to lodge complaints of workplace sexual harassment, track their progress in real time.
 - It ensures that every complaint is automatically routed to the concerned IC/LC of the respective workplace, whether in Central Ministries, State/UT administrations, or private entities.
 - **Nodal officers** – It mandates the appointment of a nodal officer in every organisation to regularly update committee details and complaint status, facilitating effective monitoring and swift redressal.

What are some technology-driven initiatives to monitor the progress of schemes?

- **Investigation Tracking System for Sexual Offences (ITSSO)** – An online platform that enables real-time monitoring and tracking of police investigations in sexual assault cases to ensure timely completion.
- **National Database on Sexual Offenders (NDSO)** – A central registry of convicted sexual offenders designed to help law-enforcement agencies identify and track repeat offenders.
- **Crime Multi-Agency Centre (Cri-MAC)** – This system facilitates instant sharing of information on heinous and inter-state crimes among police stations and higher authorities across all States and Union Territories via alerts, emails, and SMS which strengthens coordination, leading to a rapid response.

What lies ahead?

- These integrated efforts reflect the nation’s commitment to building a safer, more inclusive environment where every woman and girl both offline and online can live with dignity, freedom, and equal opportunity.

G. S. PAPER II

5. INDIAN POLITY

5.1 Need for Greater Scrutiny of the Constitution

Recently, the central government introduced the Constitution (One Hundred and Thirtieth Amendment) Bill in Parliament.

What is the bill about?

- **Removal of ministers** – The Bill provides that in case a Minister is arrested and detained in custody for 30 consecutive days, for an alleged offence punishable with imprisonment which may extend up to 5 years or more:
 - He shall be removed from office by the President, on the advice of the Prime Minister, which is to be tendered by the 31st day of such custody.
 - Or, he shall cease to be a Minister in case such advice is not tendered by then.
- A similar provision is provided for Ministers in State Assemblies, who shall be removed by the Governor on the advice of the Chief Minister.
- **Removal of PM/CM** – In the case of the Prime Minister and Chief Minister of a State, they are required either to tender their resignation by the 31st day or else shall (automatically) cease to be the Prime Minister or Chief Minister of a State.
- **Articles to be amended** – The following articles are to be amended to give effect to the bill
 - **Article 75** – Union Council of Ministers
 - **Article 164** – State Council of Ministers
 - **Article 239AA** – The special administrative provisions for Delhi.

What are the issues and concerns raised by the opposition parties?

- **The argumentative issues** – The 2 contentious issues that forced the Opposition to come together against the Bill were:
 - Arrest by the police
 - Authorizing 'detention' by a court.
- Since, wide discretion lies with both, there needs to be scrutiny of the Bill to ensure that it is not misused.
- **Arrest** – The first parameter to remove a Minister is arrest, which is discretionary and in the hands of the enforcement agencies.
- **Provision of Bharatiya Nagarik Suraksha Sanhita (BNSS)** – It provides for the enforcement of some conditions before there is an arrest for offences that are punishable for up to 7 years of imprisonment.
 - For instance, A police officer *doesn't have to automatically arrest* someone accused of a cognizable offence, even if it is punishable with more than 7 years in jail.
- **Deenan vs Jayalalitha (1989)** – The Madras High Court, refused to interfere in the police investigation when the petitioner pleaded before the High Court to use its inherent powers to direct the Commissioner of Police to arrest the respondent, Jayalalitha.
- The High Court said that *the words 'may arrest' under Section 41* showed that the power of arrest is discretionary and that a police officer is not always bound to make an arrest for cognisable offences.
- Though he has the power to arrest, he can refrain from arresting persons, depending upon the nature of the offence and the circumstances unfurled not only in the complaint but also during the course of investigation.
- The authorised power of arrest of an offender by a private person is restricted to cases of commission of non-bailable and cognisable offences in his presence and to the case of the proclaimed offender, not otherwise.
- **Joginder Kumar vs State of U.P. (1994)** – The Supreme Court observed that no arrest can be made only because a police officer is authorised to do so.
- The police officer must be able to justify the arrest.

- Arrest and detention in a police lock-up of a person can cause incalculable harm to the reputation and self-esteem of a person, the Court said.
- **Amarawati and Anr. (Smt.) vs State Of U.P. (2004)** – The Allahabad High Court, held that the Legislature has consciously used the words ‘may arrest’ and it was not mandatory for the police to make an arrest in a cognisable offence.
- It carefully examined the definition of ‘cognisable offence’, provisions of Section 41 and Section 157 of the Code of Criminal Procedure (CrPC).
 - **Section 157 of the CrPC** – It empowers the police to investigate a cognisable offence and arrest the accused, if required.
- In 2009, in an amendment of Section 41 of the CrPC, some distinction was made for arrest in offences punishable with imprisonment extendable up to 7 years and offences punishable with over seven years of imprisonment.
 - **Section 41A of the CrPC** – It provides for issuing notice of appearance (when arrest of a person is not required).
 - But it does not make a differentiation between offences based on their term of imprisonment.
- **Satender Kumar Antil vs CBI and Anr. (2022)** – The Supreme Court, held that the investigating agencies are bound to comply with the provisions of Section 41 and Section 41A CrPC. Section 35 of the BNSS is pari materia to Sections 41 and 41A of the CrPC, read together.

What could be the situations of misuse?

- **Misuse of arrest** – The misuse of this discretionary power of arrest by the police to target leaders of the Opposition parties is a serious issues.
 - **Objection from courts** – High Courts have repeatedly taken objection for not following the directions issued in *Armesh Kumar vs State of Bihar and Another (2014)*.
 - The direction mandated that the investigating officer record reasons and material which necessitated the arrest.
 - **Police commission report** – The National Police Commission (1977) in its 3rd report observed that nearly 60% of the arrests were unnecessary or unjustified.
 - **Arrest as a political tool** – The police could be alleged to be amenable to political pressure.
 - The ‘arrest’ may be used as a political tool to initiate the unseating of Ministers in Opposition parties.
- **Misuse of detention** – The 2nd parameter is continuous detention in custody for “30 consecutive days”, which signifies the importance of bail.
 - **Exemption** – If a Minister is able to obtain bail within this period, disqualification under Article 75(5A) would not operate.
- Though the Supreme Court has repeatedly reaffirmed the principle that ‘bail is the rule, jail is the exception’, bail is often rejected for factors other than the triple test – i.e., flight risk, possibility of tampering with evidence, and threatening of witnesses.
 - **For instance**, the gravity or seriousness of an offence is considered to be an important fourth factor, despite its conflict with the presumption of innocence of the accused.
- So, while bail may be granted in early stages in economic offences, it is extremely difficult in heinous offences unless the accused has undergone considerable incarceration.

What are the main issues?

- **Default bail** – The new Amendment does not account for default bail under Section 167(2) CrPC (Section 187, BNSS).
- Since the cumulative period of police and judicial remand itself exceeds 30 days, the restriction under Article 75(5A) does not seem to be rational.
- It is true that remand is not mandatory jail time and needs to be extended by the court at intervals, but courts readily grant this extension within the outer limits of 60 days to 90 days.
- **Twin conditions of bail** – The phrase ‘an offence under any law for the time being in force’ includes complaints filed under special statutes such as PMLA (money laundering), NDPS (narcotics), and UAPA (unlawful activity).

Default bail is the right of an accused person when the investigation is not completed within 60 days to 90 days (depending on the gravity of the offence) of his custody.

- This is even more dangerous since all special statutes have the infamous twin conditions of bail that are not present in the CrPC/BNSS.
 - **1st condition** – The accused must prove that he is not guilty of the offence.
 - **2nd condition** – He would not commit an offence while on bail.
- As opposed to trial, these conditions must be satisfied at the stage of bail itself.
- They are often termed onerous and reverse the burden of proof from the prosecution to the accused.
 - **For instance**, The Manish Sisodia case, where he was accused in the liquor policy scam, is a case in point – bail was granted 17 months after his incarceration under the PMLA.
- This being the norm for special statutes, the threshold of “thirty consecutive days” under the new Amendment Bill would be an abysmally low benchmark to cross.
- Removal from office would be extremely damaging.
- **Influencing the witnesses** – The factor which may hinder bail to a Minister is their ability to influence witnesses due to their position of power, which is considered significant to an investigation and trial.
- **Hobson’s choice** – A Minister either continue or get bail.
 - Staying on as a Minister would jeopardise bail and therefore mean removal under the amended provisions,
 - While resigning would prevent him from carrying out ministerial duties even if bail was granted.
- **Position of Judge** – A factor that makes bail uncertain and vulnerable is whether the judge concerned has a pro or ante liberty stance under Article 21.
- Leaving aside the objective facts of a case, this brings about enormous subjectivity and discretion in granting bail.

5.2 Contempt of Court

Recent controversy over the alleged contemptuous and derogatory remarks against the Chief Justice of India & the Supreme Court has considered an act of diminishing the ‘authority’ of India’s top court.

What is Contempt of Court?

- **Contempt of court in India** – Refers to any act that disrespects, obstructs, or undermines the authority and dignity of the judiciary.
- **Objective** – To maintain the authority and dignity of the judiciary, ensuring that the legal process is respected and upheld.
- **Origin** – The contempt of court law in India has deep colonial roots, originating from **British legal traditions** that prioritized judicial authority over public criticism.
- **Contempt is not similar to Mere Disrespect** – It goes beyond casual criticism—targeting actions that disrupt or undermine the justice system.

What is the legal framework?

- **Mentioned in Article 19** – The phrase ‘contempt of court’ is used in **Article 19(2)** as one of the grounds for imposing reasonable restriction on fundamental freedoms.
- **No procedural guidelines in Constitution** – The Constitution does not explain how to initiate the contempt proceedings.
- **Court of record** – In India, the Supreme Court and High Court have been designated as courts of record under **Article 129 and 215** respectively.
- A court of record is one whose decisions are kept in reserve for future references and inherently it also has the power to punish for its contempt.
- **Statutory Explanation** – This implicit constitutional provision is explained in the **Contempt of Court Act, 1971**.

What are the types of Contempt in India under the Contempt of Court Act, 1971?

- **Two types of Contempt** – Civil and Criminal Contempt.

- **Section 2(b) of 1971 Act** - Defines **civil contempt** as willful disobedience to any judgment, decree, direction, order, writ or other process of a court or willful breach of an undertaking given to a court.
- **Section 2(c) of 1971 Act** – Defines **criminal contempt** as the publication (whether by words spoken or written or by signs or by visible representations or otherwise) of any matter or the doing of any act which:
 - **Scandalizes** or lowers the authority of any court; or
 - **Prejudices** or interferes or tends to interfere with, the due course of any judicial proceeding; or
 - **Interferes** or tends to interfere with the administration of justice in any other manner
- **Punishment** – Under Section 12 of the Act, contempt can be punished with simple imprisonment for up to six months, a fine up to Rs. 2,000, or both.

What are the procedures for initiation of contempt proceedings?

- **Suo motu** – The High Court or Supreme Court may initiate contempt proceedings *suo moto*.
- **Reference** – A subordinate court can refer a case to the High Court for contempt proceedings, or the Advocate General can bring a motion for criminal contempt in a High Court.
- **Private petition** – A private party can bring the matter to the court's attention, but they are considered an "informer" or "relator," not a complainant.
 - **With consent** – To initiate proceedings for criminal contempt, a private party must obtain the written consent of the Attorney General (for the Supreme Court) or the Advocate General (for High Courts).
 - **Without consent** – If the AG denies consent, the petition cannot proceed.

What are the criticisms related to Contempt of Court?

- **Lack of clarity** – The Contempt of Courts Act, 1971 are vague and lack clarity, can be interpreted variably, leading to potential judicial overreach.
- **Inhibits democratic discourse** – The fear of contempt action may discourage open and constructive critique of the judiciary, impacting freedom of expression.
- **Burden on the judiciary** – Frequent contempt proceedings contribute to judicial congestion, diverting time and resources from other pending matters.
- **Colonial legacy** – The colonial legacy prioritizes judicial insulation over democratic accountability, often clashing with Article 19(1)(a) of the Constitution.
- **Potential misuse by judiciary** – The judiciary acts as judge, jury, and prosecutor in contempt cases, raising concerns about conflict of interest and lack of checks and balances.
- **Lack of accountability** – Contempt powers may be used to shield the judiciary from public scrutiny, reducing transparency and accountability.
- **Inconsistency in enforcement** – Selective or delayed action in high-profile cases creates perceptions of bias or unequal treatment.

What are the judicial stand on criticism and Contempt?

- **Ashwini Kumar Ghosh vs. Arabinda Bose (1952)** – Fair criticism is allowed.
 - Fair and reasoned criticism of a decided case does not amount to contempt, whereas, excessive or malicious commentary may be considered contemptuous.
- **Anil Ratan Sarkar vs. Hiralal Ghosh (2002)** – Caution in exercising contempt powers.
 - The Court held that the power to punish for contempt must be exercised with caution and shall only be exercised when there is a clear violation of an order.
- **M. V. Jayarajan vs. High Court of Kerala (2015)** – Abusive public speech as criminal contempt
 - The Supreme Court upheld contempt charges for abusive language used in a public speech while criticising a High Court order, such actions could be deemed to undermine judicial authority and disrupt justice delivery.
- **Shanmugam @ Lakshminarayanan vs. High Court of Madras (2025)** – Purpose of contempt powers reaffirmed
 - The Supreme Court clarified that the core aim of contempt proceedings is to protect the administration of justice, not to shield judges from criticism.

What lies ahead?

- Democratic criticism of the judiciary is acceptable, but one must respect its vital role in shaping state priorities and upholding the sanctity of justice.
- Misrepresentation by the state or citizens can lead to contempt of court and undermine democratic values, ultimately hindering the delivery of substantive justice.

5.3 Attorney General of India - Role and Importance

Recently, the Attorney General of India (AGI) Calls for 'National Mediation Movement', Says India Should Lead the World in Collaborative Justice.

What is the process of appointment of AGI?

- **Appointment** – *Article 76* of the Constitution mandates the President to appoint the AGI, who is qualified to be a judge of the Supreme Court of India.
- **Other qualifications** – Accordingly, the AGI must be an Indian citizen and must have:
 - Served as a judge of a High Court for at least five years, or
 - An advocate of a High Court for at least 10 years, or
 - An eminent jurist as in the opinion of the President.
- This requirement of the highest judicial qualifications underscores the importance of the office.
- **Retirement** – It is important to note that while Supreme Court judges retire at the age of 65, there is no prescribed age of retirement for the AGI.
- **Tenure** – The AGI, who is appointed by the President on the advice of the Union Cabinet, holds office during the pleasure of the President (no fixed tenure), who also determines his/her remuneration.

How the Constitution places AGI in a unique position?

- **Establishment of the office** – The post of the AGI was established by the Constitution of India and came into force with its adoption in 1950.
- This ensured that the newly formed government has access to expert legal counsel.
- In doing so, the Constitution places the AGI in a unique position that enables interaction with all three organs of the state – Executive, Legislature, and Judiciary.
- **Rights in the parliament** – Under Article 88, the AGI has the right to speak and take part in the proceedings of both Houses of Parliament, their joint sittings, and any parliamentary committee of which he/she may be a member, but without the right to vote.
- **Privileges** – The Constitution also grants the AGI all the privileges and immunities available to a Member of Parliament (MP), under Article 105.
- The AGI is assisted by the Solicitor General and Additional Solicitors General in all functions, although only the office of AGI is constitutionally created.
- **Powers w.r.t to contempt proceedings** – The AGI and the Solicitor General have also been granted the power to grant or deny consent for contempt of court proceedings against individuals who make controversial remarks against sitting judges.
- While the courts may initiate Contempt of Court proceedings *suo motu* without the AGI's consent, a private person can only initiate contempt proceedings with the written consent of the AGI.
- Thus, the AGI functions as a gatekeeper against frivolous contempt actions, balancing judicial dignity with the right to free speech and fair criticism.
- Alternatively, the AGI office can directly move the court to initiate proceedings in certain public interest cases.
- **Right of audience** – Under Article 76(3), the AGI enjoys the right of audience in all courts, including the Supreme Court and High Courts, in the performance of his duties.
- This means that no court can refuse to hear the Attorney General when he/she seeks to make an official submission, effectively ensuring that the government's legal position can always be represented or clarified in all courts.
- Notably, this provision is borrowed from the British convention, where the Attorney General for England and Wales has a right of audience in all courts.

What are the important roles and functions of AGI?

- **Advisory role** – In the advisory capacity, the AGI provides legal advice to the government on matters referred or assigned to him by the President.
- **Representative role** – The AGI also represents the government in all cases in the Supreme Court, and in High Courts when required.
- The AGI also presents the government's views to the Supreme Court in any reference made by the President under Article 143 (President's power to consult the Supreme Court).
- As the top legal representative of the government, the AGI serves as the government's voice before the Supreme Court.
- **Protecting the constitutional integrity** – The office ensures that executive actions conform to the Constitution and the law, thereby protecting the constitutional integrity of the ruling dispensation.
- **Acts as a connecting line** – Participating in Parliamentary debates, the AGI acts as a bridge between the executive and the legislature and provides expert legal insights.

AGI is often referred to as the 'Chief Legal Advisor' and the 'First Law Officer'.

How the Constitution ensures AGI's impartiality?

- **Restriction on advice** – The AGI is not permitted to:
 - Advise or hold a brief against the Government of India.
 - Advise or represent any party in a case in which he or she is called upon to advise or appear for the Government of India.
- The AGI cannot defend accused persons in criminal prosecutions without the permission of the Government of India.
- **Barred appointments** – The AGI is also barred from accepting appointment as a director in any company without prior permission from the Government of India.
- **Can take up private practice** – However, it is important to remember that the AGI is not a full-time government servant and therefore can engage in private legal practice, subject to these restrictions.
- **Not a member of cabinet** – The AGI is not a member of the Union Cabinet, and the political and executive aspects of legal affairs are handled by the Minister of Law and Justice, not by the AGI.
- This institutional arrangement is meant to safeguard the AGI's impartiality.

What are the challenges for the AGI?

- **Striking the balance** – One of the most significant challenges for the AGI is to strike the right balance between loyalty to the executive and the duty to uphold the Constitution and the rule of law.
- **Convention** – Although the AGI is appointed by the President, there is an ongoing convention that the AGI resigns when the Council of Ministers resigns or a new government assumes office.
- **Lack of a fixed tenure** – It is often cited as a potential threat to the independence of the AGI, as it may, at times, leave him/her vulnerable to executive influence.
- However, the recent practice of stating a fixed term at the time of appointment – for example R Venkataramani's initial three-year term (2022-2025), extended by two years – has been viewed as a progressive step.
 - Despite these limitations and challenges, the AGI plays a key role in the functioning of the Indian Republic.
- AGI stands at the intersection of executive policy and judicial review, not just as the Union Government's lawyer, but also as the keeper of the Constitutional conscience of the government and the chief defender of the rule of law in the apex court.

5.4 Special Intensive Revision (SIR) 2.0

The Election Commission of India (ECI) has initiated the Special Intensive Revision (SIR) 2.0 across 12 States and Union Territories (UT). While the exercise is significant, caution is essential as it may inadvertently exclude eligible voters.

What is Special Intensive Revision (SIR) 2.0?

- **SIR** – It is a comprehensive, **house-to-house verification process** of electoral rolls conducted by ECI.
- **SIR 2.0** – It will take place in **12 states & UT**–

- Includes Andaman and Nicobar, Chhattisgarh, Goa, Gujarat, Kerala, Lakshadweep, Madhya Pradesh, Puducherry, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.
- **Aim** – To ensure that all eligible citizens are included in the electoral roll.
- **Verified by** – Booth Level Officers.
- **SIR 1.0** – Was concluded in Bihar.
- **No SIR for Assam** – Because of its unique situation with the National Register of Citizens (NRC) and ongoing citizenship-related scrutiny, it will be notified later.

What are the key features and provisions of SIR 2.0?

- **Process of SIR 2.0** –

- House to house enumeration phase - where Booth Level Officers (BLOs) visit each household and give out forms.
- Publication of draft electoral roll
- Claims and objection period
- Notice phase (hearing and verification)
- Publication of final electoral roll.

- **Appeal Process for Deletion** – If a voter's name is deleted, they can

- **First appeal** to the District Magistrate (DM).
- **Second appeal** to the Chief Electoral Officer (CEO) if not satisfied with DM's decision.

- **Required documents for SIR** – 12 documents -

- Any identity cards, Pension payment order issued to regular employee/pensioner of any central government/State govt/PSU.
- Any identity cards/ certificate/documents issued by Indian govt./ Banks/local authorities/PCU
- Birth certificate issued by competent authority
- Passport
- Matriculation/Educational certificate issued by recognised Boards/Universities
- Permanent resident certificate issued by State authority
- Forest Rights Certificate
- OBC/ST/SC or any caste certificate
- National Register of Citizens (wherever it exists)
- Family register prepared by State/Local authorities
- Any land/house allotment certificate by Govt.
- Aadhaar (included as per the Supreme Court's order)

No document is required during the enumeration process.

To Know about Various Electoral Forms & SIR, click [here](#)

What are the issues that associated with SIR 2.0?

- **Fear of disenfranchisement** – It is the documentation-heavy voter re-verification process, has raised fears of large-scale disenfranchisement and fears of stealthily instituting a citizenship screening mechanism.
- **Flaws in revised rolls** – Including a sharp decline in the adult-electors ratio, disproportionate deletions of women and Muslim voters, and duplicate names and bogus entries.
- **Concerns Over Procedural Fairness** – The current SIR lacks robust checks and balances, making it vulnerable to external interference.

Legal basis
<ul style="list-style-type: none">● Article 324 - Of the Constitution is a fundamental provision that establishes the Election Commission of India (ECI) and vests it with the plenary powers required to ensure free and fair elections.● Section 21 - Of The Representation of the People Act (RPA), 1950 deals with the critical process of Preparation and Revision of Electoral Rolls. This Section essentially lays down the legal framework and procedure for maintaining the voters' list for every constituency.● The Registration of Electors Rules, 1960 - Are statutory rules framed by the Central Government under Section 28 of the RPA 1950. They provide the detailed procedure and forms for the preparation, revision, and correction of the Electoral Rolls for Parliamentary and Assembly constituencies in India.

- **Institutional Concerns** – The ECI’s role in Bihar’s voter revision has raised doubts about its fairness and credibility.
 - Instead of ensuring accurate and inclusive voter lists, it seems more focused on protecting its authority and avoiding scrutiny.
- **Judicial Oversight** – Although the SC monitored the process, it did **not address the key legal issue** – whether the EC has the legal power and rules to carry out such an exercise.
 - This could allow a flawed system that unfairly affects minorities and vulnerable groups to become permanent.
- **Issue of internal migrants** – Internal migrants, **especially in Tamil Nadu**, face challenges in securing voting rights due to rigid residency norms.
 - **Section 19 of the RPA, 1950** - requires that a person is ‘ordinarily resident’ in a constituency for inclusion in its electoral roll & **Section 20** provides the meaning of the term ‘ordinarily resident’.

What need to be done to address the shortcomings of SIR 2.0?

- **Need for Social Audit** – The current SIR lacks rules, oversight, scrutiny, and audit mechanisms highlighted the urgent need for mandatory social audits in consultation with civil society and political parties.

*A social audit is a public review where people examine official records and share testimonies to confirm or question the information - When done at the **panchayat, ward, or booth level**, it becomes the most effective way to revise electoral rolls.*

- The Constitution under **Article 243A & 243J** empowers such monitoring and audit.
- **Precedent for Social Audits** – In 2003, under Chief ECI J.M. Lyngdoh - the decentralized social audits were conducted in gram sabhas/ward sabhas.
- **Reform for ease of migrants** – Broaden the definition of “ordinary residence” to reflect modern mobility and introduce portable voter registration mechanisms and simplified documentation for migrants.
- **Define clear legal guidelines** – Enact clear rules under the RPA, 1950 to define the scope, powers, and procedures of SIR and ensure parliamentary oversight and public consultation in rule formulation.
- **Independent Scrutiny & Appeals** – Establish third-party audits and public disclosure of deletion/inclusion decisions and strengthen the appeal process with time-bound redressal and multilingual support.

5.5 Presidential Reference to Supreme Court

Recently, a five-judge Bench of the Supreme Court on November 20, 2025 answered the 16th Presidential Reference under Article 143.

What is presidential reference to the Supreme Court?

- **Article 143** – It empowers the President of India to seek the SC’s advisory opinion on any question of law or fact that is of public importance and is likely to arise or has already arisen.
- This provision establishes the SC’s advisory jurisdiction, which is exclusive to the President.
- **Article 143 (1)** – The President may refer any question of law or fact of public importance which has arisen or which is likely to arise.
 - Here, the Supreme Court may tender or may refuse to tender its opinion to the president.
 - **For example**, the Supreme Court has declined to provide its opinion in 1993 with respect to the Ram Janmabhoomi case.
- **Article 143(2)** – It allows the President to refer disputes arising from out of any pre-constitution treaty, agreement, covenant, or other similar instruments.
- The SC must tender its opinion to the President.
- **Nature of the Advise** – In both the cases, the opinion expressed by the SC is only advisory and not a judicial pronouncement.
- It is not binding on the president and He/she may follow or may not follow the opinion.
- **Article 145 (3)** – It requires such references to be heard by a bench of at least five judges.

- **Historical Context** – Advisory jurisdiction under Article 143 is derived from the Government of India Act, 1935, which allowed the Governor-General to refer legal questions to the federal court.
- **International practices** – The Canadian Constitution allows its SC to provide legal opinions.
- The US SC refrains from giving advisory opinions to uphold a strict separation of powers.
- **Past Instances of Such References** – There have been about 15 Presidential references to the Supreme Court under Article 143.

What is the recent presidential reference related to?

- **Presidential reference** – The Reference was made under Article 143 of the Constitution after President Droupadi Murmu submitted 14 questions following the Court's April 2025 judgment.
- **April 2025 judgement** – The ruling, delivered in a case brought by the Tamil Nadu government, held that Governor R.N. Ravi's delay in assenting to ten re-passed State Bills was illegal.
- In this judgment, the apex court, for the first time, imposed judicially enforceable timelines on both Governors and the President.
- The Reference seek clarity on whether courts can direct constitutional authorities on how and when to act.

What was the observations and advices of the Supreme Court?

- **Not bound by timeline** – The five-judge Constitution bench of the Supreme Court on clarified that governors and President *are not bound by judicially prescribed timelines in the discharge of functions*.
- Imposing timelines on the President and Governors to deal with all Bills pending with them for assent through judicial orders would be akin to taking a “one-size-fits-all” approach.
- Especially in the absence of any constitutionally prescribed schedule or manner of exercise of powers by Governors or the President under Articles 200 and 201.
- **Nature of bills** – The court rationalised that some Bills may deal with complex issues and require longer consideration.
- At the expiry of this one-size-fits-all timeline, it creates a right for judicial redressal, prima facie rendering the act of the Governor or President suspect upon the expiry of such timeline.
- **President's discretion** – The Reference Bench said the President need not consult the Supreme Court on every State Bill referred to her by Governors for consideration.
- It would be left to the discretion of the President to take the advice of the Supreme Court under Article 143.
- **Limitations of the courts** – The Bench clarified that the courts had no power to review the merits of Bills.
- It is impermissible for the courts to undertake judicial adjudication over the contents of a Bill, in any manner, before it becomes law.
- The people's will expressed through the legislative branch is only definitive and conclusive upon receiving the assent of the Governor or the President, as the case may be.
- **Against spirit of the constitution** – The usurpation of the gubernatorial function of the Governor, and similarly of the President's functions, is antithetical not only to the spirit of the Constitution, but also specifically, the doctrine of separation of powers – which is a part of the basic structure of the Constitution.
- **Inaction by President/ Governors** – The court clarified that the President and Governors cannot resort to prolonged and evasive inaction, by sitting endlessly on State Bills awaiting their approval.
- This would amount to a deliberate attempt to thwart the people's will expressed through the proposed welfare laws passed by State legislatures.
- **Scope of Article 200** – It clarified that a Governor has actually three options before him under Article 200:
 - To grant assent to the Bill,
 - Reserve it for the consideration of the President, or
 - Withhold assent and return the Bill to the State legislature with comments if it is not a Money Bill.
- A Governor cannot stall a Bill without returning it to the State Assembly along with his reasons for doing so.
- **Undermining federalism** – It would be against the principle of federalism and a derogation of the powers of the State legislatures to permit the Governor to withhold a Bill without following the dialogic process.
- Dialogic process is a part of the system of checks and balances and federal system that our Constitution envisages.

- **Governor's discretion** – The court opined that a Governor was not bound by the aid and advice of the Council of Ministers while exercising his function under Article 200.
- He had discretion to choose any of the 3 options –
 - To give assent for a bill or,
 - Reserve a Bill for the consideration of the President or
 - Withhold assent or return the proposed law to the State legislature with comments.
- **Chances for issuing mandamus** – In glaring circumstances of inaction that is prolonged, unexplained, and indefinite, the Court can issue a limited mandamus for the Governor to discharge his function within a reasonable time period.
- Immunity to Governor – The restricted review of the Governor's inaction would not entail subjecting him personally to judicial proceedings.
- The Governor enjoyed absolute personal immunity from court proceedings under Article 361 of the Constitution.

What are reasons mentioned by the court for answering the presidential reference?

- **Constitutional duty** – Endowed with the institutional capacity and the constitutional duty to answer references that will ensure that the Constitution is nurtured and worked for the benefit of the people.
- **Constitutional dialogue** – The exercise of this advisory function is a constitutional dialogue between the Executive and the Judiciary.
- **Ensuring smooth function** – An authoritative opinion mandated since the law on the functions of Governor and President under Article 200 and Article 201, cannot be left in a state of confusion, as it would impede smooth functioning of the Constitution.
- **President's satisfaction** – There exists substantial satisfaction of President, that these are questions of law that have arisen, or are likely to arise, which are of public importance, which necessitate that an opinion be sought from this court.
- **Institutional responsibility** – It is an institutional responsibility, to tender its opinion on this functional reference sought by the highest constitutional functionary of the country.
- **Responsibility of the court** – The court cannot shirk away from its responsibility to iron out constitutional creases, to authoritatively clarify the roles of constitutional institutions, when doubts as to their roles and powers are raised.
- **Duty of the court** – This court is empowered, and entrusted under Article 143, with the duty to answer such questions in service of the Constitution, and the people that have so adopted it.
- **Integrity** – Judicial propriety, and institutional integrity requires that this Court answer the questions referred to it in the present proceedings.
- **A big jump in logic** – There is no reasonable connection between not disclosing the judgment and assuming bad intention.
- Such an accusation is not appropriate for the Court to even consider, especially because it is made against the President, who is the highest constitutional authority
- **Irrelevance of the questions** – Earlier, someone could challenge (object to) a *reference* made to the Supreme Court by saying it was done with bad intention (malafide).
- But now, after the Supreme Court's decision in the Natural Resources Allocation case, such a challenge is no longer allowed.
- Therefore, questioning the honesty or intention behind making the reference is not relevant or permitted anymore.

5.6 Issues with Lower Judiciary

A Constitution Bench of the Supreme Court of India has recently linked the sense of stagnation in the subordinate judicial service to prolonged litigation and the huge pendency in India's courts.

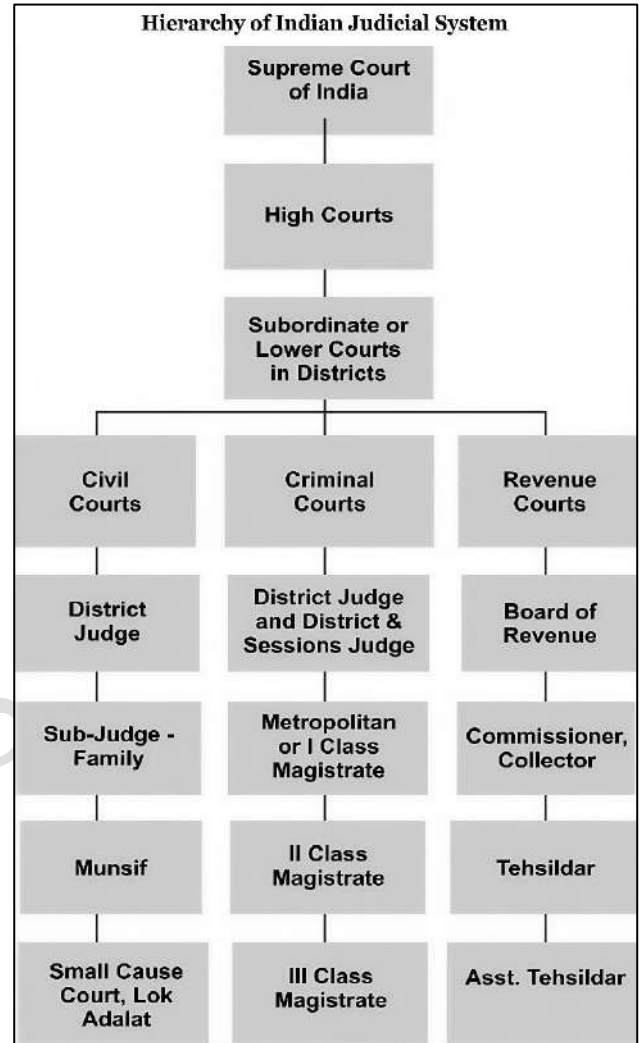
What is the structure and role of the judicial system in India?

- **Part VI** of the Constitution of India, deals with the articles related to Subordinate Courts in India.

- The subordinate courts form the backbone of India's judicial system, serving as the primary point of access to justice for millions of citizens.
- **Articles 233 to 237** of the Indian Constitution establish the fundamental framework for Subordinate courts, ensuring their proper functioning, independence, and administration.
- **Administrative Control** – High Courts oversee inspections, postings, promotions, discipline and ensure uniform judicial standards across districts.
 - State Governments manage court buildings, financial outlays, personnel support, and help conduct judicial service exams through PSCs.
- **Recruitments – Lower Judicial Service** recruits fresh law graduates (0–7 years' experience) appointed as Civil Judges or Judicial Magistrates.
- **Higher Judicial Service** recruits experienced advocates (7+ years at the bar) appointed as District Judges, bringing professional expertise to higher trial courts.

What are the issues that hinders the efficiency of lower courts?

- **Pendency Crisis** – Massive backlog of cases demands urgent intervention from the higher judiciary, not just procedural tweaks at lower levels.
- **Archaic Laws** – Outdated legal provisions hinder swift justice; legislative reform is essential to streamline procedures.
- **Judicial Recruitment** – Without appointing competent and experienced lawyers as judges, qualitative disposal and pendency reduction remain elusive.
- **Procedural Burden** – The **Code of Civil Procedure & Civil Rules of Practice** prescribe detailed procedures for initiating proceedings, issuing summons, and ensuring party appearances.
- **Time consuming routine task** – Subordinate judges are burdened with routine tasks like calling suits, issuing fresh summons, and receiving vakalathnamas, etc consume significant time of the working day.



- According to the **National Judicial Data Grid** data as of September, 2025,
 - **Total pending cases** – Over 53 million pending cases across all levels of courts in India.
 - **Supreme Court** – As of September 2025, the Supreme Court's case pendency stood at 88,625, having crossed the 88,000 mark in August.
 - **District and High Courts** – Over 4.69 crore cases are pending in district courts (highest number of pending).
 - **Cases over 30 years old** – Over 180,000 cases have been pending for more than 30 years in district and high courts.

- **Lack of experienced Subordinate Judges** – Many newly appointed judges lack prior courtroom experience, making it difficult for them to manage workload or pass effective judicial orders.
- **Skill Deficit** – Some judges are unable to issue orders due to inadequate procedural and legal preparedness.
- **Unintended Consequences of Procedural Statutes** – New statutory provisions are often introduced with the aim of speeding up case disposal, but in reality, they often complicate procedures, leading to delays and increased pendency.

- **Procedural Misuse in Civil Litigation** – Several provisions in the ***Code of Civil Procedure (CPC)***, originally designed to ensure fair trial and due process, are frequently misused by litigants.
 - Despite amendments in 1976 and 2002, the CPC remains outdated in ensuring expeditious disposal, focus remains on trial and appeal conduct, not on quick termination of proceedings.
- **Some of the Procedural Bottlenecks** –
 - Preliminary and final rulings in partition suits delay resolution.
 - Mandatory pre-suit mediation under Section 12(a) of the Commercial Courts Act adds unnecessary delays.
 - Cooling-off period in mutual divorce cases prolongs litigation even when parties are in agreement.
 - Jurisdictional ambiguity due to lack of clarity on oral leases and possession under the Transfer of Property Act.

What need to be done to improve the working of lower judiciary?

- **Structural Separation** – Appoint a lowest-rank judicial officer in each district court to handle ministerial tasks for a specific cadre (e.g., senior civil judges, district munsifs) allowing judges to concentrate on merit-based disposal.
- **Need for training** – Mandate observational training for all newly appointed civil and senior civil judges under various High Court Benches.
- **Procedural simplification** – For ensuring balanced timelines, reducing delays, and enhancing the overall efficiency of civil litigation.
 - Allow a single decree in partition suits or make final decree proceedings automatic.
 - Introduce fast-track execution mechanisms with mandatory asset disclosures.
 - Impose reasonable time limits on plaintiffs for filing suits.
- **Modernize CPC** – Shift legislative focus from procedural formality to substantive justice and efficiency, to ensure amendments are outcome-oriented, not merely cosmetic.
- **Role of higher Judiciary** – Reducing pendency is not solely the responsibility of subordinate courts. Higher courts must also ensure timely disposal of appeals and revisions.

5.7 State Public Service Commissions

The 2025 national conference of chairpersons of the State Public Service Commissions (PSCs) is being hosted by the Telangana State Public Service Commission on December 19 and 20.

What is the evolution and significance of State PSCs?

- **State PSC** – On the lines of UPSC in the centre, there is a State Public Service Commission (SPSC) for every state, which is an independent Constitutional body.
- It is basically the major recruiting agency of a state.
- **Constitutional basis** – *Article 315 to 323 (Part XIV)* deals with the composition, appointment and removal of members along with the independence, powers and functions of the SPSC.
- **Evolution and background**
 - **Government of India Act, 1919** – It proposed to set up the Federal Public Service Commission.
 - **Lee commission** – In 1926 on the recommendation of Lee Commission (1924), the Federal Public Service Commission was established.
 - **Government of India Act, 1935** – It provided for the Central and State Public Service Commission.
- **Objectives and Responsibilities**
 - Responsible for the recruitment of the State services and advises the government on promotion and disciplinary matters.
 - Watchdog of merit system in the State.
- **Appointment of members** – The SPSC consists of a Chairman and other members who are *appointed by the Governor of a state*.

- The Governor of a state enjoys discretionary power to determine the composition and conditions of service of the chairman and other members of SPSC.
- **Qualification for appointment** – According to the Constitution of India, 50% of the members of SPSC should be those who have held government office (Government of India/State Government) for at least 10 years.
- It mentions no other qualification.
- **Tenure** – All the members including the Chairman hold office for a six-year term, or until they attain the age of 62 years, whichever is earlier.
- **Resignation from office** – All the members including the Chairman can resign from their offices at any time by addressing their resignation to the Governor.
- The Governor can temporarily appoint one of the members of the SPSC as an acting chairman if
 - The office of the chairman of the commission becomes vacant; or
 - The chairman of the commission is unable to perform the duties of his office due to absence or for any other reason
- **Removal of chairman and members** – Although the Chairman and members of a SPSC are appointed by the Governor, they can be removed only by the President of India if:
 - He has gone insolvent or bankrupt.
 - He engages in any paid involvement during his tenure.
 - He found it unfit to continue in office by reason of infirmity of mind or body.
- The President can also remove the Chairman or any other member of SPSC for misbehaviour,
- However it is subject to judicial inquiry under the supervision of the Supreme Court.
- Under the provisions of the Constitution, the advice tendered by the Supreme Court in this regard is binding on the president

What are the issues faces by State PSCs?

- **Political interference** – State PSCs operate in a politically osmotic environment and the proverbial ‘spoils system’ is visible in the appointment process.
- The conventional requirements of minimum age, qualifications and public experience are given a short shrift.
- **Inadequate manpower** – The manpower needs of the States are limited and not planned unlike UPSC.
- **Insufficient financial resources** – They lack the financial resources to meet the retirement and recruitment obligations of their employees leading to extension of the superannuation age and postponement of recruitment.
- **Lack of dedicated ministry** – Most State governments do not have a dedicated Ministry of Personnel.
- And therefore, vacancies are not notified regularly by the government which effectively means that State PSCs are not required to conduct the examinations regularly.
- **No regular committees** – State PSCs do not appoint committees regularly to redraft the syllabus.
- They are constrained to tap academic resources from within the State and are not able to achieve satisfactory ‘inter-se’ moderation in evaluation.
- **Complexity of reservation** – They also have the daunting task of making complex calculations to accurately incorporate not only vertical reservations but also horizontal reservations.
- Meeting the demands of regional quotas in the form of zonal reservations adds to this complexity. All these lead to continuous litigation in one form or the other delaying the recruitment process.

What can be done?

- **Creation of separate ministry** – Separate ministry should be created for personnel management.
- This Ministry should clearly layout a five-year road map for recruitment so that State PSCs are able to notify and conduct the examination process.
- **Fixing the minimum age of members** – The minimum age for appointment as a member should be fixed at 55 and the maximum age at 65.

- Along the lines of the 41st amendment of the Constitution (1976), which raised the maximum age limit of the members of State PSCs from 60 to 62 years in order to attract meritorious and experienced civil servants, there is a need for another amendment.
- The stipulation of minimum age will enable appointment of experienced individuals while increasing the maximum age will enable State PSCs to benefit from the experience of senior civil servants who have retired at 60 for a longer period than under the existing provisions.
- This amendment could also specify the necessary qualifications that members need in order to be appointed.
 - **For example**, in order to be an 'official' member, experience as Secretary to a State government or a post equivalent to this rank should be stipulated while for 'non-official' members 10 years of practice in a recognised profession like law, medicine, or engineering should be stipulated.
- **Consultation with opposition** – A mandatory pre-consultation with the leader of the Opposition before appointment may be considered for non-official members.
- **Constitution of panel** – A state wide panel of eminent people those with high standing, integrity, merit and independence should be constituted and periodically updated.
- **Periodical revision of syllabus** – The syllabus should be revised periodically, keeping in view the changing academic scenario and the syllabi for examinations as stipulated by the UPSC.
- Every proposal for revision should be placed in the public domain and changes can be made after public consultation.
- **Objective type format** – Knowledge on State specific areas like regional history, regional economy and regional geography, in which the availability of faculty is limited.
- It should be tested in the objective type format so that there would be no scope for complaint on the grounds of asymmetry of information and value laden correction.
- **Combination of objective and subjective papers** – While the preliminary examination may continue in the objective format, the main examination should be a mixture of objective and subjective papers.
- **Eliminating the errors** – The process of translation of the questions from English to the regional language should not only involve technology for secrecy but also the human element so that the right meaning is conveyed.
- Care should be taken to regularly change the pattern of questions so that the role of AI-chat bots, as a source of information for formulating answers, is effectively countered.
- **Appointment of experienced officer** – The Secretary of the State PSCs should be a senior officer with prior experience as either Commissioner of School Education or Secretary of the Board of Intermediate education to enable effective supervision of the examination branch of the Commission.

What lies ahead?

- Transparency and confidentiality should be balanced on the lines of the UPSC.
- If these changes are effected, one would have vibrant Public Service Commissions at the State level on par with the Union Public Service Commission.
- These are some of the main reasons limiting the efficient functioning of State PSCs and their declining credibility.
- Often aggrieved students comment that they have lost faith in State Commissions and would like the UPSC to conduct the examinations.
- Time bound structural and procedural reforms are required to restore faith in State PSCs.

5.8 Presidential Reference V/S The Federal Structure

Recently, the Supreme Court of India's answers to the 16th Presidential reference on the powers of Governors and the President of India has risen many questions.

What are the terms to be understood?

- **Presidential reference** – It is a constitutional mechanism in India, under Article 143, where the President of India seeks an advisory opinion from the Supreme Court on a question of law or fact of public importance.
- **Federal structure** - A federal structure is a system of government where power is divided between a central authority and regional governments (like states or provinces).
- **Status of states in India**

- **Equal partners** – Under the constitutional scheme, the Union and States are equal partners, with the Government of India being only ‘first among equals’.
- **Units of autonomy** – States are not subservient to the Union Government, nor are they secondary appendages, bound by the diktats of the Government of India.
- In fact, in all areas in the State list (such as land laws and law and order), they enjoy complete autonomy.

What are the issues with the governor?

- **Delay in assent to bills** – Delaying the bills passed by the state legislature indefinitely by the Governor would effectively *mow down an ‘elected Legislature’ before the whims of an ‘unelected Governor’*.
- **Acting as agents of ruling party** – Governors are *appointees of the ruling party* at the Centre, who, more often than not, act on the whims of those in power in the Government of India and even actively accommodate their political agendas.
- The scales of federalism and democracy must be weighed between what the Supreme Court calls the *“unwritten and undefined powers”* of an unelected Governor.
- **Serving the political agenda** – Governors act to serve the political agenda of the Government of India vis-à-vis the mandate of an elected State Government and Assembly reflecting the will of the people of that State.
- **Absence of timeline** – Once the Legislature has passed a law, a timeline on the exercise of the powers by the Governor, under Article 200 of the Constitution of India, has to be read therein to bring it in conformity with the principle of federalism, which is part of the basic structure.
- This is not just harmonious but also imperative in the current climate of unprecedented administrative excesses.
- **Past judgement of Supreme Court** – The two-judge Bench in the Tamil Nadu Governor’s case understood this and prescribed finite and reasonable timelines accordingly.
- This decision of the court which led the President to seek an opinion from the Supreme Court.

What are the benchmark to measure the legitimacy of governor's power?

- **Power of the Governor** – It has to be tested on the touchstone of reasonableness, i.e., a reasonable time to think through and decide on the Legislation.
- If this timeline is not read, the Governor will become an unelected despot over an elected Government.
- **Essence of constitution** – Fairness, reasonableness and non-arbitrariness are the threads that run through the veins of our Constitution, and especially Part III which protects citizens against a wayward state.
- If you anoint unelected Governors or even the President of India as unbridled monarchs over elected governments, the entire edifice of the Constitution will start to crumble.
- **Judicial Review** – It is also a part of the basic structure of the Constitution. No authority, howsoever high it may be, including Parliament, can ever say that its actions will not be tested by judicial review.
 - The exercise of powers by the Governor or the President of India cannot remain alien to the principle of judicial review.
 - The office of Governor or the President of India is not bigger than Parliament.
 - Even Parliament cannot escape judicial review for its actions.
- **Against constitution** – The theory of ‘limited direction’ propounded by the Court goes against:
 - The grain of the constitutional scheme,
 - The doctrine of federalism,
 - The doctrine of reasonableness enshrined in Article 14,
 - The doctrine of judicial review and the principles of fairness and justice.
- **Unrestrained powers** – To give such unbridled power to the Governor and the President to keep important pieces of legislation pending for long periods of time, so as to defeat the very purpose thereof, cannot be accepted.

How the federal design is undermined in recent times?

- **GST compensation disputes** – The refusal by the central government to provide compensation to producing States for loss of Goods and Services Tax, thereby effectively disincentivising efficiencies, revenue generation and good governance.

- **Issues with cess** – The cess collected exclusively by the central government being used as an excuse to deny sharing of its revenue with the States.
- **Denial of devolutions** – Refusal by the central government to fully implement the devolutions recommended by the Finance Commission.
- **Placing financial pressure on states** – forcing States to adhere to a ‘one-size-fits-all’ conditions to central schemes and making them conditionally applicable to States only on States agreeing to contribute up to 50% of the schemes budgeted expenditure.
- **Misapplication of Financial powers** – Weaponisation of money in the central kitty by providing financial support as a quid pro quo for advancing the political agenda of the party at the Centre.
 - **For Instance**, the recent transfer of ₹10,000 to 1.21 crore women in Bihar very close to the Bihar Assembly election 2025 or the grant of a special financial package for Andhra Pradesh in the last Budget are two recent examples.
- **Misuse of institutions** – The misuse of the Central Bureau of Investigation/Enforcement Directorate/Income-Tax Department to raid, browbeat, arrest Chief Ministers and Ministers and bring down Opposition governments.
- **Control through governor** – The central control through the Governor’s fiat, which will collapse the spirit of federalism.

What lies ahead?

- If this deep distortion of federalism is permitted to take root, the Union Government will command unrestrained authority while States are reduced to mere administrative outposts.
- Democracy cannot survive where the will of the people is held hostage to the whims of unelected constitutional functionaries.
- It is imperative that citizens take notice, institutions reflect, and the Supreme Court reconsiders.
- Because the preservation of federalism is the preservation of India itself.
- In the journey of every nation, there comes a moment where institutions must stand up as solid guardrails to defend what is intrinsic to the foundational values of the nation-state.
- Because, if the foundational principles are allowed to crumble, the remaining structure will wither away.
- Further, the institutions which sanction such an obliteration of core ideas, almost always meet the same end.
- Once the tree falls, the branches cannot survive.

6. GOVERNMENT POLICIES AND INTERVENTIONS

6.1 PM SHRI – Tussle between Funds and ideologies

Recently, Kerala became a signatory to the Union government’s flagship PM SHRI (Prime Minister’s Schools for Rising India) scheme after three years of holding out, and paused the scheme due to lack of consensus among their coalition parties.

What is PM - SHRI scheme?

- **Announced on** – The scheme was announced by the Prime Minister on National Teachers’ Day in 2022.
- **Scheme** – Centrally sponsored scheme, which seeks to develop over 14,500 existing schools, including Kendriya Vidyalayas (KVs) and Jawahar Navodaya Vidyalayas (JNVs), across the country as model institutions that showcase the National Education Policy (NEP) 2020.
- **Vision** – The PM SHRI schools are envisioned to meet the “*demands of the 21st century.*” notes the scheme’s ‘Framework on school transformation’.
- With upgraded infrastructure and innovative pedagogy and technology, the schools are meant to create “*well-rounded individuals equipped with key 21st century skills.*”
- **Objective** – The objective of PM SHRI is to ready schools in which “every student feels welcomed and cared for,
 - Where a safe and stimulating learning environment exists,
 - Where a wide range of learning experiences are offered,

- Where good physical infrastructure and resources conducive to learning are available to all students.
- The scheme is designed to benefit more than 18 lakh students directly.
- Mentoring of schools in the vicinity of PM SHRI schools is expected to benefit many more students.
- **Budget** – The total outlay of the project is Rs.27,360 crore (Central share of Rs.18,128 crore and State/UT share of Rs.9,232 crore in 60:40 pattern), spread over a period of five years till March 2027.
- **Funding ratio** – The Union government will provide 90% of the funding for northeastern and Himalayan States and the UT of Jammu and Kashmir, and 100% for UTs that do not have legislature.
- **Schools selected** – According to the PM SHRI dashboard, 13,070 schools have been selected for the scheme nationwide and of them, 1,533 are KVs and JNVs.
- Only existing elementary and secondary/senior secondary schools managed by the Union/State/UT/local self-governments and having Unified District Information System for Education Plus (UDISE+) code are selected for the scheme.
- **Stages of selection** – The selection is done in 3 stages.
 - **1st stage** – States or UTs sign a memorandum of understanding (MoU) with the Union government agreeing to implement the provisions of NEP 2020 in “entirety”.
 - **2nd stage** – Schools that meet the minimum benchmark (on the basis of UDISE+ data) are shortlisted.
 - **3rd stage** – The shortlisted schools compete to fulfil certain criteria based on the challenge formula.
 - Their claims are verified by States or UTs through physical inspection and a list of schools is recommended to the Union Ministry of Education.
- A maximum of two schools – one elementary and one secondary/senior secondary – are selected from every block or urban local body.
- An expert committee recommends the final list of schools selected for PM SHRI in each State or UT.
- **Prefix to names** - The MoU for the PM SHRI scheme clearly states that PM SHRI has to be prefixed to name of selected schools.
- No change shall be undertaken thereafter, by the States/UTs/KVS/NVS for these schools, as these schools are to be developed as PM SHRI Schools for providing quality education.

What are the key features?

- **Inclusive Pedagogy** – In PM SHRI schools will be more experiential, holistic, integrated, learner-centred, and flexible, according to the guiding framework.
- The curriculum can follow the National Curriculum Framework/State Curriculum Framework developed in accordance with the new curricular and pedagogical structure of the NEP.
- Traditions and practices and Indian knowledge systems are part of curriculum in these schools.
- **Use of language** – The schools will use mother tongue/local or regional language for teaching and learning, particularly in the early years.
- **Key components** – The scheme has some innovative idea like:
 - Student registry to track enrolment and learning progress.
 - STEAM (science, technology, engineering, arts and mathematics) education.
 - Sports and arts for every student
 - ICT facility, smart classrooms and digital libraries, science labs, and vocational labs.
 - Early childhood care and education.
 - Competency-based learning and improvement in learning outcomes of each student.
 - A ‘*School Quality Assessment Framework*’ that measures the performance of these schools.
- The assessment framework will produce comprehensive reports to aid improvement in educational standards.
- The framework, it is mentioned, is not prescriptive but suggestive in nature.

Why some states opposing the PM SHRI scheme?

- **West Bengal** – West Bengal’s contention pertains to funding and branding.

- It asks why name the scheme PM SHRI if States have to bear 40% of the cost and have to take over the schools after five years
- **Tamil Nadu** – The state opposes the three-language formula of the NEP.
- This translates to ‘imposition of Hindi’ for the ruling government. Tamil Nadu has chosen to seek legal redress for release of nearly Rs.2,200 crore from the Union government.
- **Kerala** – It opposed PM SHRI on the grounds it showcases the NEP which, it says, is being imposed by the Union government as part of an RSS agenda, that will lead to ‘communalisation of education’ and
- Though PM SHRI was launched in 2022, the opposing states refused to agree on the scheme for reasons ranging from political opposition to the NEP and objection to adding the PM SHRI prefix to schools’ name to prioritising their own projects.
- **Punjab** – It signed the MoU in 2022 but withdrew from it a year later.
- As in the case of Kerala, withholding of funds under another Centrally sponsored education scheme Samagra Shiksha by the Union government saw the Punjab government ultimately reconsider the decision in 2024.
- Other States too gradually gave in, with lack of critical funding

What lies ahead?

- Kerala tried to defend the move saying there will be no compromise on its educational policy and values.
- The government’s attempts to walk the tightrope of prioritising the State’s needs while staying true to the ideological opposition to the NEP though ran into a wall of CPI objections, leading to the freeze on the implementation of the scheme.
- A cabinet subcommittee, which has been formed to scrutinise the MoU, will now take a call on the issue.

6.2 Transgender healthcare – Tamil Nadu Model

Recently the welfare of transgender has gain attention and Tamilnadu stands as an example for its progressive schemes and policies.

Why do transgender persons face healthcare barriers?

- **Lack of trained professionals** – Few healthcare providers are trained in transgender health, and they are often restricted to managing sexually transmitted infections or gender-affirming surgeries, neglecting the comprehensive, lifelong health needs.
- **Exclusion** – Systemic exclusion from education, housing, employment, and social security leaves many without stable income or insurance.
- **Stigma and discrimination** – In the health settings it creates hostile healthcare environments that erode trust in the health system.
- **Lack of awareness** – Poor awareness among both providers and the public, results in many transgender persons delay or avoiding the medical attention altogether.

What has Tamil Nadu done?

- **Pioneer in transgender-inclusive healthcare** – Since 2008, the Rajiv Gandhi Government General Hospital in Chennai has offered gender-affirming surgeries, supported by India’s first Transgender Welfare Board.
- This began many years before the 2019 Transgender Persons (Protection of Rights) Act mandated such services in at least one government hospital per State.
- **Gender guidance clinic** – The National Health Mission (Tamil Nadu) established Gender Guidance Clinics (GGCs) in 2018 to provide multidisciplinary care under one roof.
 - By 2025, eight districts in the State host GGCs, offering free gender-affirming procedures.
 - Between April 2019 and March 2024, 7,644 transgender individuals accessed these clinics.
- **Accessibility** – Posters in English and Tamil in GGCs emphasise non-discrimination, inclusion, privacy, and confidentiality to ensure respectful care.

How has Tamil Nadu expanded insurance coverage?

- **Integration of treatments** – Tamil Nadu has integrated gender-affirming surgeries and hormonal therapy into the Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS-PMJAY) in 2022.
- Previously funded through hospital budgets, these services are now covered under a five-year (2022-27) policy.
- Associated with the United India Insurance Company, making India the first South Asian country to include transgender care in universal health coverage.
- **Progressive scheme implementations** – The Centre's 2022 PMJAY-Ayushman Bharat TG Plus scheme offers over 50 free procedures, but Tamil Nadu's implementation, now in its fourth year, is more advanced.
- **Removed the limits** – The State government removed the ₹72,000 annual income cap for CMCHIS-PMJAY enrolment.
- **Attacking the barriers** – It waived the requirement for a ration card bearing the transgender person's name, recognising that barriers to healthcare extend beyond income to include stigma, discrimination, and family rejection.
- Based on a forthcoming WHO case study, as of October 2025, over 5,200 transgender individuals are enrolled in the scheme, with more than 600 undergoing gender-affirming surgeries or hormone therapy in 12 public and private empanelled hospitals.
- **Financial assistance** – The scheme has disbursed ₹43.8 million, preventing financial ruin for many transgender persons from costly private care.

How have policy and legal reforms strengthened this model?

- **Legal background** – The 2019 Transgender Act (Section 15) mandates comprehensive healthcare, and Tamil Nadu has begun moving the needle.
- **Policy push** – In October 2024, the National Health Mission, working with NGOs and LGBTQIA+ networks, trained doctors from GGCs on the World Professional Association for Transgender Health Standards of Care, Version 8.
- **Judicial intervention** – The Madras High Court has reinforced transgender rights through rulings on marriage, curriculum reform, banning conversion therapy and intersex surgeries, reopening GGCs post-COVID, ending police harassment, and reducing societal prejudice.
- **State policy** – The 2019 Tamil Nadu Mental Health Care Policy and the 2025 State Policy for Transgender Persons further affirm healthcare, education, and property rights.

Why does Tamil Nadu stand out?

- **UN's observation** – The study on Gender Guidance Clinics by the United Nations University-IIGH on Gender Guidance Clinics highlights how these developments are embedded in an enabling environment that has been created over decades in Tamil Nadu.
- **Social reforms** – The state has consistently been a cradle for transformative social reforms, rooted in principles of self-respect and social equity, while actively confronting pervasive gender and caste discrimination.
- **Social recognition** – The acceptance of transgender identities is evident right from the annual Koovagam Kuthandavar festival held over centuries to the recent publication of the 2022 government gazette, which adopted respectful Tamil terms for sexual and gender-diverse persons.
- **Political support** – Despite political rivalries, major political parties have championed numerous welfare initiatives to support the transgender community.

What challenges remain?

- GGCs must expand to provide comprehensive primary-to-tertiary care, publish a dedicated health manual, regularly build provider competencies and hold them accountable.
- It should regulate empanelled hospitals, progressively include mental health in benefit packages, establish grievance mechanisms, encourage research, and tackle societal bias through cross-sectoral action.
- Engaging transgender communities at all stages of policy and implementation for transgender health is non-negotiable.
- Only sustained commitment and action can transform Tamil Nadu's promising model into lasting equity for transgender persons.

7. GOVERNANCE

7.1 Elderly in India – Population, Challenges, and Government Initiatives

India is witnessing a rapid demographic transition, with the population aged 60 years and above expected to rise from 100 million in 2011 to 230 million by 2036.

Why is addressing elderly is important?

- **Shift in population trend** – By 2036, one in every seven Indians will be elderly.
- This ageing trend, driven by declining fertility and rising life expectancy, marks a profound shift in India's population composition.
- The transition presents both opportunities and challenges—ranging from economic dependency to the need for healthcare, social inclusion, and financial security.
- **Key focus areas** – This includes
 - Pension access and income security.
 - Affordable healthcare and geriatric services.
 - Adequate housing and elderly-friendly infrastructure.
 - Community-based and family-driven support systems.
- India must promote financial security, digital literacy, assistive technologies, long-term care, and the creation of a *“silver economy”*.
- This not only ensures dignified ageing but also creates employment and entrepreneurship opportunities, enabling the elderly to contribute their experience and skills to the economy.

Silver economy is centred around goods and services for citizens aged 50+.

What do demographic trends show?

- **Population Projections** – According to the Technical Group on Population Projections (TGPP) Report, July 2020, *India's elderly population will reach 230 million by 2036, accounting for about 15% of the total population.*
- **Significant regional disparities** – Southern states (Kerala, Tamil Nadu, Andhra Pradesh) and Himachal Pradesh, Punjab have higher elderly shares.
 - **Kerala** – The elderly share projected to rise from 13% in 2011 to 23% by 2036 – the oldest population in India.
 - **Uttar Pradesh** – Increase from 7% in 2011 to 12% by 2036, showing gradual ageing in northern states.
- **Longitudinal Ageing Study of India (LASI) 2021** – The LASI—India's largest national study on ageing—reveals:
 - 12% of India's population are elderly, projected to reach 319 million by 2050.
 - Sex ratio among elderly: 1,065 females per 1,000 males.
 - Women constitute 58% of elderly, with 54% widows.
 - Overall dependency ratio: 62 dependents per 100 working-age individuals.
- These statistics underline the growing social and economic implications of ageing, including feminisation of ageing and higher care needs.

What challenges do the elderly face?

- **Health Challenges** – High prevalence of chronic diseases, disabilities, and mental health issues (e.g., dementia, Alzheimer's).
- Limited geriatric infrastructure and poor rural healthcare access.
- Urban-rural divide in availability of hospitals and specialists.
- **Economic Challenges** – Inadequate pension coverage and social security.
- Rising living and medical costs.
- Dependence on family for financial support.
- **Social Challenges** – Erosion of joint family system, leading to isolation and neglect.
- Lack of companionship, increasing loneliness and depression.

- **Digital Divide** – Limited access to digital devices and digital literacy, excluding many elderly from online services and benefits.
- **Infrastructure Challenges** – Lack of elder-friendly public spaces, ramps, handrails, and accessible transport.
- Poor emergency response systems for elderly safety.

What are the government initiatives for the elderly in India?

- **Atal Pension Yojana (APY)** – It is aimed at Providing pension security to unorganised sector workers (18–40 years) and administered by PFRDA.
- Offers guaranteed pension from ₹1,000 to ₹5,000/month after 60 years.
- Contributions via auto-debit; Government meets shortfall if returns are low.
- 8.27 crore subscribers (as of Oct 2025); AUM: ₹49,000+ crore.
- **Indira Gandhi National Old Age Pension Scheme (IGNOAPS)** – It is a part of National Social Assistance Programme (NSAP) under MoRD.
- Provides pension to BPL elderly:
 - ₹200/month (60–79 years), ₹500/month (80+ years).
 - crore beneficiaries (as of Oct 2025).
- **Atal Vayo Abhyuday Yojana (AVYAY)** – The nodal Ministry is the Ministry of Social Justice and Empowerment (MoSJE).
- Launched to empower senior citizens and promote social inclusion.
- **Rashtriya Vayoshri Yojana (RVY)** – It provides assistive devices (walkers, hearing aids, wheelchairs, dentures) to BPL elderly or those earning ≤₹15,000/month.
- Devices made by ALIMCO, distributed via camps or doorstep delivery (for 80+).
- **Elderline (14567)** – A National Helpline offering emotional, legal, and care assistance to senior citizens.
- **Senior Care Ageing Growth Engine (SAGE) Portal** – It encourages start-ups offering elderly care products and services.
- Equity support, up to ₹1 crore per project (max 49% govt. share).
- Builds a reliable ecosystem for elderly-care innovation.
- **Senior Able Citizens for Re-Employment in Dignity (SACRED) Portal** – It connects citizens above 60 years with employers for re-employment and consultancy.
- Promotes financial independence and productive ageing.
- **Ayushman Bharat** – PM Jan Arogya Yojana (AB-PMJAY)
 - Offers ₹5 lakh annual health coverage per family for secondary and tertiary care.
 - Expanded (Oct 2024) to cover 6 crore senior citizens (70+ years) irrespective of income.
 - Over 40 lakh elderly enrolled by Jan 2025.
- **National Programme for Health Care of the Elderly (NPHCE)** – it is launched to provide affordable geriatric healthcare at all levels.
 - Covers 713 health districts with dedicated geriatric OPDs, 10-bedded wards, physiotherapy, and labs.
- **Geriatric Caregiver Training** – It is conducted by National Institute of Social Defence (NISD).
 - As of 2023–24: 32 institutes empanelled, training 36,785 caregivers in clinical and non-clinical elderly care.
- **Welfare Funds and Policy Framework** – Senior Citizens Welfare Fund (SCWF)
 - Established under Finance Act, 2015.
 - Utilises unclaimed funds (from PPF, insurance, EPF, etc.) for elderly welfare schemes.
 - Managed by MoSJE, aligned with National Policy for Senior Citizens.
- **Maintenance and Welfare of Parents and Senior Citizens Act, 2007 (Amended 2019)** – It legally mandates children/heirs to maintain parents.

- 2019 Amendment expanded the scheme:
 - Broadened definition of "children" and "parents".
 - Removed ₹10,000 ceiling on maintenance.
 - Introduced homecare services, nodal police officers, and district-level Special Police Units.
 - Required hospitals to reserve beds and queues for senior citizens.

How is technology supporting the elderly?

- **Role of technology** – Technology plays a vital role in healthcare, safety, and inclusion for older adults:
 - Telemedicine through e-Sanjeevani for home-based consultations.
 - Wearable devices to monitor vital signs and send emergency alerts.
 - Smart home technologies and surveillance tools for safety and independence.
 - Online pharmacies ensure access to medicines at home.
- Such innovations make ageing more connected, dignified, and independent.
- **Social and Community Support** – Family remains the core pillar of elderly care in India.
- However, urbanisation and migration have eroded traditional caregiving systems.
- Community-based initiatives and intergenerational programmes can combat loneliness and strengthen social inclusion.
- The NAITIK PATAM game, launched in 2025, promotes respect and bonding between generations.
- **Housing and Urban Design for the Elderly** – Elder-friendly urban design ensures safety and comfort.
- The Model Guidelines for Development and Regulation of Retirement Homes (2019) encourage age-friendly housing, barrier-free architecture, and social living environments for older persons.
- **International Day of Older Persons** – It is observed annually on October 1.
- It promotes awareness about the elderly's rights, welfare, and contributions to society.

What lies ahead?

- India's silver economy, valued at ₹73,000 crore (2024), is set for exponential growth. With the 45–64 age group emerging as the wealthiest global cohort, opportunities abound in senior care, health services, and assistive technologies.
- India must recognise senior care as a specialised sector with regulatory frameworks.
- There is a need to foster public-private collaboration for healthcare and welfare delivery.
- We need to strengthen inter-ministerial coordination among MoSJE, MoHFW, MoRD, and others.
- We should encourage community and Panchayati Raj participation for last-mile service delivery.
- A holistic approach combining policy, technology, healthcare, and empathy will ensure that India's elderly population leads a life of dignity, security, and active participation in nation-building.

7.2 Pay Commission – Role and Mandate

Recently, the Central government has constituted the 8th Central Pay Commission (CPC) with retired Justice Ranjana Prakash Desai as the Chairperson.

What is a pay commission?

- **Establishment** – Pay commissions are set up in India by an executive order based on a Cabinet decision.
- **Role** – The role of the CPC is to go into various issues of salary structures, retirement benefits and other service conditions of Central government employees, including defence personnel, and make suitable recommendations on the changes required.
- **Historical background** – The first CPC was set up in 1946.
- **The Terms of Reference (TOR)** – The TOR of the pay commissions are finalised by the Union Cabinet.
- The TOR include:

- Economic conditions of the country and the need for fiscal prudence
- Need to ensure adequate resources for developmental expenditure and welfare measures;
- Unfunded cost of non-contributory pension schemes;
- Impact of recommendations on State government finances that usually adopt the recommendations of the CPC.
- The prevailing emolument structure and working conditions available for central public sector undertakings and private sector employees.

What are the international practices and Indian situation?

- **Compensation system** – Globally, till the 1970s, the compensation system for the public sector was aimed at achieving equity by benchmarking them with similar roles in the private employment market.
- **Efficiency** – In the 1980s, efficiency replaced equity as the key principle in determining compensation.
- **Performance** – Starting with the 1990s, performance and incentives became the key principle while balancing them with affordability.
- **Skills and competency** – At present, public sector compensation systems are evolving to recruit and retain individuals with appropriate competencies and skills, while attempting to contain the total cost to the public exchequer.
- As per global standards the key characteristics of fair compensation in the public sector are clear philosophy, ability to attract talent, internal equity, external competitiveness and clarity.
- **Indian scenario** – In India while internal equity is given adequate weightage, external competitiveness lags behind when it comes to compensation for top positions.
- It is interesting to note some comparative data for large democracies on certain parameters of public sector employment *summarised in Table 1.*

Comparison of public sector employment and expenditure			
Country	Public sector wage bill (% of GDP)	Public sector wage bill (% of total expenditure)	Public sector employment (% of total employment)
India	5.48	17.70	8.5
U.S.	9.50	20.58	12.9
U.K.	10.20	20.29	29.0
France	13.37	21.43	31.5
Germany	8.51	16.46	22.4
Brazil	10.65	24.92	12.5

Source: World Bank – World Bureaucracy Indicators - 2022

- It can be observed that while the general perception in our country is that public sector employment and wages are huge with limited efficiency, it is lesser in almost all parameters when compared to other major democracies.

What lies ahead?

- **Comparison of public and private** – The TOR requires the CPC to compare the pay structure of the public sector with the private sector.
- This has been addressed even in earlier pay commissions.
- Entry level posts in the public sector have significantly higher salaries than their private counterparts while it is the opposite for higher posts and specialist roles.
- The compression ratio, that is, the ratio of lowest to highest salaries in the Central government has been fixed at 1:12.5 in the seventh CPC.
- Privileges and perks coupled with job security is a significant intangible that makes up for lower salary packages in top government posts.

- However, this needs to be revisited with respect to certain top posts and specialist roles in order to attract and retain talent.
- **Inclusion of other factors** – Intangibles like learning and development, training, and work environment including flexible working and health promotion are not part of the TOR.
- It may be expected that the Commission will address these issues in its final report.
- Finally, the 8th CPC has been mandated to consider economic conditions, need to ensure adequate resources for welfare, and unfunded cost of non-contributory pension schemes.
- **Impact on exchequer** – The pension bill for the year 2025-26 is estimated at ₹2.76 lakh crore out of the total revenue expenditure of ₹39.44 lakh crore of the central government.
- The impact of non-contributory pension schemes on the government exchequer needs to be borne in mind while making recommendations.
- However, welfare measures are political decisions that keep evolving.
- New schemes are announced by the Centre from time to time.
- Considering these factors, a commission with members from the judiciary, academia and bureaucracy may not be equipped to assess the impact.
- There may also be a case for broad basing the commission with finance and human resource professionals to bring in diverse opinions.

7.3 Governance Guidelines for AI

Recently, The Ministry of Electronics and Information Technology (MeitY) has unveiled governance guidelines for Artificial Intelligence (AI), which could serve as a blueprint for how India regulates the technology, balancing innovation with accountability and growth with safety.

How guidelines were prepared?

- **Experts committee** – The guidelines were drafted by a high-level committee consisting of policy experts under the chairmanship of Prof. Balaraman Ravindran, IIT Madras.
- The committee went through extensive deliberations and prepared a draft report, which was opened for public consultation.
- **Guiding principle** – The guiding principle that defines the spirit of the framework is... ‘*Do No Harm*’.
- **Main focus** – The key focus is on creating sandboxes for innovation and on ensuring risk mitigation within a flexible, adaptive system.”
- **Action Plan on AI**

EMPOWER THE India AI mission, ministries, sectoral regulators and state governments to increase AI adoption, through initiatives on infrastructure development and increasing access to data and computing resources

level of risk, and whether due diligence was observed

INCREASE DATA availability, sharing, and usability for AI development and adoption with robust data portability standards and data governance frameworks

ADOPT A graded liability system based on the function performed,

INTEGRATE AI with Digital Public Infrastructure (DPI) to promote scalability, interoperability and inclusivity

ENCOURAGE THE use of locally relevant datasets to support the creation of culturally representative models

CONDUCT SAFETY testing and evaluations

What the guidelines say?

- **Infrastructure** – The report calls for expanding access to data and compute resources, including subsidised graphics processing units (GPUs) and India-specific datasets through platforms like AIKosh.
- It urges integration of AI with Digital Public Infrastructure (DPI) such as Aadhaar and Unified Payments Interface (UPI).
- It also urges the government to incentivise private investment and adoption by MSMEs, with tax rebates and AI-linked loans.

*The launch of the guidelines comes ahead of the **India–AI Impact Summit 2026**, which will be the first-ever global AI summit hosted in the Global South.*

- **Regulation** – India’s approach will be agile and sector-specific, applying existing laws (like the IT Act and the Digital Personal Data Protection Act) while plugging gaps through targeted amendments.
- The report rules out an immediate need for a standalone AI law, but calls for updates on classification, liability, and copyright, including consideration of a “text and data mining” exception. It also urges frameworks for content authentication to counter deepfakes and for international cooperation on AI standards.
- At the heart of it all is human centricity, ensuring AI serves humanity and benefits people’s lives while addressing potential harms.
- **Risk mitigation** – As stated earlier, the report proposes an India-specific risk assessment framework to reflect local realities, along with the use of voluntary frameworks and techno-legal measures.
- **Accountability** – A graded liability regime is proposed, with responsibility tied to function and risk level.
- Organisations must adopt grievance redressal systems, transparency reporting, and self-certification mechanisms.
- **Institutions** – The framework envisions a whole-of-government approach, led by an AI Governance Group (AIGG), supported by a Technology & Policy Expert Committee (TPEC), and technically backed by the AI Safety Institute (AIS).
- **Capacity building** – The guidelines emphasise AI literacy and training for citizens, public servants, and law enforcement.
- They recommend scaling up existing skilling programs to bridge gaps in smaller cities and enhance technical capacity across government institutions.

What are the questions and issues discussed?

- **Red flags** – Even as the government looks to encourage AI with little regulatory burden, there are internal red flags over data privacy and inference risks, especially when such systems are being used by key government officials.
- **Frequent questions** – There have been questions raised regarding the use of AI in governance such as:
 - What happens when a government officer uploads an internal note to an AI chatbot for a quick summary?
 - What happens when a police department asks an AI assistant to optimise CCTVs across a city?
 - What happens when a policymaker uses a conversational model to draft an inter-ministerial brief?
 - Can the AI system analyse such prompts at scale, identify the user, infer their role, draw patterns across queries and predict strategic intent?
- **Free AI usages** – Amid growing concern about the rapid proliferation of generative AI (GenAI) platforms in India, especially those run by foreign firms, often bundled as free services with telecom subscriptions.
- **Spheres of discussion** – Two broad areas are under discussion.
 - **First**, whether queries made by top functionaries – bureaucrats, policy advisers, scientists, corporate leaders and influential academics – could be mapped to identify priorities, timelines, or weaknesses.
 - **Second**, whether anonymised mass usage data from millions of Indian users could help global firms. One issue, sources said, is whether to “protect” official systems from foreign AI services.
- **Proposed AI content labelling** – As per the draft amendments to the IT Rules, released last month, social media platforms would have to get users to:
 - Declare whether the uploaded content is synthetically generated.
 - Deploy “reasonable and appropriate technical measures”, including automated tools or other suitable mechanisms, to verify the accuracy of such declaration.
 - Where such declaration or technical verification confirms that the content is synthetically generated, ensure that this information is clearly and prominently displayed with an appropriate label or notice.
- If they fail to comply, the platforms may lose the legal immunity they enjoy from third-party content,
 - It means that the responsibility of such platforms shall extend to taking reasonable and proportionate technical measures to verify the correctness of user declarations and to ensure that no synthetically generated information is published without such declaration or label.

7.4 New Labour Codes

Recently, the government on Friday (November 21, 2025) notified all four Labour Codes and they replace 29 fragmented laws, some of them dating back to 1930s.

What are the four Labour codes?

- **The four Labour Codes**
 - Code on Wages (2019),
 - Industrial Relations Code (2020),
 - Code on Social Security (2020)
 - The Occupational Safety, Health and Working Conditions (OSHC) Code (2020)
- **Need for the reform** – India’s old labour laws were too many, too complex, and outdated.
 - They increased the compliance burden and discouraged businesses from hiring.
 - Many workers, especially gig, platform, MSME, and migrant workers, had no uniform social security.
 - States had already begun reforming their labour laws, leading to fragmented rules.

• LABOUR CODES COME INTO EFFECT: WHAT WILL CHANGE

After a five-year-wait, the Centre has notified the four labour codes on wages, industrial relations, social security & occupational safety health and working conditions, effective November 21. The Ministry of Labour and Employment has detailed the key features below:



	PRE-LABOUR REFORMS	POST-LABOUR REFORMS
Formalisation of employment	No mandatory appointment letters.	Mandatory appointment letters to all workers to ensure transparency, job security, and formalisation.
Social Security Coverage	Limited social security coverage	Under the Code on Social Security, gig & platform workers will also get social security coverage
Minimum wages	Minimum wages only for scheduled industries; large sections of workers not covered	Code on Wages introduced concept of floor wage, provides workers statutory right of minimum wage payment
Preventive healthcare	No legal requirement for employers to provide free annual health check-ups to workers	Employers must provide all workers with a free annual health check-up
Timely wages	No compliance for timely payment of wages	Mandatory for employers to provide timely wages. Provides financial stability, cuts work stress and boosts overall morale of the workers
Women's workforce participation	Female employment in night shifts and certain occupations was restricted	Women to be permitted to work at night and in all types of work across all establishments, subject to their consent and required safety measures
Compliance burden	Multiple registrations, licences and returns across various labour laws	Single registration, pan-India single licence and single return

What changes will take place for different worker groups?

- **Gig & platform workers**
 - Legally defined for the first time.

- Aggregators must contribute 1–2% of turnover (capped at 5% of payouts) to a welfare fund.
- Commuting accidents are covered as employment-related.
- Aadhaar-linked UAN enables portability of benefits across states.
- **Contractual workers**
 - Health and social security benefits are ensured by the principal employer.
 - Free annual health check-ups.
- **Women workers**
 - Equal pay and prohibition of gender discrimination.
 - Consent-based night work permitted with safety protocols.
 - Up to 26 weeks maternity leave, crèche facilities, medical bonus.
 - Parents-in-law included in the family definition.
- **Migrant workers**
 - Equal wages and welfare benefits.
 - PDS portability.
 - Claims allowed for pending dues up to three years.
 - Double wages for overtime.
- **Sector-specific provisions**
 - Covers workers across MSMEs, plantations, beedi and cigar, audio-visual, textile, mines, IT, hazardous industries, ports and export hubs.
 - Major benefits include regulated working hours, double overtime, appointment letters, safety standards, ESI coverage, PPE, annual health check-ups and stronger workplace protections
- **Fixed Term Employment**
 - The Codes frame Fixed Term Employment as a tool to reduce contractualisation and increase direct employment.
 - Workers receive the same benefits as permanent staff.
 - Wages must be equal to permanent employees.
 - Gratuity eligibility starts after one year instead of five.
 - Leave, working hours and medical benefits are fully regulated.
 - The government argues that FTE promotes formalisation, shifts workers to company payrolls and expands social security coverage

What are the benefits gained from labour reforms in different states?

- **Gujarat**
 - GSDP reached ₹25.63 trillion in 2023–24, growing 13.36% year-on-year.
 - Manufacturing's share in GSDP stands at 28–30%, against the national average of 17%.
- **Punjab**
 - GSDP grew at a CAGR of 9.43% between FY16 and FY24.
 - Expected to touch ₹8.02 lakh crore in FY25.
 - Attracted ₹1.25 lakh crore in investments, expected to generate 4.5 lakh jobs.
- **Bihar**
 - GSDP projected at ₹9.76 lakh crore in 2024–25, a 13.5% rise over the previous year.
- **Maharashtra**
 - India's highest GSDP at ₹42 lakh crore in 2024–25.
 - 5.5% annual growth.
 - ₹1.4 lakh crore in new investments in the past year.

- Organised manufacturing workforce grew by 3 lakh between 2010–11 and 2017–18.
- **Uttar Pradesh**
 - Organised manufacturing employment up by 7.4 lakh workers (2014–15 to 2023–24).
- **Andhra Pradesh**
 - GSDP for 2024–25: ₹16.41 lakh crore (12.5% growth).
 - Investor summits: ₹13.25 lakh crore proposals, 16 lakh projected jobs.
 - Electronics hubs in Sri City and Koppaerthy linked to 5,000–7,000 jobs.
 - Organised manufacturing employment rose by 5.7 lakh — the highest among states.
 - Increase of 7.1 percentage points in factories employing 300+ workers.
- **Haryana**
 - Tertiary-sector employment share rose from 38.8% to 41.9% between 2017–18 and 2019–20.
 - Unemployment fell from 9.3% to 3.4% between 2018–19 and 2023–24.
- **Rajasthan**
 - Raised thresholds led to 25–30% faster growth in factories employing over 100 workers, compared to the national average.
 - Factory output rose by 20–25%.
 - Organised manufacturing employment increased by 1.22 lakh (2010–11 to 2017–18).
 - Share of employment in large plants (300+ workers) rose from 40.9% to 51.2%.
 - Allowing women to work night shifts resulted in:
 - 3.5% increase in the share of female workers
 - 13% rise in the number of female employees
 - 6.5% higher likelihood of firms employing women.

7.5 Insurance Delays and Access to Bariatric Surgery

Recently, a survey conducted by the Obesity and Metabolic Surgery Society of India (OSSI, has revealed significant insurance-related hurdles that are preventing timely and life-saving care for patients living with severe obesity.

What is the study?

- **Conducted by** – Obesity and Metabolic Surgery Society of India (OSSI).
- **OSSI** – It is a not-for-profit body of bariatric and metabolic surgeons
- OSSI survey highlights approval delays, IRDAI coverage gaps and bariatric surgery insurance hurdles.
- **Title** – The study titled *'The Surgeons' Perspective on Insurance Coverage for Metabolic and Bariatric Surgery for India'* is published in *Obesity Surgery: The Journal of Metabolic Surgery and Allied Care*.
- **IRDAI mandate** – The Insurance Regulatory and Development Authority of India (IRDAI) mandated coverage for metabolic and bariatric surgery in 2019 when medical criteria are met.
- The OSSI survey, conducted among 109 bariatric surgeons across multiple states between November 2024 and March 2025, paints a stark picture.

What are the Survey findings?

- **Criticality of obesity** – Doctors stress that obesity is not a lifestyle flaw, but a chronic, progressive condition linked to type 2 diabetes, hypertension, sleep apnoea, heart disease, infertility, and certain cancers.
- **Bariatric and metabolic surgery** – It can reduce body weight by 30 to 40% and reverse many associated illnesses, is among the most effective treatments.
- Yet, limited insurance support leaves many patients untreated or waiting for months.
- **Delayed insurance approval** – 95.4% of surgeons reported patients delaying surgery while awaiting insurance approval.

- **Lack of awareness** – Most surgeons (76.1%) said patients are unaware that insurance covers bariatric surgery even when medical criteria are met.
- **Complex approval process** – The approval process was rated complex by 69.7%, and 91.7% said it is more cumbersome than other routine surgeries.
- **Large denial rate** – Nearly one-third reported denial rates of 50 to 75%, citing obesity exclusions, waiting periods, and documentation discrepancies.
- **Increasing expenditure of people** – 81.7% noted significant out-of-pocket costs despite insurance.
- **Implementation barriers** – The survey shows implementation remains inconsistent, creating barriers that delay treatment, worsen complications, and increase long-term healthcare costs.
- **Rising obesity burden** – India's obesity prevalence is projected to triple by 2040.

What are the measures suggested?

- **Lowering BMI threshold** – Surgeons strongly supported lowering BMI thresholds and covering more comorbidities than currently listed under IRDAI rules.
 - OSSI guidelines recommend surgery for patients with BMI ≥ 35 kg/m² or >30 kg/m² with comorbidities.
 - IRDAI restricts coverage to BMI ≥ 40 kg/m² or ≥ 35 kg/m² only with severe comorbidities.
- **Improving accessibility** – Insurance providers should understand that obesity is a medical disease and that treatment should be easily accessible.
- **Process simplification** – Simplifying the process and widening eligibility criteria will help thousands of individuals who are fighting serious weight-related illnesses.
- **Other measures** – Insurers should act with clarity and compassion,
 - Including obesity-related conditions like type 2 diabetes,
 - Reducing unnecessary documentation can make a huge difference.

What lies ahead?

- Bariatric and metabolic surgery is not cosmetic, it is a scientifically proven, disease-modifying treatment that prevents long-term complications.
- Insurance coverage is not a privilege, it is a medical necessity that saves lives.
- Addressing these gaps through simpler approvals, wider eligibility, and stronger awareness can improve access to life-saving treatment and strengthen India's public health landscape.
- Early access to bariatric and metabolic surgery not only improves patient health but also reduces long-term healthcare costs for families and insurers.

8. INTERNATIONAL RELATIONS

8.1 High Seas Treaty – The Challenges Ahead

The High Seas Treaty was ratified by over 60 countries in September and it will now be enforced in January 2026.

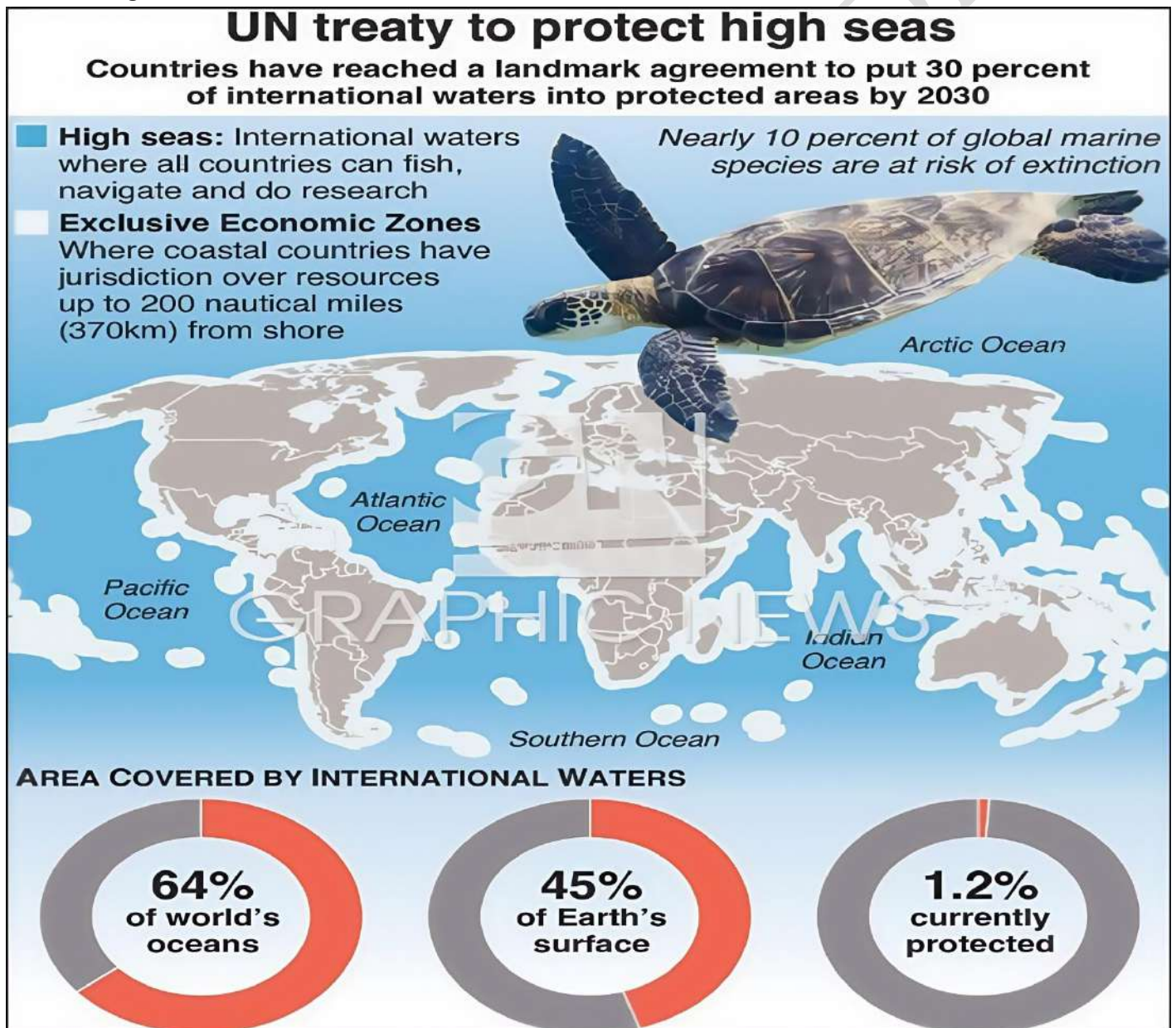
What is the treaty about?

- **High seas treaty** – It is formally referred to as *The Biodiversity Beyond National Jurisdiction (BBNJ) agreement*.
- It creates an all-inclusive framework to govern and manage common marine biodiversity.
- **Rules** – The treaty sets rules to preserve and use marine biodiversity sustainably and addresses threats from climate change, overfishing and pollution.
- **Background** – In 2004, the UN General Assembly formed an ad-hoc working group to fix the gap in the UN Convention on the Law of the Sea (UNCLOS), 1982, which did not have clear guidelines on protecting BBNJ.
- By 2011, states had agreed to negotiate on four key issues, mainly *MGRs, ABMTs, EIAs, and capacity building and technology transfer*.
- Following this, four Intergovernmental Conference sessions were held between 2018 and 2023.

- The parties to these discussions finally reached an agreement in March 2023, which led to the adoption of the treaty in June 2023.

What are the tools and mechanism for sustainable governance?

- **Marine Genetic Resources (MGRs)** – It is recognised as the *“common heritage of humankind.”*
- It includes genetic material from marine plants, animals, and microorganisms that can be used for scientific and commercial purposes, including pharmaceuticals and biotechnology.
- **Area-Based Management Tools (ABMTs)** – The treaty allows for the creation of Marine Protected Areas (MPAs) to conserve biodiversity hotspots and critical ecosystems.
- These zones will be identified using a mix of scientific data and traditional knowledge.
- **Environmental Impact Assessments (EIAs)** – Any activity likely to affect the marine environment, especially with cumulative or transboundary impacts, must undergo a mandatory EIA.
- This ensures preventive measures are taken before potential damage occurs.
- **Capacity Building and Technology Transfer** – Recognising the technological disparity between developed and developing nations, the treaty encourages capacity building to ensure equal participation in ocean research and governance.



What are the major issues?

- **Vagueness in the principles** – The uncertainty over the principles of “common heritage of humankind” and “freedom of the high seas.”

- The “common heritage principle” supports equitable access and benefit-sharing of marine resources for all, while the “freedom on the high seas” stresses on unrestricted rights of states to carry out navigation, resource usage and research activities.
- However, the common heritage principle is only applicable partially, especially when it comes to MGRs.
- This shows a compromise instead of a resolution. It also creates ambiguity in exploration, research and benefit sharing.
- **Use of MGRs** – The governance of MGRs was earlier not defined, raising concerns over “biopiracy” and unfair exploitation by developed countries.
- Developing nations were concerned that they would be excluded from the profits of scientific discoveries from the high seas.
- The treaty now includes a framework on sharing monetary and non-monetary benefits, but with no clear details on how such benefits will be calculated or shared.
- **Unwillingness of big powers** – The treaty is under threat due to non-participation from the U.S., China, and Russia, who are yet to ratify the treaty.
- **Interaction with multilateral institutions** – The treaty must coexist and not ignore existing international institutions, such as the International Seabed Authority (ISA) and Regional Fisheries Management Organisations (RFMOs).
- The BBNJ agreement must also blend with existing international treaties to prevent legal conflicts and lead to more fragmentation of ocean governance.

What next?

- There is a need for dynamic management of MPAs, and regular monitoring.
- To deliver the BBNJ, linking climate-biodiversity with the ocean will be crucial for resilient management.

8.2 National Cooperative Development Corporation (NCDC)

Recently, the government has increased the funding and schemes for the cooperative sector to further develop it and increase the number of cooperatives in the country.

What is National Cooperative Development Corporation (NCDC)?

- **(NCDC)** – It is a statutory organisation under the Ministry of Cooperation, Government of India, established in 1963.
- **Objectives** – The objectives of NCDC include:
 - Promoting, strengthening, and developing farmer cooperatives for increasing production, productivity and instituting post-harvest facilities
 - Providing assistance for development of cooperatives in sectors of processing, storage, cold chain and marketing of agriculture produce and the supply of seeds, fertilizer and other agricultural inputs etc.
- **Functions of NCDC**
 - NCDC supports income-generating cooperatives across various non-farm sectors such as weaker section activities.
 - This includes dairy, livestock, handloom, sericulture, poultry, fishery, scheduled caste & scheduled tribes, women cooperatives etc.
 - NCDC provides financial assistance to the cooperative sector for their economic development and social upliftment through NCDC Sponsored schemes and various GoI schemes implemented by NCDC

What are the schemes and efforts of NCDC?

- **Yuva sahaakar**-cooperative enterprise support and innovation scheme – Launched in FY 2019–20, the scheme is designed to promote cooperative start-ups across diverse sectors by supporting newly formed cooperatives with innovative ideas.
- The scheme encourages Young (*Yuva*) Entrepreneur Cooperative Societies that are in operation for a minimum of 3 months.

- It is linked to a Cooperative Start-up and Innovation Fund created by NCDC, with preferential support extended to cooperatives in the North Eastern Region, those operating in Aspirational Districts identified by NITI Aayog, and cooperatives comprising exclusively women, SC, ST, or PwD members.

- **Eligibility**

- Any type of cooperative society with new, innovative, and value chain enhancement intended projects.
- It should be in operation for a minimum of 3 months.
- It should have a positive net-worth.
- It should not have incurred cash loss during previous year(s) of operation, as applicable, and no cash loss in the past three years (if the society is in operation for more than 3 years).

- **Ayushman Sahakar** – It adopts a holistic approach to strengthening the healthcare ecosystem through cooperative institutions.

- It aims to assist cooperative societies:

- To provide affordable and holistic healthcare through hospitals/ healthcare/ education facilities by cooperative societies,
- To promote AYUSH facilities by cooperative societies,
- To meet the objectives of the National Health Policy,
- To participate in the National Digital Health Mission,
- To provide comprehensive healthcare including education, services, insurance, and activities related thereto.

- **Eligibility**

- Any Cooperative Society registered under any State/Multi-State Cooperative Societies Act in the country, with a suitable provision in the bye-laws to undertake services related to hospital/healthcare/health education.

- **Dairy Sahakar** – It aims to strengthen dairy cooperatives by offering financial assistance for both new projects and the modernization or expansion of existing infrastructure.

- The scheme supports end-to-end dairy sector activities, including bovine development, milk procurement and processing, quality assurance, value addition, branding, packaging, marketing, transportation, storage, and export of dairy products.

- Additionally, NCDC extends financial support to a range of related services and enabling activities such as:

- Renewable energy adoption,
- ICT solutions,
- Cattle feed and supplement manufacturing,
- Research and development,
- Packaging material manufacturing,
- Manufacturing of dairy equipment and machinery,
- Dairy-related maintenance services & Manufacturing of veterinary drugs,
- Delivery of veterinary healthcare services,
- Education and capacity development in the veterinary/dairy education.

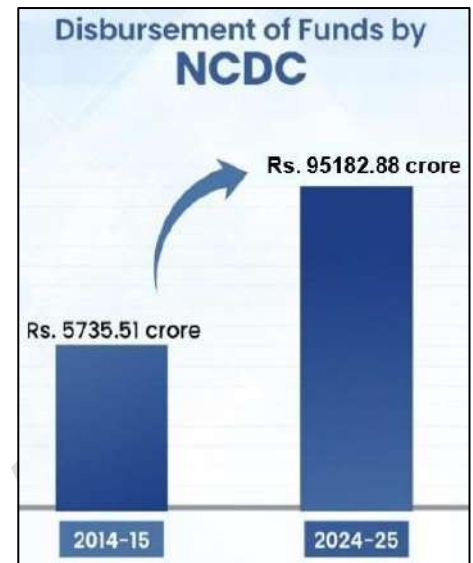
- **Eligibility**

- Any Cooperative Society registered under any State/Multi-State Cooperative Societies Act in the country, with a suitable provision in the bye-laws.

- **Digital Sahakar** – The scheme, operational since 2021-22, is aligned with the vision of Digital India.

- It provides financial and technical assistance to promote digitally empowered cooperatives, ensuring better credit access and facilitating seamless linkage with government grants, subsidies, and incentives.

- **Eligibility**



- Any Cooperative Society registered under any State/Multi-State Cooperative Societies Act is eligible for financial assistance under the scheme.
- FPOs, FFPOs, and federated SHG cooperatives are also eligible. Assistance is provided by NCDC either directly to the cooperatives or through State Governments/ UT Administrations.
- **Deerghavadhi Krishak Punji Sahakar Yojana** – It offers long-term financial assistance to agricultural credit cooperatives.
- It enables them to extend credit for a wide range of agricultural activities, commodities, and services falling under the NCDC's mandate:
- To ensure increased and uninterrupted credit flow to cooperatives and their members.
- To boost capital formation in the agriculture and allied sectors.
- To support non-farm sector activities, thereby promoting alternate employment opportunities in rural and semi-urban areas.
- **Eligibility** – The following types of Agricultural Credit Cooperatives will be eligible for NCDC's loan under this scheme:
 - Primary Agricultural Credit Cooperatives (PACS)
 - District Central Cooperative Banks (DCCBs)
 - State Cooperative Banks (StCBs)
 - Primary Cooperative Agriculture & Rural Development Banks (PCARDS)
 - State Cooperative Agriculture & Rural Development Banks (SCARDS)
- **Support to Women Cooperatives** – National Cooperative Development Corporation (NCDC) is also implementing the exclusive schemes for women cooperatives: a. Swayam Shakti Sahakar Yojana, and b. Nandini Sahakar. These initiatives play a significant role in empowering women and strengthening their contribution to rural economic development.
- **Swayam Shakti Sahakar Yojana** – The scheme, launched in the FY 2022-23, provides financial assistance to agricultural credit cooperatives for extending loans and advances to women self-help groups (SHGs).
- Under this scheme, Primary Agricultural Credit Societies (PACS), District Central Cooperative Banks (DCCBs), State Cooperative Banks (StCBs) and SHGs Federated Cooperatives/Cooperative Federations are eligible for loan from NCDC.
- By enhancing access to credit, the scheme plays a key role in strengthening women's participation in rural economic activities.
- **Nandini Sahakar** – It aims to empower women by promoting their participation in cooperatives.
- It helps women-led cooperatives by providing support in business planning, enterprise development, capacity building, and access to finance through credit, subsidies, and interest subvention from other government schemes.
- The scheme has been in operation since the financial year 2020-21.
- **Eligibility**
 - Any Women Cooperative Society registered under any State/Multi-State Cooperative Societies Act in the country is eligible.
 - Any cooperative society with a minimum of 50% women members at the primary level is also eligible.
 - In case of projects related to new and/ or innovative activities, women cooperatives that are in operation for at least three months are also eligible for assistance.

Successful Cooperative Models of India

- Gujarat State Cooperative Marketing Federation Limited (GUJCOMASOL) in Gujarat.
- The Lahoul Potato Growers Cooperative Society in Himachal Pradesh.
- The Jharkhand Women's Self-Supporting Poultry Cooperative Federation.
- The Vitthalrao Shinde Sahakari Sakhar Karkhana in Maharashtra.

What are the schemes of other ministries?

- **Implemented by NCDC** – The Corporation also implements several Central Sector and Centrally Sponsored schemes of the Government of India,
- It supports the holistic development of cooperative institutions across sectors, including agriculture, horticulture, fisheries, dairy, livestock, food processing, marketing, storage, and cold chain infrastructure.



Schemes of Other Ministries / Departments Being Implemented By NCDC



<p>Agricultural Marketing Infrastructure (AMI) and Agriculture Infrastructure Fund (AIF): Creates storage, marketing facilities and providing credit interest subvention for agri-infrastructure projects for farmers under the Ministry of Agriculture and Farmer's Welfare.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">1</p>	<p>Formation and Promotion of 10,000 FPOs: Under Ministry of Agriculture and Farmer's Welfare.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">6</p>
<p>Mission for Integrated Development of Horticulture (MIDH): Promotes post-harvest management under the Ministry of Agriculture and Farmer's Welfare.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">2</p>	<p>Pradhan Mantri Kisan Sampada Yojana (PMKSY): Promotes food processing, value addition, and cold chain infrastructure under Ministry of Food Processing Industries.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">7</p>
<p>Sub-Mission for Seed and Planting Material (SMSP) of National Mission on Agricultural Extension and Technology (NMAET): Enhances seed production and quality planting material.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">3</p>	<p>National Scheduled Tribes Finance and Development Corporation (NSTFDC): Provides financial aid to tribal cooperatives under Ministry of Tribal Affairs.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">8</p>
<p>Pradhan Mantri Matsya Sampada Yojana (PMMSY): Supports fisheries development and allied activities under Ministry of Fisheries, Animal Husbandry and Dairying.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">4</p>	<p>National Livestock Mission (NLM) and Rashtriya Gokul Mission (RGM): Improves livestock and dairy productivity under Ministry of Fisheries, Animal Husbandry and Dairying.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">9</p>
<p>PM Formalisation of Micro Food Processing Enterprises (PMFME): Strengthens small food processing units under Ministry of Food Processing Industries.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">5</p>	<p>Re-aligned Animal Husbandry Infrastructure Development Fund (AHIDF): Under Ministry of Fisheries, Animal Husbandry and Dairying.</p> <p style="text-align: right; font-weight: bold; background-color: #0056b3; color: white; padding: 2px;">10</p>



Source: Ministry of Cooperation



What are the recent developments in cooperative sector?

- **Grant-in-aid support to NCDC** – The Union Cabinet has approved a Central Sector Scheme “*Grant in aid to National Cooperative Development Corporation (NCDC)*” with a total outlay of Rs.2,000 crore for the period 2025–26 to 2028–29.
- Under this scheme, Rs.500 crore will be released annually, enabling NCDC to leverage these grants and mobilise nearly Rs.20,000 crore from the open market over the four-year period.
- This enhanced financial capacity will help NCDC to extend loans to cooperative societies for setting up new ventures, expanding existing plants, and meeting their working capital requirements.
- **National Cooperative Society Policy** – The National Cooperation Policy (NCP) 2025 sets out a clear vision for revitalising India’s cooperative movement in line with the nation’s goal of becoming *Viksit Bharat* by 2047.

- Guided by the spirit of *Sahkar-se-Samridhi*, the policy seeks to strengthen the cooperative framework, promote inclusive economic growth, and empower rural communities through collective participation.
- It focuses on building a supportive legal, economic, and institutional environment that enables cooperatives to become transparent, technology-driven, and professionally managed enterprises.
- The initiative is being implemented by the National Cooperative Development Corporation (NCDC) in collaboration with seven major cooperative institutions.
- **7 major institutions** – IFFCO, NAFED, Amul, KRIBHCO, NDDDB, NCEL, and NABARD-fostering cooperation among cooperatives to drive sustainable development.

8.3 COP30 – Concerns and Priorities of South Asia

Recently, the COP30 has begun to discuss the future climate goals and the concerns of south Asia is very crucial to discuss.

What is COP30?

- **COP** – UN Climate Change Conferences (or COPs) take place every year, and are the world's only multilateral decision-making forum on climate change that brings together almost every country on Earth.
- COP is where the world comes together to agree on the actions to address the climate crisis, such as:
 - Limiting the global temperature rise to 1.5 degrees Celsius
 - Helping vulnerable communities adapt to the effects of climate change
 - Achieving net-zero emissions by 2050.
- **Participants** – COP30 will bring together
 - World leaders and negotiators from the member states (or Parties) of the UN Framework Convention on Climate Change (UNFCCC), with business leaders,
 - Young people,
 - Climate scientists,
 - Indigenous Peoples, and
 - Civil society
- They share insights and best practices to strengthen global, collective and inclusive climate action.
- **COP30** – It stands for the 30th meeting of the Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC), a landmark international treaty agreed in 1992, and parent treaty to the 2015 Paris Agreement
- It is taking place in Belém, Brazil from 10 to 21 November 2025.

What are the priorities and concerns of south Asia?

- **Implementation issues** – The gap between what is promised in action and finance, and what is delivered, is glaring.
- Whether it is in implementing the Nationally Determined Contributions (NDCs) or delivering finance, the challenge remains.
- So far, only 65 countries have submitted enhanced NDCs.
- A recent study by the Council on Energy, Environment, and Water (CEEW) revealed that out of the 203 initiatives assessed (launched since 2015), approximately 5% of the initiatives have achieved their stated goals.
 - **Need** – There is a need for the Global South to harness regional cooperation to create impactful and targeted initiatives.
 - Climate pledges require robust governance, including a clear plan and timeline for reporting progress.
- **Regional cooperation** – Willing countries can, first, strengthen a regional forum to build a common stance and advance shared action that can be recognised at platforms such as:
 - The G-20
 - The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)

- BRICS.
- Strengthen regional cooperation by sharing knowledge, aligning priorities and scaling technology solutions across borders.
 - **Model initiatives** – India’s Coalition for Disaster Resilient Infrastructure (CDRI) and Nepal’s Sagarmatha Sambaad focused on mountain vulnerabilities, show how focused partnerships can advance both national and regional goals.
- According to the ADB, South Asia could experience an increase in days exceeding 35°C – from around 100 to approximately 200 annually – by 2100.
- The region-specific economic and non-economic impacts are diverse
 - Nepal’s glacial lake outburst flood,
 - Coastal threats in the Maldives,
 - India facing sweltering heatwaves,
 - Sri Lanka’s emerging drylands and water stress.
- Hence, governance structures should be inclusive, giving voice to the underrepresented, such as subnational governments, local communities and women.
- **Building trust** – The past is marred by delayed finances, broken promises and diluted commitments from developed countries.
- The current geopolitics is not conducive to an ambitious climate outcome.
- Further, an easy exit from a climate agreement not only leads to increased emissions but also undermines trust in the process.
- Analysis by the CEEW shows that developed countries are not on track to meet their 2030 NDC target.
- Hence, developed countries must fulfil their existing pledges and build momentum with ambitious NDCs aligned with 1.5°C, reinstating faith in multilateralism.
- **Streamlined financing** – Deliver climate finance that is
 - Predictable (sustainable funding),
 - Adequate (meets the needs and balanced with mitigation),
 - Fairly distributed
 - Accessible (easy, low-transaction cost access with priority for vulnerable countries),
 - Non-debt inducing (grants and highly concessional financing instruments).
- For this, the *Baku to Belém Roadmap to 1.3T* (\$1.3 trillion) must be underpinned by clear pathways – who delivers, how much, by when, and with what accountability.
- Without clarity, the \$300 billion adaptation target by 2035 is meaningless.
- South Asian countries, particularly the Least Developed Countries, must call for a tripling of adaptation finance with operational clarity.
- Dedicated regional allocations from multilateral funds such as the Green Climate Fund, the Loss and Damage Fund, and the Adaptation Fund can simplify and amplify access to predictable finance.
- Most importantly, design and launch a ‘*South Asian resilience finance facility*’ to mobilise and channel innovative finance to support domestic priorities and fast-track nature-based solutions.
- **Inclusion of non-state actors** – Non-state actors such as sub-national entities, the private sector, civil society, youth, academic institutions, as well as businesses can supplement state efforts toward enhancing ambition.
 - **The private sector** - Can unlock finance.
 - **Sub-national entities** – Can align with domestic goals and deliver.
 - **Civil society** – Can conduct independent assessments to expedite the process of bridging domestic capacity gaps regionally.
 - They can develop a regional compendium to share promising traditional knowledge, practices, and systems across the region.

- **Youth** – Can mobilise urgency, innovation and intergenerational equity into climate solutions.
- **Businesses** - Can mainstream sustainability into markets and value chains.
- If done rightly, it can reinforce a cycle of verified action that builds trust and accountability within the multilateral climate governance.
- **Technology flows** – Most of the South Asian countries are still largely excluded from international technology flows.
- A recent report by the CEEW shows less than one in three initiatives focus exclusively solely on Africa, Asia, or Latin America.
- Digital innovation, including artificial intelligence, big data, digital public infrastructure (DPI), blockchain and remote sensing, can unlock new forms of data cooperation and efficiency.

What lies ahead?

- The time for promises is now over and delivery will be the only currency of trust at COP30.
- That delivery must rest on three mutuals:
 - **Mutual clarity** (about responsibilities and pathways),
 - **Mutual cooperation** (that recognises both vulnerabilities and opportunities)
 - **Mutual implementation** (turning promises into practice, across borders and sectors).
- South Asia is leading, innovating and demanding that multilateralism be restored to credibility through delivery.

8.4 India -Bhutan relations

PM Modi undertook a two-day state visit to Bhutan last week, which **coincided** with the celebrations for the 70th birth anniversary of the Fourth King of Bhutan and the ongoing Global Peace Prayer Festival.

What are the pillars of India – Bhutan relations?

- India and Bhutan share unique and exemplary bilateral relations, which are based on mutual trust, goodwill and understanding.

Diplomatic relations –

- Formal diplomatic relations between India and Bhutan were established in 1968.
- The basic framework of the relations has been the **Treaty of Friendship and Cooperation** signed in 1949 between the two countries, which was revised in February 2007.
- **Regular high-level exchanges** – Bhutan's King visited India multiple times in 2022–2024; PM Modi visited Bhutan in 2019 and 2025.
- India follows a **Neighbourhood First Policy**, with Bhutan as a key partner in regional peace and development.



Trade & Economic relations

- **Indian FDI in Bhutan** – India is the largest investor, contributing approximately 50% of Bhutan's total FDI.
- **Bilateral trade volume** – Tripled over the past decade, reaching USD 1.6 billion in 2022–23, with further growth projected in 2025.
- **Major imports** (from Bhutan) – Hydropower, ferrosilicon, cement, and agricultural products.
- **Major exports** – Fuel, machinery, food items, and construction materials.

Development Partnership

- India contributes Rs. 4,500 crore to Bhutan's 12th Five Year Plan, covering 73% of external grants and also, committed Rs. 10,000 crore for 13th Five Year Plan (FYP).

- **Key focus areas** of India's assistance - includes rural water supply, farm roads, infrastructure, health, education, agriculture, and digital connectivity.

Hydropower Diplomacy

- **4 operational projects** – Chukha (336 MW), Kurichhu (60 MW), Mangdechhu (720MW) and Tala (1,020 MW) projects.
- **Trade in Electricity** – India's electricity imports from Bhutan (2022) worth Rs. 2,448 crore

Education & Capacity Building

- **Scholarships** – India provides over 1000 scholarships annually; 4000 Bhutanese students study in India.
- **Skill Development & Training** – Indian Technical and Economic Cooperation (ITEC) Program provides approximately 300 slots/year for Bhutanese officials and private sector employees.

Digital Cooperation

- **BHIM App** – Bhutan became the 2nd country globally to launch BHIM, enhancing cross-border UPI-based transactions.
- India's support for **Digital Drukyl** - provided financial support for optical fibre backbone across all 20 districts to transform Bhutan into a digitally empowered society.

Space Cooperation

- MoU on Peaceful Uses of Outer Space - Signed in November 2020.
- **India-Bhutan SAT** – Jointly developed by ISRO and Bhutan's Department of IT & Telecom (DITT), launched on 26 November 2022 via PSLV.

Cultural & People-to-People Ties

- **India-Bhutan Foundation** - established in 2003 to promote exchanges in education, arts, culture, and environment.
- India supports monastic visits, Buddhist heritage preservation, and temple construction (e.g., Rajgir Lhakhang).
- **Bhutanese pilgrims** regularly visit Bodh Gaya, Rajgir, Nalanda, Sikkim, Udayagiri, and other sacred Buddhist sites in India.
- **Diaspora** – About 50,000 Indian citizens are working in Bhutan, mainly in the construction sector, education and technical consultants involved in infrastructure projects.

Health & COVID-19 Support

- **Vaccine Maitri Initiative** – India gifted 5.5 lakh doses of Covishield to Bhutan and marked a milestone in South-South cooperation and vaccine diplomacy.
- **Repatriation Support** – Facilitated the return of over 2,000 Bhutanese nationals stranded across India.

Defence cooperation - Centered on training the Royal Bhutan Army, joint border management, and strategic coordination, which includes providing equipment, logistical support, and conducting joint exercises

- **Counter-insurgency operations** - India has supported Bhutan in operations against insurgents, such as "Operation All Clear" in 2003, which cleared militant camps from Bhutanese territory.
- **Strategic coordination** - Both countries coordinate on strategic matters, particularly in response to incidents like the 2017 Doklam standoff, which highlighted their commitment to each other's security.

This partnership is crucial for regional stability, with India supporting Bhutan's security and territorial integrity, particularly given Bhutan's strategic location as a buffer state between India and China.

What are the Key Highlights of India's State Visit to Bhutan?

- **Economic & Developmental Assistance** – India reaffirmed its support for Bhutan's 13th Five Year Plan and signed 3 New MoUs - Renewable energy, health, and mental health.
- **Cultural ties** – India has announced land for the construction of a Buddhist temple in Varanasi (in addition to the previous Bhutanese temple in Nalanda).
- **Hydropower Diplomacy** – Inaugurated the 1020 MW Punatsangchhu-II Project and resumed work on the 1200 MW Punatsangchhu-I Project.

- **Line of credit** – India also extended a 1st ever Line of Credit of Rs 40 billion for new energy projects in Bhutan.
- **Connectivity & Infrastructure** – Initiatives like the Darranga Check Post (inaugurated in 2024) and agreed to open an immigration check post at Gelephu, Bhutan and at Hatisar, Assam.
- Bhutan will also enjoy access to Assam's Jogighopa multi-modal logistics park.
- India will be funding 2 railway links - between Samtse and Banarhat (Assam) and Gelephu and Kokrajhar (Assam).

What lies ahead?

- India-Bhutan relations are set to evolve into a multidimensional strategic partnership, moving beyond traditional hydropower and development.
- It aid towards deeper collaboration in digital infrastructure, space technology, education, and private sector investment - reinforced through consistent engagement and shared values.

8.5 India-Africa Relations

In 2015, New Delhi hosted the India-Africa Forum Summit (IAFS-III), which was a moment of significance, now India must "connect, build and revive" its partnership with Africa by strengthening finance, digital cooperation, and institutional mechanisms.

What is the historical progress of India–Africa ties?

- **Civilizational links** – India-Africa relations date back millennia, with trade between the *Indus Valley Civilization and African civilizations*.
- During colonial times, Indian indentured laborers (girmityas) in Africa strengthened socio-cultural connections.
- **Political relations** – It was started when *M.K.Gandhi* started his political career during colonization in South Africa.
- Further shaped through common experiences of colonialism, solidarity in the **Non-Aligned movement** and in forms of developmental diplomacy.
- India supported African liberation movements, especially in Namibia and South Africa, promoting South-South cooperation.
- **Diplomatic Expansion** – Now, India has established 17 new missions across Africa, strengthening its diplomatic footprint.

What are the key areas of cooperation between India and Africa?

- **Economic Relations** – India-Africa trade touched \$98 billion in FY22–23 which is a positive economic development.
 - Bilateral trade crossed \$100 billion, making India one of Africa's top five trading partners.
 - India is among **Africa's top five investors**, with \$75 billion in cumulative investments.
 - India is Africa's **3rd largest export destination**.
 - Exports to Africa - Refined petroleum, pharmaceuticals, automobiles, machinery, textiles.
 - Imports from Africa - Crude oil, gold, coal, pulses, cashew, and other raw materials.
- **Financial collaboration** – India's Exim Bank recently extended a \$40 million **commercial credit line** to the Economic Community of West African States (ECOWAS) Bank for Investment and Development (EBID).
- **Maritime cooperation** – In April 2025, 1st Africa-India Key Maritime Engagement (AIKEYME) was held, between India and 9 African navies.
- India-Africa Defence Dialogue was held in the sidelines of DefExpo 2022 in Gandhinagar, Gujarat.
- Military exercises includes - AFINDEX 2023, anti-piracy patrols, maritime vision via SAGAR and MAHASAGAR initiatives.
- **Cultural relations - Project 'Mausam'** is an initiative of Ministry of Culture, to explore the multi-faceted Indian Ocean 'world' and promote research related to maritime routes.
 - About 39 Indian Ocean countries selected for this project which contains African countries like Egypt, Kenya, Sudan, Somalia etc.,

- **Education & Health** – Africa is one of the beneficiaries of India’s flagship capacity building program – Indian Technical and Economic Cooperation (ITEC).
 - As per National Education Policy 2020 guidelines, **1st IIT (Madras) Campus at Zanzibar, Tanzania.**
 - India supplied '**Made in India' COVID vaccines** to 42 African countries under “One Earth One Health Mission”.
- **Technology** – Pan-African e-Network and e-VBAB projects offer tele-education and telemedicine services.
 - Promoting India Stack (UPI, Aadhaar, DigiLocker) in Africa to support financial inclusion and e-governance.
 - Some cities like Kigali (Rwanda), Nairobi (Kenya) and Lagos (Nigeria), African innovation ecosystems are growing, but the competition is global.
- **Institutional Frameworks** – Africa is shaping its own terms through the **African Continental Free Trade Area (AfCFTA)**, aiming for a unified continental market.
 - **IAFS** the key platform for economic diplomacy; last held in 2015, in New Delhi - welcomed representatives from all 54 African states.

IAFS is the official platform for the African Indian relations which is held once in every 3 years since 2008, that enhances relations and cooperation between India and African nations.

- **Energy Cooperation** – African nations partner with India under the **International Solar Alliance**, while collaborations in green hydrogen, EV ecosystems and blue economy corridors gain traction.
 - Indian firms like ONGC Videsh and Oil India invest in Mozambique, Nigeria, Sudan.
- **Push for global representation** – Beyond that, India continues to push for African representation in global institutions and contributes to United Nations peacekeeping missions on the continent.
 - Example: India’s push for membership for African Union in the **G-20**.

What are the opportunities in India – Africa relations?

- **Demography** – By 2050, one in four people on earth will be in Africa (Africa will host 25% of the global population); India will be the world’s 3rd largest economy.
- This creates a potential growth corridor of commerce, demography, and technology.
- **Evolving engagement model** – Shift from aid to co-development (Build together) - ports, power lines, vaccines, digital tools.
- **Human Capital** – India’s most enduring export to Africa is not technology, it is human resource.
 - Nearly, 40,000 African students trained in India in the past decade, now lead in policy, innovation, and governance across Africa.
- **Growing consumer base** – Africa’s rapidly urbanizing population presents a large market for major Indian sectors like IT, banking, financial services, and mobile payment solutions.

What are the challenges in India – Africa relations?

- **China’s dominance** – India’s trade with Africa is growing, but it still lags behind China.
- **Slow execution of projects** – Indian firms face bureaucratic hurdles, limited capital, logistics issue, political unrest, etc.
- **Loss of institutional momentum** – No IAFS meeting since 2015 has diluted institutional continuity.
- **Focus Diversion** – India’s strategic focus on the Indo-Pacific and strengthening ties with Western powers sometimes diverts attention from Africa.
- **Geopolitical challenges** – Political instability and maritime insecurity in the Indian Ocean Region (IOR) hinder investment and long-term project viability.

What are the moves India must undertake to sustain its thrust in Africa?

- **Connect finance to outcomes** – Ensure every line of credit must lead to delivers visible impact; public finance must de-risk, rather than displacing private capital.

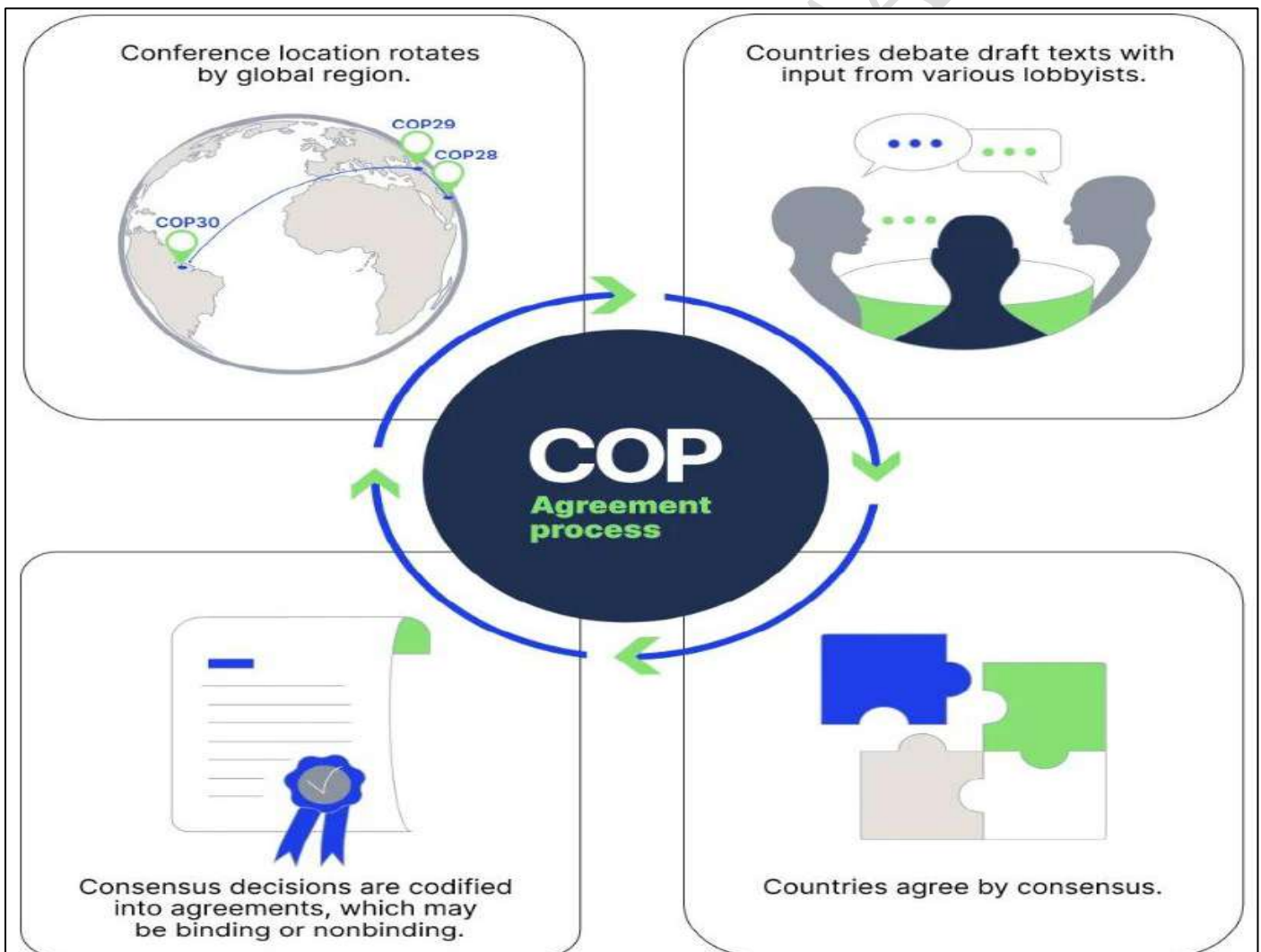
- **Build a digital corridor** – This collaboration should leverage not just UPI and India Stack, but also Africa’s own digital capabilities, so that we can co-develop platforms for health, education, and payments that serve the Global South.
- **Move up the value chain** – Both must co-investing in future-facing sectors – green hydrogen, electric mobility and digital infrastructure.
- **Revive institutional dialogue** – Reconvene IAFS to renew diplomatic momentum.

8.6 UNFCCC-COP30 – Major Outcomes

Recently, the 30th edition of the Conference of the Parties to the UN Framework Convention on Climate Change (COP30), the annual two-week climate talks, concluded in Belem, Brazil on 22nd November.

What is UNFCCC – COP?

- **UNFCCC COP** – It stands for the Conference of the Parties to the United Nations Framework Convention on Climate Change.
- **Purpose** – It is the supreme decision-making body where member countries (Parties) meet annually to assess global efforts to combat climate change and negotiate agreements to limit global warming.
- **Functions** – The COP serves as a forum to review implementation, set new goals, and make decisions on issues like reducing emissions, adapting to climate impacts, and providing climate finance.
- **COP Agreement process**



What are the major outcomes of the COP30?

- **Belem Health Action Plan** – It is a flagship outcome of Brazil’s COP 30 Presidency, which was unveiled on the dedicated Health Day of COP30 – 13 November 2025.
- It is aimed at **strengthening global health systems to cope better with the impacts of climate change**.

- It is structured around two cross-cutting principles and concepts: health equity and ‘climate justice’ and leadership and governance on climate and health with social participation.
- **Tropical Forests Forever Facility (TFFF)** – Brazil, formally launched the TFFF, which is designed as a “*payment-for-performance*” model.
- It uses agreed satellite monitoring standards and systems to reward **tropical forest countries** with a continuing source of funding as long as they preserve their forests.
- TFFF aims to mobilise around USD 125 billion through public and private investment, using returns to pay nations that conserve forests. Brazil made the first \$1 billion investment in the facility.
- **Belem Political Agreement** – The new draft text on a political package, presented on the last day of the event, skirted each of the four long-standing issues it was meant to resolve, leaving almost everyone unhappy.
- A group of 29 countries, mainly small island states and those from Europe, rejected the draft text because it skipped any mention of a roadmap on fossil fuel phase-out, which was one of their key demands.
- The 4 key demands were:
 - **Climate-finance obligation:** Demand of the developing countries regarding full implementation of the finance provision contained in Article 9.1 of the Paris Agreement.
 - **Climate-related trade measures:** India, China, and some other developing countries have been flagging concerns related to trade-related restrictive measures, such as the European Union’s Carbon Border Adjustment Mechanism (CBAM). They have argued that CBAM is a discriminatory trade practice disguised as climate action.
 - **Collective Response to the 1.5°C Goal/Fossil Fuels:** Developed nations want to see enhanced mitigation actions in pursuit of the 1.5 degrees Celsius global warming target.
 - **Transparency Reporting Framework:** Demand mainly raised by developed countries to have greater transparency in reporting on climate actions
- **Santa Marta conference** – In a move to push for a global phaseout of fossil fuels, Colombia announced an international conference on Just Transition Away from Fossil Fuels, to be co-hosted with the Netherlands, in Santa Marta on April 28-29, 2026.
- The objective of the conference is to explore the legal, economic and social dimensions of phasing out fossil fuels – from trade impacts and subsidy reform to macroeconomic stability, energy security, renewable deployment, and labour transitions.
- **The Open Planetary Intelligence Network (OPIN)** – This is launched for data interoperability, which will accelerate the global climate transformation by unifying critical digital technologies.
- **The Global Ethical Stocktake (GES)** – This is yet another significant initiative, which seeks to incorporate moral and ethical considerations and civil society dimensions into the global climate action agenda. Its Asia edition was held in New Delhi this September
- **Belem 4x pledge** – Belém 4X pledge on sustainable fuel is a “call to action” to accelerate the energy transition and expand the supply of liquid biofuels, biogas, hydrogen, and other inputs.
- It aims to provide political support and promote international cooperation to increase at least fourfold the use of sustainable fuels by 2035, from 2024 levels.
- **Belem Declaration on Hunger, Poverty, and People-Centered Climate Action** – At the climate summit, leaders from 43 countries and the European Union signed this declaration, placing the world’s most vulnerable populations at the center of global climate policy.
- The declaration recommends that “countries continue investing in mitigation, while giving greater priority to adaptation—particularly human-centered measures such as social protection, crop insurance, and other instruments that strengthen community resilience.
- **National Adaptation Plan (NAP) Implementation Alliance** – It is a multistakeholder partnership aimed at accelerating the effective and impactful implementation of National Adaptation Plans (NAP), which was announced at the summit.
- The Alliance is a part of the Plan to Accelerate Solutions (PAS) within the COP30 Action Agenda which aims to accelerate collaboration between the organizations supporting the implementation of NAPs and mobilize public and private investment to advance national adaptation priorities.

- **Brazil pushes for Mutirao strategy** – The Brazilian Presidency of COP30 today unveiled the official Global *Mutirão* platform within the COP30 website, a new digital entry point to unite and amplify climate action around the world.
- The proposal aims to close the gap between pledges and delivery and serves as Brazil’s high-stakes blueprint for COP30, centred on accelerating progress in energy, finance, and trade.

***Mutirao** is a Brazilian tradition of collective, community-driven mobilisation – a spirit the Presidency seeks to translate into global climate action.*

What are some major outcomes from the previous COPs?

History of COP: Milestones in Global Climate Negotiations			
<p>1995 Berlin, Germany COP1: Berlin Mandate First COP established analysis phase to negotiate actions for combating climate change <i>First steps but not enough</i></p>	<p>1997 Kyoto, Japan COP3: Kyoto Protocol First treaty committing industrialized countries to reduce GHG emissions by 5% below 1990 levels by 2012 <i>World's first emissions reduction treaty</i></p>	<p>2005 Montreal, Canada COP11: Protocol Implementation First meeting of Kyoto Protocol parties; approved carbon markets and clean development mechanism <i>Montreal Declaration reaffirmed commitment</i></p>	<p>2009 Copenhagen, Denmark COP15: Copenhagen Accord Non-binding agreement to limit temperature rise to 2°C; created \$100 billion climate fund for developing nations <i>Chaotic negotiations, incomplete outcome</i></p>
<p>2015 Paris, France COP21: Paris Agreement 195 countries adopted binding treaty to limit temperature rise well below 2°C, aiming for 1.5°C <i>First great achievement, global climate pact</i></p>	<p>2023 Dubai, UAE COP28: Fossil Fuel Transition Countries acknowledged fossil fuels as primary cause of climate change; agreed to triple renewable energy by 2030 <i>Inclusion of Indigenous Peoples emphasized</i></p>	<p>2024 Baku, Azerbaijan COP29: Finance Deal Developed countries to deliver \$300 billion per year by 2035 to developing nations for emissions reduction <i>Base for future climate finance</i></p>	<p>2025 Belem, Brazil COP30: Amazon Gateway Conference at gateway to Amazon; 198 parties now committed to annual climate negotiations <i>Ongoing negotiations on key issues</i></p>

8.7 Strengthening India's Presence in Asia – The New Direction

Recently, the U.S. Secretary of State told the Senate that the story of the 21st century will be written in Asia.

Why India should strengthen its position in Asia?

- **U.S actions** – The U.S. is overturning multilateralism and reducing India's strategic policy space in several key domains as India's relations with China improve and those with Russia strengthen.
- **Improving relation with China** – With China, it should be a case of 'trust but verify' as negotiations for an international border in Ladakh advance.
- India is having the potential to settle the Kashmir issue and investment that may follow.
- **Strengthening ties with Russia** – Russia is a 75-year-old tested partner and its S-400 was the game-changer in 'Operation Sindoor'.
- **India's choice** – For India, the choice is not binary, as western analysts argue, tilting towards the U.S. or China.
- The new direction for India should be toward Asia, whose market will be larger than the U.S.
- **Asia's potential** – Asia coming together in a form very different to the way the West came together, not based on colonialism or global rules but shared value chain interests.
- Countries in the region want partnership with India, as it has the technological capacity and economic heft to balance China.
- Asia, with two-thirds of the global population and wealth, is again at the centre of the world.
- **Knotting the region** – BRICS, with overlapping membership and policies, the SCO, with its stress on geo-security-economics, and the Association of Southeast Asian Nations, a political-trade grouping, are going to be intertwined.
- The door to re-entry into the Regional Comprehensive Economic Partnership is still open.
- This is where trade concessions should be made, which will be outside World Trade Organization rules, including modus vivendi on trade with China, as an alternative market to the U.S.

What are the hard decisions that has to be made by India?

- **Operationalisation of 'strategic autonomy'** – It should be based on India's uniqueness having two global agendas.
- It has the highest growth rate, huge potential till 2100, the largest labour pool & the highest number of the poor.
- Within the United Nations, India's foundational sustainable development interests are closer to the Global South.
- India will need to clarify its understanding of 'partnership' linking value chains and adjusting priorities without diluting them to avoid accepting the agendas and frameworks of others.
- **Framing new rules** – Asia had no answer to Europe's gunboats and later leverage, and interdependence gave immense advantage to the West.
- Interconnectedness of the digital economy is reflected in technological capacity, not diplomacy, leading to military capability.
- Assumptions of foreign, technology and security policies are being questioned as innovation interconnections determine economic growth, political influence and military strength.
- For India, there can be no compromise on national data, endogenous technology innovation, local defence production and inclusive growth.
- **Cyber warfare** – It should be the central pillar of national security, based on India's comparative advantage, and not theatre commands as land-based threats have changed.
- **Countering pakistan's move** – China has stepped back from the China-Pakistan Economic Corridor which Pakistan has substituted with expensive Asian Development Bank loans.
- Pakistan has strategic support from the U.S, a mutual defence pact with Saudi Arabia and increased influence, along with the U.S., in Bangladesh.
- The U.S. is seeking the Bagram base in Afghanistan.

- India has also secured a six-month waiver from U.S. sanctions on Chabahar Port which gave India an opening into Iran, Afghanistan, Central Asia and Russia.
- **Reorienting the defence allocations** – The evolving neighbourhood landscape suggests the need for a national debate on reorienting defence allocations.
- By halving the size of the Army and reducing numbers of large (imported) platforms for endogenous Artificial Intelligence (AI), air defence, space, missiles and drones where India has world-class capability – to factor in the need for continuing innovation, with spin-offs for growth.
- **An AI future** – Shaping the global AI future is necessary for double-digit inclusive growth.
- A Parliamentary Standing Committee has emphasised the need for indigenous research in foundational AI models to ensure sovereign capability.
- Funding should increase at least 20-fold to support national strategic collaboration, high-end computational resources, proprietary models and talent development driven by the Prime Minister's Office.
- AI sovereignty is now the key requirement to be a global power by 2047.

9. ECONOMY

9.1 Digital Gold - The Concept and Risks

Recently, the Securities and Exchange Board of India (SEBI) has issued a strong caution to the general public about investing in digital gold and e-gold products.

What is Digital Gold?

- **Definition** – Digital gold refers to the process of buying and holding gold electronically without physically possessing the metal.
- The value of digital gold is directly linked to the price of physical gold, which means investors benefit from price appreciation similar to traditional gold holdings.
- **Creation** – These products are usually created using blockchain technology, which enables seamless buying, selling, and storage in a digital format.
- **Advantages** – One of the major attractions of digital gold is its accessibility.
 - Investors can start with very small amounts, unlike physical gold purchases that typically require a larger financial outlay.
 - Digital gold also offers quick liquidity, allowing investors to sell their holdings instantly in times of need.
 - Another advantage is the elimination of storage issues, which remain a major concern for physical gold owners.
 - Digital gold can also be converted into physical gold in the form of coins, bars, or jewellery if required.
- **Reasons for popularity** – The sharp increase in gold prices has further contributed to the popularity of digital gold.
 - **For instance**, MCX spot gold prices have risen by nearly 59% over the last year, increasing from Rupees.76,577 per 10 grams to Rupees.1.22 lakh per 10 grams.
- This substantial rise has attracted new investors, many of whom are turning to digital platforms for convenience and flexibility.
- However, SEBI has clarified that digital gold remains outside the regulatory framework, exposing investors to serious risks.
- This article explains what digital gold is, why SEBI has raised concerns, the risks involved, and what safer alternatives investors should consider.

Why Has SEBI Cautioned Investors About Digital Gold?

- **Raising online promotions** – SEBI has observed that numerous digital and online platforms are actively promoting digital gold as a convenient alternative to physical gold.
- **Different from gold securities** – SEBI has emphasised that these digital gold products are fundamentally different from gold-related securities regulated by the authority.

- Digital gold is *not classified as a security*, nor is it regulated as a commodity derivative.
- **Absence of regulation and control** – Since digital gold is offered outside SEBI's jurisdiction, the regulator has no control over the manner in which these products are issued, traded, or stored.
- SEBI has clarified that these digital gold offerings fall entirely outside the securities market framework, which means that the usual investor protection mechanisms do not apply to them.
- The rapid rise in digital gold trading, particularly through mobile apps, fintech platforms, and jewellers, has prompted SEBI to alert investors about the potential dangers associated with unregulated investment products.

Why are digital gold products considered risky?

- **Absence of regulatory oversight** – According to SEBI, digital gold products operate entirely outside any established regulatory framework, which makes them inherently risky.
- **Counterparty risks** – Investors are exposed to counterparty risks because the platforms offering these products may not always have proper systems in place to guarantee the gold being sold.
 - Counterparty risk refers to the possibility that the entity selling or storing the gold may default on its obligations.
- If the platform faces operational issues, financial distress, or fraud, investors may lose their money.
- **No risk managements system** – Unlike regulated gold ETFs or commodity derivatives, digital gold transactions are not backed by clearing corporations or risk management systems.
- **Operational risks** – Some platforms might fail to store the gold securely or maintain adequate physical reserves.
- Experts say that digital gold behaves like an over-the-counter (OTC) exchange-traded product, where the biggest concern is the potential for default.
- Since there is no statutory body monitoring the issuance and storage of digital gold, investors are vulnerable if the provider fails to honour their claims.
- **Growing influence** – Social media promotes digital gold as a quick and easy investment option.
- Many investors, especially young users, are drawn to advertisements and promotions without fully understanding the underlying risks.

What are the SEBI – regulated alternatives to digital gold?

- **Gold Exchange-Traded Funds (Gold ETFs)** – Gold ETFs are mutual fund schemes that invest in physical gold of high purity.
 - They can be bought and sold on stock exchanges and require a demat account.
 - These products are regulated, backed by physical reserves, and offer transparent pricing.
- **Sovereign Gold Bonds (SGBs)** – SGBs are government-backed securities issued by the Reserve Bank of India.
 - They not only track gold prices but also offer an additional interest rate of 2.5% per year.
 - They are one of the safest and most tax-efficient ways to invest in gold.
- **Electronic Gold Receipts (EGRs)** – EGRs are tradeable instruments on stock exchanges representing gold stored in accredited vaults.
 - They are fully regulated, provide transparency, and ensure safe storage through certified agencies.
- **Commodity Derivatives on MCX and NSE** – Commodity derivatives allow investors to trade gold contracts under strict regulations, daily settlement systems, margin frameworks, and guaranteed clearing processes.
 - These features eliminate counterparty risk and ensure market integrity.

What lies ahead?

- Digital gold may appear to be a simple and modern way to invest in the precious metal, but SEBI's warning highlights the significant dangers associated with unregulated financial products.
- Without regulatory supervision, investors remain exposed to counterparty, operational, and security risks.
- To ensure safety and long-term financial stability, investors should choose regulated gold investment instruments such as Gold ETFs, Sovereign Gold Bonds, and EGRs.

- These options provide better protection, transparency, and reliability, making them far more suitable for informed investors.

9.2 Issues with India's Foodgrain Procurement System

The recent kuruwai season procurement crisis in Tamil Nadu underscores the pressing need to reform procurement mechanisms, incentivize crop diversification, and rationalize food security policies for long-term sustainability.

How does India's foodgrain procurement system function?

- **India's foodgrain procurement system** – It is a **centralized system** managed by the **Food Corporation of India (FCI)** and state government agencies to ensure food security.
- **Purpose** – To ensure food security, stabilize food prices, and provide a safety net for farmers by guaranteeing a minimum price for their produce.
- **Oversees by** – Ministry of Consumer Affairs, Food and Public Distribution.
- **Procurement** – Grains are purchased from farmers at a **Minimum Support Price (MSP)** and stored to the Central Pool for distribution under National Food Security Act (NFSA) and other welfare schemes.
 - This process is supported by both Centralized and Decentralized Procurement Systems (DCP).
- **Storage and distribution** – The FCI manages the storage, transportation, and bulk allocation of foodgrains to states.
- States are then responsible for distributing the grains to beneficiaries through the Public Distribution System (PDS) network of fair price shops.
- **Quality standards** – Procurement is based on "**Fair Average Quality (FAQ)**" specifications.

What are the challenges that identified in India's foodgrain system?

- **Overproduction of rice** – India consistently produces more rice than required.
 - As of October 2025, rice stocks stood at 356.1 lakh tonnes, over three times the buffer norm of 102.5 lakh tonnes (as per the Union Ministry of Consumer Affairs).
- **Procurement-Utilization mismatch** – Annual rice procurement (525–547 lakh tonnes) far exceeds PDS offtake (392–427 lakh tonnes), leading to stockpiling and wastage.
- **Wheat vs Rice**
 - **Balanced wheat**– Wheat procurement is more balanced, with PDS offtake sometimes exceeding procurement in two of the last three years (except 2024–25).
 - **Surplus rice** – Rice remains significantly overstocked compared to wheat, as evidenced from the past procurement and offtake under the NFSA and allied schemes.
- **High food subsidy** – The Union government spends **Rs. 2 lakh crore annually on food subsidies**, largely due to excessive procurement and storage.
- **Import dependence despite domestic potential** – While India struggles with excessive rice stocks, it simultaneously bears a heavy financial burden from importing pulses and oilseeds.
 - **Pulses** – India is the **world's largest producer of pulses** (252.4 lakh tonnes in 2024–25), yet imported Rs. 30,000 crore worth in 2023–24.
 - **Edible oils** – Imports worth Rs. 1.2 lakh crore in 2023–24, covering 55% of demand, despite stagnant domestic oilseed production, approximately 25 million hectares under cultivation.
- **MSP-driven paddy monoculture cultivation** – Farmers prefer paddy due to assured returns, discouraging diversification.
- **PDS leakages** – An *Indian Council for Research on International Economic Relations (ICRIER)* report estimated **28% leakage in rice and wheat distribution**, raising concerns about systemic inefficiencies.
- **Legacy of liberalized imports** – 1990s policy to allow cheap edible oil imports is blamed for stunting domestic oilseed production.
- **Institutional inefficiencies** – The centralized procurement and distribution lack agility and transparency.
 - **For example**, Tamil Nadu Civil Supplies Corporation (TNCSC) faced procurement delays and corruption allegations.

What need to be done to enhance India's foodgrain system?

- **Reassess procurement policy** – Re-evaluate the sustainability of rice-centric procurement under the guise of food security and consider decentralizing procurement and involving more stakeholders.
- **Promote crop diversification** – Conduct area-specific market studies and provide financial incentives and extension support to reduce farmer risk in switching crops.
- **Rethink export restrictions** – The Due to surplus in rice production, the government should permit farmers to export rice without abrupt restrictions, ensuring stable market access and farmer confidence.
- **Strengthen farmer institutions** – Empower Farmer Producer Organisations (FPOs) to handle procurement, marketing, and supply chains and facilitate direct tie-ups between producers and processors.
- **Build institutional capacity** – Invest in capacity building for FPOs, self-help groups, and cooperatives and use these institutions to promote soil health awareness, market intelligence, and diversification strategies.
- **AI-enabled coordination** – Use of technology and AI systems to improve coordination among stakeholders in food procurement and distribution.

What lies ahead?

- Changes in such a complex system cannot happen overnight but a beginning can be made.
- It is time that agriculture experts, farmers, food security specialists, policy makers and planners collectively deliberated on ways to plug the loopholes in the system, if not reform it.

AGRICULTURE

9.3 Agricultural Education & Training in India

The government of India has introduced several schemes and programmes for developing the agricultural education in India.

What is Indian Council of Agricultural Research (ICAR)?

- **Apex body for agri research and education** – Indian Council of Agricultural Research (ICAR), established in 1929 (under the Department of Agricultural Research and Education, Ministry of Agriculture and Farmers Welfare), is India's premier organization for coordinating agricultural research and higher education.
- It is responsible for guiding research institutes and universities in agriculture, horticulture, fisheries, and animal sciences.
- **Nationwide network** – ICAR oversees a vast system, 113 national research institutes and 74 agricultural universities across India, making it one of the world's largest agri research networks.
- It spearheaded the Green Revolution and continues to lead in developing climate-resilient, high-yield varieties and farming technologies.
- **Extension and quality** – Through its divisions, ICAR manages 731 Krishi Vigyan Kendras (KVKs) to transfer technologies to farmers.
- It also sets academic standards, issuing the 'ICAR Model Act (Revised 2023)' and 'Minimum Requirements for Establishing the Agricultural Colleges', and accredits institutions via the National Agricultural Education Accreditation Board.

What are the important Public and Private Institutions?

- **Government universities and institutes** – India has
 - 63 State Agricultural Universities (SAUs),
 - 3 Central Agricultural Universities (CAUs) (Pusa, Imphal, Jhansi).
 - 4 "Deemed" universities (IARI-Delhi, NDRI-Karnal, IVRI-Izatnagar, CIFE-Mumbai).
 - 4 Central Universities with agriculture faculty.
 - The ICAR network also includes 11 ATARI (Agricultural Technology Application Research Institutes) centres.
- **Private sector** – Agricultural education falls under the purview of State Governments, which have their own policies for establishing and promoting private institutions.

- ICAR's role is limited to granting accreditation upon request.
- Over the past five years, the number of ICAR-accredited private agricultural colleges has risen from 5 in 2020–21 to 22 by 2024–25.
- **Central Agricultural Universities** – Currently, three Central Agricultural Universities (CAUs) operate in India.
- Each was created by an Act of Parliament to serve regional needs:
- **Dr. Rajendra Prasad CAU, Pusa (Bihar)** – Converted to a CAU in October 2016 from the former Rajendra Agricultural University (Estd. 1970).
- It has 8 constituent colleges:
 - Tirhut College of Agriculture
 - Post Graduate College of Agriculture
 - College of Agricultural Engineering and Technology
 - College of Community Science
 - College of Basic Sciences and Humanities
 - College of Fisheries
 - Pt. Deen Dayal Upadhyay College of Horticulture and Forestry
 - School of AgriBusiness & Rural Management
- **Central Agricultural University, Imphal (Manipur)** – Established in January 1993 under the Central Agricultural University Act, 1992.
- The university serves seven Northeastern hill states, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, Nagaland, and Tripura.
- **Rani Lakshmi Bai CAU, Jhansi (Uttar Pradesh)** – Established as an Institution of national importance under *the Department of Agricultural Research and Education (DARE)* by an Act of Parliament.
- The university serves as a centre of excellence in agricultural sciences, dedicated to advancing education, research and extension services in India.

What are the applications of Internet of Things (IoT) and Artificial intelligence (AI) in Agriculture?

- **Technology Adoption** – The government is actively promoting the Internet of Things (IoT) and Artificial Intelligence (AI) to modernize farming.
- Applications include precision farming (sensor-driven irrigation, automated machinery), drones for imaging and spraying, livestock monitoring, climate-smart greenhouses, AI-driven pest/crop monitoring, and remote sensing.
- **Innovation Hubs** – Under DST's National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), 25 Technology Innovation Hubs (TIHs) were set up nationwide focused in the application of IoT and AI in agriculture.
 - **For example**, IIT Ropar's Agri/Water TIH, working on IoT sensors for saffron production and supply all over India.
- **Digital Infrastructure** – The Ministry of Electronics has established Centres of Excellence on IoT in cities like Bengaluru, Gurugram, Gandhinagar and Visakhapatnam.
 - **For instance**, it focuses on agri-tech and connects startups, industry, investors, and academia to democratize innovation.
- **Start-up Ecosystem** – The *"Innovation and Agri-Entrepreneurship Development"* programme under the Rashtriya Krishi Vikas Yojana (RKVY) has been fostering innovation and agripreneurship by offering financial assistance and strengthening the agri-incubation ecosystem.
- The initiative supports start-ups in agriculture and allied sectors, with the dual aim of boosting farmers' incomes through new opportunities and generating employment for rural youth.

What are the schemes for skilling and training of farmers?

- **Krishi Vigyan Kendras (KVKs)** – These ICAR-run centers are the frontline for farmers training.

- KVK courses cover improved agronomy, livestock care, soil health, post-harvest tech, etc., tailored to local conditions.
- **ATMA (Extension Reform Scheme)** – The Agriculture Technology Management Agency (ATMA) scheme plays a key role in strengthening decentralized agricultural extension.
- **Skill Training of Rural Youth (STRY)** – STRY provides short vocational courses (about seven days) in agri/allied trades (horticulture, dairy, fisheries, etc.).
- The program aims to boost self-employment and create skilled manpower in villages.
- **Farm Mechanization (SMAM)** – The Sub-Mission on Agricultural Mechanization (SMAM) provides training on farm machinery use.
- **Soil Health Card Scheme** – This program issues soil health cards and educates farmers on balanced fertilization.
- **Farmer Producer Organizations (FPOs)** – To build market-oriented capacity, the government has registered over 10,000 FPOs.
- Through digital modules and webinars, farmers in FPOs receive training on agri-business management, value chains and marketing.

What lies ahead?

- India's agricultural education and training system today reflects a well-integrated approach linking education, research, technology, and field-level skill development.
- Guided by the vision of "One Nation – One Agriculture – One Team," institutions such as ICAR, Central and State Agricultural Universities, and Krishi Vigyan Kendras have created a strong foundation to make farming more productive, sustainable, and knowledge-driven.
- The continuous emphasis on quality education, accreditation reforms, and farmer-centric training is helping bridge the gap between scientific research and practical applications.
- As India aims for self-reliance in food production and a resilient rural economy, strengthening this synergy between education, innovation, and skilling will remain central to the nation's agricultural progress.

9.4 Sustainable Animal Health Management in Rural India

Recently, unchecked antibiotic use in rural livestock has accelerated antimicrobial resistance (AMR).

What is the relationship between AMR and rural livestock?

- **Commercialized livestock system** – The rising demand for animal products such as milk, eggs, meat, and other derivatives has led to a more commercialised livestock system.
- **Misuse of antibiotics** – In the process of livestock commercialization, the overuse and misuse of antibiotics have become common, whether for disease prevention or to enhance production.
- **Undermining veterinary consultations** – Antibiotics are frequently administered without veterinary consultation or proper diagnosis, often based merely on visible symptoms.
- Consequently, incomplete courses, overdosing, or the use of inappropriate medicines are common.
- As a result, pathogenic microorganisms develop resistance to these drugs.
- **Effects of resistant microbes** – These resistant microbes pose serious threats not only to animal health but also to human health, while simultaneously contaminating the food chain and the environment.
- Thus, antimicrobial resistance (AMR) has emerged as a One Health issue – linking the health of animals, humans, and the environment.

World Antimicrobial Awareness Week (WAAW) 2025 will take place from November 18 to 24, 2025, which is aimed to increase awareness of global antimicrobial resistance (AMR) and to encourage best practices.

What are the major challenges in rural India?

- **Weak animal health infrastructure** – In rural areas, trained para-veterinarians or *Pashu Sakhis / Pashu Salah Karmis* are few in number.
- Government veterinarians often serve multiple villages and veterinary centres simultaneously.

- Due to the lack of immediate medical support, farmers frequently self-medicate their animals or rely on local drug sellers, especially for small livestock such as goats and poultry.
- **Inadequate awareness** – Farmers generally lack sufficient awareness regarding the proper use of antibiotics – their effects, side effects, correct dosage, and the withdrawal period (the time required before milk or meat can be safely consumed).
- **Market pressure** – Milk cooperatives, private companies (including medicine suppliers), and individual buyers tend to emphasise quantity over quality. This market pressure often pushes farmers – knowingly or unknowingly – to use additional drugs to restore animal health quickly and increase productivity.
- **Lack of surveillance and data** – AMR surveillance in India’s veterinary sector is extremely limited.
- There is no systematic mechanism for regular data collection and analysis from rural areas, making it difficult to assess the scale and pattern of antibiotic resistance in livestock.

What are some positive initiatives and pathways for solutions?

- **Community-Based Animal Health Management** – Organisations such as the Aga Khan Rural Support Programme (India) have expanded access to animal health services at the village level through the *Pashu Sakhi* model.
- These locally trained women assist farmers in vaccination, parasite control, and basic animal care – including housing, feeding, health, marketing, and management.
- This approach reduces unnecessary drug use and strengthens preventive health measures.
- **Awareness and Training** – Regular training sessions should be organised for farmers, livestock advisors, and paravets.
- Awareness can also be promoted through banners and wall paintings highlighting the responsible use of antibiotics, biosecurity, and hygiene practices.
- **Promotion of Preventive Measures** – Preventive initiatives such as vaccination, improved nutrition, selective breeding, clean water, and hygienic animal housing help reduce the risk of infection and, consequently, the dependence on drugs.
- **Strengthening Policy and Regulatory Frameworks** – Strict controls should be enforced on the sale of antimicrobial drugs without prescription, along with monitoring of the veterinary drug supply chain and vaccination cold chain.
- State animal husbandry departments should also prepare local action plans aligned with the National Action Plan on AMR.
- **Data-Based Monitoring** – In collaboration with veterinary colleges, laboratories, and community organisations, a *Rural AMR Surveillance Network* can be developed to track infections and drug usage at the grassroots level.
- Livestock in India is not merely a source of livelihood but also the foundation of nutritional security and social stability, particularly in rural and remote regions.

What lies ahead?

- The path to solutions lies in community participation, policy support, and local innovation.
- Prioritising awareness and responsible animal health management in rural India will not only help control AMR but also pave the way for a healthy and sustainable livestock system.
- If these measures are adopted to control AMR, not only will animal health improve, but farmers’ wellbeing will also benefit, and the overall cost of livestock rearing will decline.
- Healthy animals will yield higher and more consistent production, leading to stable income. Moreover, livestock-related ecosystems will become more sustainable and secure.

9.5 Draft Seeds Bill – Provisions and Concerns

Recently, The Union Agriculture Ministry released the draft Seeds Bill on November 12, and has invited public comments on it till December 11.

What is the background?

- **Domestic requirement and surplus** – According to the Union Agriculture Ministry, in 2023-24, the country had an overall requirement of 462.31 lakh quintals of seeds for various crops.

- The availability being 508.60 lakh quintals, which then led to a surplus of 46.29 lakh quintals of seeds.
- **Demand for technical progress** – The seed industry has been demanding that the 1966 Act should be amended to accommodate technological and scientific advancements in the sphere of seeds and to address the changes in trade and commerce over the last six decades.
- **Response from seed companies** – In their initial response, the Federation of Seed Industry of India said the release of the draft is a timely and much-needed step toward modernising India’s seed regulatory framework.
- **Response from farmers** – The Samyukt Kisan Morcha, an umbrella body of farmers, said they will continue to oppose moves to bring amendments in the Bill that are “anti-farmer”.

What are the new provisions?

- **Regulatory mechanisms** – The Bill provides a regulatory mechanism in the area of import, production and supply of quality seeds.
- **Restriction on farmer’s rights** – The Bill does not restrict the right of the farmer to grow, sow, re-sow, save, use, exchange, share or sell his farm seeds, except when he sells such seed or planting material under a brand name.
- **Definition of stakeholders** – The Bill defines farmer, dealer, distributor and producer as separate entities that deal with the production, distribution, trade and use of seeds.
- **Committees** – It also provides for the establishment of 27-member Central and 15-member State seed committees.
 - The Central seed committee can recommend the minimum limits of germination, genetic and physical purity, traits, seed health and additional standards of seeds to the Union Government.
 - The State Seed Committee can advise the State Government on registration of seed producers, seed processing units, seed dealers, distributors and plant nurseries.
- **Mandatory registration** – Under the Bill, it is mandatory that all seed processing units must be registered with the State governments based on the provisions in the proposed legislation.
- **Accreditation system** – The Bill, however, adds that to promote ease of doing business, the Union government may establish a merit based and transparent Central Accreditation System for companies operating in multiple States.
- **Office of registrar** – The Bill suggests the creation of the office of Registrar to keep a National Register on seed varieties under the Central seed committee.
- The procedure for conducting field trials to assess the Value for Cultivation and Use of any kind or variety is also detailed in the draft Bill.
- **Testing labs** – The Bill also has provisions for the establishment of Central and State seed testing laboratories, where analysis of seed of any kind or variety shall be carried out in the prescribed manner.
- **Seed inspectors** – The Bill also explains the role and powers of seed inspectors, an officer with powers under the provisions of the Bharatiya Nagarik Suraksha Sanhita to search or seize.
- **Offences & Punishments** – The Bill details the punishment for trivial, minor and major offences for flouting provisions under the Bill.
- The punishment ranges from a fine of ₹50,000 to ₹30 lakh and up to three years of imprisonment.

What are the changes from 2019 draft?

- **Offences and punishments** – In the previous draft, the offences were covered under consumer protection laws and the penalty ranged between ₹25,000 and ₹5 lakh and an imprisonment up to one year.
- There are substantial changes with respect to this section in the new draft.
- **Rights of farmers** – On farmers’ rights, the new draft links the matter with the Protection of Plant Varieties and Farmers Rights Act.
- **Quality and imports** – On quality norms, the standards have been tightened.
- The new Bill looks at the import of seeds in a more liberal way.

What are the concerns of farmers?

- **Increased cost of cultivation** – The All India Kisan Sabha, a constituent of the Samyukt Kisan Morcha, said the Bill is poised to increase cost of cultivation by allowing corporates to indulge in the predatory pricing of seeds.

- **Monopoly of MNC's** – They doubt the Bill is part of a larger political project to dispossess small farmers and surrender the country's seed sovereignty to a handful of multinational and domestic monopolies.
- **Centralised system** – The Kisan Sabha pointed out that the draft Seeds Bill introduces a heavily centralised and corporatised regulatory system.
- This risks weakening farmer-centered protection and diluting India's legal architecture for biodiversity conservation and farmers' rights.
- **Ensuring legal protection** – They demanded that the new draft must complement, the progressive legal safeguards already established under the Protection of Plant Varieties and Farmers Right Act of 2001.
- **Complementing to international treaties** – India's international commitments under the Convention on Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture should be ensured.

What lies ahead?

- The Seeds Bill, seen as a regulatory step to ensure quality of seeds sold and distributed to farmers, promotes "ease of doing business" and reduces compliance burden.
- It also aims to maintain strong provisions to penalise serious violations, as per the government.
- The government has been open about its intention to amend the Seeds Act of 1966 and the Seeds (Control) Order of 1983.

9.6 Fisheries and Aquaculture in India – Role and Commitments of FAO

Recently, On World Fisheries Day 2025 (November 21), the Food and Agriculture Organization of the United Nations (FAO) calls for a renewed commitment to India's Blue Revolution and supports the Government of India's theme this year, which is "India's Blue Transformation: Strengthening Value Addition in Seafood Exports".

What is the status of India's fisheries and aquaculture?

- **Rapidly growing** – Fisheries and aquaculture are among India's fastest-growing food-producing sectors, playing a vital role in livelihoods, nutrition, and trade.
- **Technological and institutional support** – Over the decades, India has witnessed remarkable growth in aquatic food production that is driven by technological innovation, institutional support and proactive policy measures.
- **Critical challenges** – Overfishing, habitat degradation, water pollution and climate change are straining aquatic ecosystems.
 - Small-scale fishers and farmers often lack access to finance, technology and markets, while poor traceability.
 - Inadequate post-harvest measures limit tapping of the best export and domestic market potential and compromise food security.
- **World production** – According to the FAO State of World Fisheries and Aquaculture (SOFIA) 2024, global capture fisheries produced 92.3 million tonnes in 2022, while aquaculture reached a record 130.9 million tonnes, valued at \$313 billion.
- **India's contribution** – India contributed 10.23 million tonnes of aquatic animals, making it the world's second-largest aquaculture producer.
- India's aquatic food production, encompassing capture fisheries and aquaculture, has risen from 2.44 million tonnes in the 1980s to 17.54 million tonnes in 2022-23.
- **Rise of aquaculture** – It has emerged as one of the key driver of this growth, reflecting sectoral modernisation through advanced technologies, infrastructure and institutional support.
- **Major institutions** – Agencies such as
 - The Indian Council of Agricultural Research (ICAR) fisheries institutes,
 - Marine Products Export Development Authority,
 - National Fisheries Development Board, have promoted innovation and best practices.
 - The Coastal Aquaculture Authority has regulated coastal aquaculture activities to ensure environmental compliance.

- **Role of private sector** – The private sector has expanded investments from hatcheries to exports, reinforcing value chain efficiency.
- **Programmes and schemes** – The past decade has ushered in a new phase of transformation, beginning with India's Blue Revolution initiative and advancing under the Pradhan Mantri Matsya Sampada Yojana (PMMSY).
- These programmes have driven production growth, particularly in inland and brackish water aquaculture, while improving safety, regulation, and resilience in fisheries.
- **Key reforms** – This include vessel transponders for fisher safety, digital and credit inclusion through the Kisan Credit Card.
- The establishment of Matsya Seva Kendras for integrated support.
- The Climate-Resilient Coastal Fishermen Villages Programme and the draft National Fisheries Policy 2020 are positive developments.

What are the supports of FAO towards aquaculture and fisheries across India?

- **Strong partner** – The FAO has been a long-standing partner in India's fisheries and aquaculture journey, supporting the country's transition toward sustainability and resilience.
- The FAO's decades of collaboration with India have shaped policy, strengthened institutions, and advanced innovation in the sector.
- **BOBP** – The FAO's collaboration with India began with the Bay of Bengal Programme (BOBP), one of FAO's earliest regional small-scale fisheries initiatives.
- The FAO, through BOBP, has supported the Government of India in improving small-scale fishing technologies, strengthening sea safety, and enhancing post-harvest management.
- **BOBLME** – The FAO's Bay of Bengal Large Marine Ecosystem (BOBLME) project strengthened India's efforts to balance fisheries and conservation.
- It supports the Ecosystem Approach to Fisheries Management (EAFM), and National Plans of Action to combat Illegal, Unreported, and Unregulated (IUU) fishing, a major threat to marine ecosystems and sustainable fisheries, conserve endangered species and sustain small-scale fisheries.
- **Support to GEF** – To support India's rapid strides in the field of aquaculture, the FAO is supporting a Global Environment Facility (GEF)-funded project in Andhra Pradesh on 'Transforming Aquaculture to a Sustainable, Reduced Footprint and Climate-Resilient Food System'.
- The programme is guided by Guidelines for Sustainable Aquaculture (GSA) and Ecosystem Approach to Aquaculture (EAA) principles.
- The project aims to support the Department of Fisheries, Government of Andhra Pradesh, in promoting climate-resilient, sustainable aquaculture.
- It benefits the State and serving as a model for India to take forward the government's Blue Revolution.
- As part of the aquatic value chain, strengthening of fishing ports and fishing harbours is also one of the main thrust areas of the Government of India.
- **Technical Cooperation Programme (TCP)** – This initiative of the FAO intends to assist the Government of India to strengthen the technical capacities of fishing ports.
- It aims to address main environmental, social and economic challenges that affect the aquatic value chain.
- Two pilot fishing ports, specifically:
 - Vanakbara (Union Territory of Dadra and Nagar Haveli and Diu without legislation) and
 - Jakhau in Gujarat, will benefit from this TCP that will provide them with specific strategic and operational tools to identify and formulate investments projects, whose implementation would address main challenges.

What lies ahead?

- India's fisheries and aquaculture sectors are on a promising trajectory. Yet, sustainability must remain central.
- Managing fishing efforts through science-based stock assessments, promoting co-managed Monitoring Control and Surveillance (MCS) to curb IUU fishing, following Guidelines for Sustainable Aquaculture and embedding ecosystem-based approaches are key priorities.
- Strengthening certification, traceability, and digital tools – while ensuring inclusivity for smallholders – will enhance competitiveness in domestic and global markets.

- The FAO remains committed to supporting India's journey toward sustainable aquatic food systems, ensuring food and nutritional security, and reducing environmental and climate footprints, guiding India's Blue Revolution toward a resilient and inclusive future.

INDUSTRIES, INFRASTRUCTURE & INVESTMENTS

9.7 The Case for Energy Efficiency

Recently, India has doubled down on clean energy, yet the power you plug into today is dirtier than it was five years ago and this is a paradox that is at the heart of our energy transition.

What is the status of energy efficiency in India?

- **Energy efficiency** – It is using less energy to perform the same task, which reduces energy waste and lowers costs without sacrificing performance or comfort.
- It is achieved through technological innovations, improved systems, and changes in habits to reduce energy consumption and its associated environmental impact.
 - **For example**, using an LED lightbulb is more energy-efficient than an incandescent one because it produces the same amount of light while using significantly less electricity
- **India's energy mix** – As of June 2025, non-fossil fuel sources account for about 50% of India's total installed capacity.
- **India's grid emission factor (GEF)** – It has increased from 0.703 tCO₂/MWh in 2020–21 to 0.727 tCO₂/MWh in 2023–24, according to the Central Electricity Authority.
- **The Capacity–Generation Mismatch** – While renewables now account for a large share of installed capacity, they deliver far less electricity over the year compared to coal or nuclear.
- Solar and wind plants typically run at 15-25% capacity utilisation, versus 65-90% for coal and nuclear.
- In 2023-24, renewables (including hydro) supplied just 22% of total electricity; the rest was fossil fuel-powered.
- **Heavy dependence on coal** – The gap between headline capacity and actual delivered energy is widening, and India's fast-growing demand is being met by the most carbon-intensive source in the system that is coal.
- India's electricity demand also peaks when renewables are least available.
- **Issues with solar** – Solar floods the grid in the afternoon but fades by evening, just as peak loads from households surge.
- Fossil fuel plants, therefore, act as the system's shock absorbers – dispatched to meet night-time and peak demand – but they also lock in emissions.
- This temporal mismatch highlights the limits of capacity expansion alone.

Grid emission factor is a measure of the carbon intensity of electricity.

What are the roles of energy efficiency?

- **Energy efficiency** – It is often called the "first fuel", it reduces demand before supply even needs to be generated.
- By lowering the evening and night-time peaks, efficiency reduces reliance on coal when emissions are highest.
- **Scaling up efficient appliances** – Fans, air conditioners, and motors – and embedding efficiency in buildings and industrial processes can reshape this curve.
- The benefits extend beyond reduced coal consumption and enhanced opportunity for integrating renewables.
- **Meets demand surge** – Energy efficiency enhances flexibility by flattening demand peaks and allowing demand to align with renewable availability.



- It also prevents lock-in by replacing old, inefficient technologies early.
- **Evidence from India** – Concrete evidence from the Bureau of Energy Efficiency shows that India saved about 200 Million Tonnes of Oil Equivalent of final energy.
- It is equivalent to around 1.29 GT of CO₂eq, and close to ₹760,000 crore in savings, from FY2017-18 to FY2022-23.
- **International examples** – Countries such as France, Norway, and Sweden boast grid emission factors of just 0.1-0.2 tCO₂/MWh, largely thanks to large shares of hydro and nuclear electricity.
- India, at 0.727, starts from a coal-heavy base and faces relentless demand growth. This makes efficiency part of the core strategy, not just an option. Without it, renewables risk being stranded in the wrong hours.

What India needs to do?

- **Connection of batteries** – India, it must enable homes and offices to connect their batteries into virtual power plants, helping the grid glide over the peak demand.
- **Accelerate appliance efficiency standards** – It must move markets towards 4- and 5-star products and steadily raise benchmarks.
- **Support SMEs** – It must support small and medium enterprises (SMEs) to adopt efficient motors, pumps, and processes.
- **Flexible pricing** – It must enable flexible pricing by adopting tariff structures that reward consumers for shifting demand to periods of high renewable availability.
- **Incentives for scrappage** – It must introduce scrappage incentives for old, energy-guzzling equipment.
- **Enable DISCOMS potential** – It must enable electricity distribution companies to procure “electricity services”, such as green cooling, which allows for high-efficiency air conditioning powered by RTC clean power.

What lies ahead?

- The Central Electricity Authority’s National Electricity Plan projects a fall in India’s GEF to 0.548 by 2026-27, and 0.430 by 2031-32.
- Achieving this requires more than just building solar and wind farms.
- It demands a flexible system approach – with efficiency at the centre.
- India has grown its economy while cutting emissions intensity by 33% between 2005 and 2019, as noted in its Fourth Biennial Update Report to the UNFCCC.
- But the rising GEF calls for a balanced approach: accelerate supply-side investments in renewables, storage, and transmission, while embedding efficiency across households, industries, and cities.
- If India wants to actually decarbonise its grid, efficiency must become the first fuel – and flexibility, not fossil fuels, must power the future.
- To truly decarbonise, India needs flexibility along with more gigawatts. While Round-the-Clock (RTC) renewable electricity, at less than ₹5 per kWh, costs less than new coal-based power stations, upscaling is slow.
- We need policies that enable more land, transmission lines, and investment.

9.8 National Green Hydrogen Mission (NGHM)

India is reducing fossil fuel dependence and ramping up domestic clean energy production, in line with its vision of achieving Net Zero by 2070. In this transition, Green hydrogen is emerging as a scalable, clean fuel to decarbonize hard-to-abate sectors.

What is Green Hydrogen?

- **Definition** – Hydrogen produced **using renewable energy**, such as solar or wind power, instead of fossil fuels.
- **Process** – Water is split into hydrogen and oxygen via electrolysis powered by clean energy from solar panels or wind turbines.
- **Emission Standard** – As per Indian norms, it qualifies as “green” if emissions is very low, **not more than 2 kg of CO₂ equivalent for every 1 kg of Hydrogen produced.**

- **Alternate Source** – Green Hydrogen can also be produced by converting biomass (like agricultural waste) into hydrogen, as long as emissions remain below the same limit.

What is National Green Hydrogen Mission?

- **Launch** – In 2023, as an umbrella programme to develop a Green Hydrogen ecosystem (announced by the Prime Minister in **2021's Independence Day speech**).
- **Aim** – To catalyse a systemic response to sectoral opportunities and challenges and making India a global hub for the production of green hydrogen.
- **Nodal Ministry** – Ministry of New and Renewable Energy (MNRE).
- **Objectives**
 - Enhance industrial competitiveness, import reduction, and long-term energy security—linking sustainability with self-reliance.
 - Build the capacity and ecosystem required to position India as a global leader in clean hydrogen.

What are India's targets for Green Hydrogen by 2030?

- **Renewable Energy Expansion & Investment** – Develop **125 GW of renewable energy capacity** exclusively for green hydrogen production along with investments exceeding Rs. 8 lakh crore.
- **Employment generation** – Expected to create for over 6 lakh people through sectoral expansion.
- **Import Reduction** – Reduce fossil fuel imports by **more than Rs. 1 lakh crore**, and avoid nearly 50 MMT of greenhouse gas emissions every year by 2030.

What are the sectoral innovation & implementation under NGHM?

- The National Green Hydrogen Mission has an initial outlay of Rs. 19,744 crore till Financial Year 2029-30.
- **4 key pillars** –
 - **Policy & Regulatory Framework** – Enabling rules, standards, and incentives for green hydrogen adoption
 - **Demand Creation** – Sectoral pilots in steel, mobility, shipping, and fertilizers
 - **R&D & Innovation** – Strategic Hydrogen Innovation Partnership (SHIP) with BARC, ISRO, CSIR, IITs
 - **Infrastructure & Ecosystem Development** – Electrolyser manufacturing, renewable energy integration, certification systems.
- **Implementation Progress** (as of May 2025) -
 - 19 companies allocated 862,000 TPA green hydrogen production capacity.
 - 15 firms awarded 3,000 MW electrolyzer manufacturing capacity.
 - Pilot projects launched in steel, mobility, and shipping sectors.

What are the schemes and initiatives taken by the Government to accelerate production and use of green hydrogen?

- **Strategic Interventions for Green Hydrogen Transition (SIGHT) Scheme** –
 - A **financial incentive mechanism** with an outlay of Rs. 17,490 crore up to 2029-30 provides incentives for the manufacturing of electrolysers
 - Purpose – Financial incentives to boost domestic manufacturing of electrolysers that are used for production of green hydrogen.
- **Development of Green Hydrogen Hubs** –
 - In October 2025, the MNRE has announced the recognition of **3 major ports** – will serve as integrated centres for production, consumption, and future export.
 - Deendayal Port Authority (Gujarat),
 - V.O. Chidambaranar Port Authority (Tamil Nadu), and
 - Paradip Port Authority (Odisha).



- **Green Hydrogen Certification Scheme of India (GHCI) -**
 - **Launched** - In April 2025 to certify hydrogen as “green” based on lifecycle emissions to ensure transparency, traceability, and credibility for producers, consumers, and export markets.
 - **Criteria** – Hydrogen must be produced using renewable energy and emit ≤ 2 kg CO₂ equivalent per kg H₂.
 - **Mandatory Certification** – Required for facilities that receive government subsidies/incentives, or sell or use hydrogen domestically in India.
 - **Nodal Authority** – Bureau of Energy Efficiency (BEE) accredits agencies for monitoring and certification.
- **R&D initiatives under NGHM**
 - **Dedicated R&D Scheme** - Rs. 400 crore allocated to support 23 cutting-edge projects in - hydrogen production, storage, safety systems, and industrial applications.
 - **Start-up Support** - Rs. 100 crore Call for Proposals launched to fund start-ups innovating in hydrogen production, transport, storage, and utilization with funding up to Rs. 5 crore per project to promote cost-effective, scalable technologies.

What are the sectoral applications of green hydrogen under NGHM?

- **Fertilizers** – Replacing fossil-fuel-based feedstocks with Green Ammonia, the recent auction for 7.24 lakh metric tonnes per annum supply at Rs. 55.75/kg concluded.
- **Petroleum Refining** – Facilitating the replacement of fossil-based hydrogen with green hydrogen in refineries to reduce carbon footprint.
- **Steel** – 5 pilot projects was launched with public-private collaboration to focus on iron reduction, process innovation, safety, and cost-efficiency in Indian conditions.
- **Road Transport** – 5 pilot projects, 37 hydrogen vehicles (15 fuel cell + 22 ICE), 9 refueling stations across 10 different routes.
- **High-Altitude Mobility (Leh)** – NTPC in 2024 commissioned the world’s highest green hydrogen mobility project at 3,650 m, which includes 5 intra-city buses and a fueling station.

What are India’s global partnerships in the green hydrogen sector?

- **World Hydrogen Summit 2024** – India debuted with its 1st India Pavilion in Rotterdam, signaling global investment readiness.
- **EU–India Collaboration** – Over 30 joint proposals under the Trade and Technology Council on hydrogen production from waste.
- **India–UK Standards Partnership** – Workshop held in Feb 2025 to harmonize Regulations, Codes, and Standards (RCS) for safe and scalable hydrogen trade.
- **India–Germany (H2Global)** – SECI signed MoU with H2Global Stiftung (Nov 2024) to design market-based mechanisms and enable green hydrogen exports.
- **India–Singapore (Sembcorp)** – MoUs signed (Oct 2025) with V.O. Chidambaranar & Paradip Ports to build green hydrogen–ammonia hubs for production, storage, and export.

What lies ahead?

- Green hydrogen is central to India’s clean energy strategy, promoting a low-carbon and self-reliant economy.
- The National Green Hydrogen Mission boosts domestic production, innovation, and global market access.
- It reduces fossil fuel dependence, drives industrial transformation, and strengthens India’s leadership in the global energy transition.

10. ENVIRONMENT

10.1 Soil’s Organic Carbon

A recent detailed study conducted by the Indian Council of Agricultural Research (ICAR), has found that the unscientific use of fertilisers and climate change are contributing to degradation of organic carbon in arable areas of the country.

What is soil organic carbon?

- **Definition** – SOC is the carbon found in all stages of decomposition of organic residues in the soil.
- It is the major component of soil organic matter (SOM), making up about 58% of its mass.
- **Composition** – It includes a mix of compounds from fresh plant remains to more stable forms like humus and charcoal.
- **Formation** – It enters the soil primarily through photosynthesis, where plants convert atmospheric carbon dioxide, into organic compounds that are then added to the soil through roots, leaves, and other organic materials.

What is the importance of soil organic carbon?

- **Soil health and fertility** – Improves soil structure by helping soil particles clump together, which creates a crumbly texture and promotes better root expansion.
- Increases water holding capacity, providing plants with more available water.
- Serves as a source of nutrients for plants and a food source for soil organisms.
- **Environmental benefits** – It has several environmental benefits such as
- **Carbon sequestration** – Soils are the largest terrestrial carbon pool, and SOC acts as a carbon sink, absorbing and storing carbon from the atmosphere and helping to mitigate climate change.
- **Heat absorption** – If there is more carbon in soil, then there is more heat absorption.
- If the carbon content is lower, then the heat absorption in the soil will be less, and there will be more heat reflection from the ground creating greenhouse gas effect.
- **Climate resilience** – A healthy amount of SOC can help plants withstand extreme weather events like floods and droughts.
- **Water purification** – Soils with high carbon content are better able to filter and purify water.

What is the recent study?

- **Conducted by** – The study, primarily coordinated by the ICAR's Indian Institute of Soil Science in Bhopal.
- They covered 20 agro-ecological regions.
- **Samples used** – They have used 254,236 soil samples of 620 districts covering 29 States to reach the conclusions.
- **Mapping** – The team of scientists developed an 'agri-ecological base' map to assess the impact of cropping systems and the use of fertilisers on organic carbon.
- **Research paper** – It is based on the six-year-long study started in 2017 has been published now in the England-based international research journal '*Land Degradation & Development*.'

What are the findings of the study?

- **Nutrient – Carbon relationship** – The study has found that if the organic carbon is low, then the deficiency of micronutrients in the soil is high, and if the organic carbon is high, the deficiency is low.
- **3 important factors** – The study noted that irrespective of the crops and cropping patterns, temperature, rainfall and elevation are the three important factors which decide the organic carbon concentration in the soil.
- **Impact of latitude** – If the elevation of the land is high, then the organic carbon content is high.
- But if we move from hills to low land, then the organic carbon content is low.
- **Influence of Rainfall** – Rainfall will not have a significant impact, but with the temperature, it is highly negatively correlated.
- **Effect of temperature** – Organic soil carbon is negatively correlated with temperature.
- If the temperature is rising, then there are chances that soil organic carbon will decline further in future.
 - **For example**, in Rajasthan and Telangana, the temperature is very high and their organic carbon content is low.
- **Influence of cropping pattern** – The cropping system is very, very important in deciding the organic carbon content within the regions.

- Wherever rice-based cropping systems or pulse-based systems are there, the organic carbon content is a bit higher than the areas that followed wheat and coarse-grain cropping systems.
- For rice, where we have to apply more water, the microbial activities are very high, helping in sequestering more carbon in soil.
- The scientists have prepared a map which can help in making policy decisions, particularly for the carbon credit and assessing the land degradation.
- They have also addressed questions such as rice food system has degraded the land and the extent of its degradation.
- **Effect of fertilizers** – Wherever Imbalanced fertiliser application was there, then the organic carbon contained in the soil had declined.
 - Haryana, Punjab, and parts of Western Uttar Pradesh have intensified the fertiliser application, has negatively impacted organic carbon in the soil.
 - But in States like Bihar, where balanced application of fertilisers can be seen, the situation is better.
- **Consequence of climate change** – It will have an impact on organic carbon, the study noted.

What lies ahead?

- The scientists have suggested that the country should cover all the soils with crops and should try to establish a large number of plantations in the country.
- Wherever soils have very low carbon, less than 0.25%, the governments should promote organic carbon sequestration so that farmers can develop some sort of a cropping system, with increased irrigation facilities.
- We should give incentives to these farmers, who are able to trap more carbon dioxide from the soil, and they are converting it into organic carbon.
- We must find out different crop management options for climate change mitigation.

10.2 Environmental, Coastal and Forest Clearance for Projects

In the wake of a real estate project that has come up allegedly inside the Pallikaranai marshland one of Chennai's most ecologically sensitive zones and a Ramsar-notified wetland questions have surfaced about how large projects obtain environmental approvals.

What is Environmental Clearance (EC)?

- **Legal basis** – Under the Environment Impact Assessment (EIA) Notification, 2006, issued under the Environment (Protection) Act, any project that could significantly alter land use or affect air, water, or ecosystems must obtain prior Environmental Clearance (EC).
- This includes large housing projects, industrial estates, power plants, mines, and infrastructure such as ports, airports, and highways.
 - **For instance**, any residential or commercial development with a built-up area of 20,000 square metres or more requires clearance before construction.
- **Submission of project details** – The process begins with the submission of project details.
- **Screening** – Screening and scoping is done by the appraisal committee to decide the studies required.
- **EIA report** – A detailed Environmental Impact Assessment (EIA) report is then prepared, and a public hearing is conducted in the proposed project area.
- **Approval** – The committee reviews the findings and submits its recommendation, after which the SEIAA or the MoEF&CC issues the final clearance, often with conditions such as waste management, flood mitigation measures or maintaining green cover.
- **Approval authority** – Projects are categorised based on their size and impact.
 - **Category A projects** – They are usually large or located in sensitive areas such as national parks or coastal zones.
 - They are appraised at the national level by the Ministry of Environment, Forest and Climate Change (MoEF&CC).
 - **Smaller Category B projects** – They are cleared at the state level by the State Environment Impact Assessment Authority (SEIAA).

- SEIAA relies on the technical assessment of its State Expert Appraisal Committee (SEAC).
- **Validity & Renewal** – Environmental clearances are usually valid for 7 years and must be renewed if the project is delayed.

What is the process for clearance in coastal regulation zones (CRZ)?

- **Legal basis** – For projects near the coast, the Coastal Regulation Zone (CRZ) Notification, 2019, applies.
- **Regulation** – It regulates activities within 500 metres from the High Tide Line and along tidal water bodies such as creeks and estuaries.
- **Projects included** – Projects such as resorts, ports, pipelines, roads, and power plants within these areas need CRZ clearance.
- **Scrutiny** – The State Coastal Zone Management Authority (SCZMA), examines the location of the project and determines whether it falls within the regulated coastal zone using approved maps.
- **Approval** – The proposal is then sent to the MoEF&CC for final approval if it involves major construction or lies in the most sensitive CRZ-I category.
- In the Pallikaranai case, CRZ rules are not directly applicable since the wetland lies inland, but for developments along Chennai's coast, such clearances are mandatory.

What is the process for Forest clearance?

- **Legal basis** – Projects involving forest land require prior approval under the Forest (Conservation) Act, 1980.
- Any diversion of land recorded as forest whether reserve forest, protected forest, or deemed forest, must be cleared by the union government before being used for non-forest purposes.
- **Proposal** – The proponent must submit the proposal to the State Forest Department along with land details and a compensatory afforestation plan.
- **Scrutiny** – After State-level scrutiny, the proposal is sent to the MoEF&CC's Forest Conservation Division.
 - Projects involving smaller areas (up to 40 hectares) are usually cleared by the ministry's regional office.
 - Larger or ecologically sensitive proposals are decided by the union ministry itself.
- Only after such clearance can forest land be legally diverted for other uses.
- **Prohibited area** – Construction and reclamation are prohibited within wetlands and Ramsar sites under the Wetlands (Conservation and Management) Rules, 2017.
- Any project proposed within or near such areas must be referred to the State Wetland Authority and the MoEF&CC for scrutiny.
- These layers of approval are meant to ensure that development does not compromise ecological stability or worsen the risk of flooding and habitat loss.
- **Challenges** – But gaps in mapping, interpretation of rules, and overlapping jurisdictions often lead to ambiguities in implementation.

10.3 Kunming Biodiversity Fund - A Tool for a Sustainable World

Recently, 7 countries have secured \$5.8 million from the Kunming Biodiversity Fund to enhance nature-friendly agriculture.

What is Kunming biodiversity fund (KBF)?

- **KBF** – It was created by China's Ministry of Ecology and Environment together with the UN Environment Programme and other partners.
- **Launched** – In 2021 during Part 1 of the 15th Conference of Parties to the Convention of Biological Diversity, with an initial pledge of 1.5 billion yuan (about \$200 million) from China to help developing countries protect biodiversity and implement KMGBF.
- **Aim** – This is a part of the *Kunming-Montreal Global Biodiversity Framework* (KMGBF), aims to bridge the finance gap in global conservation efforts.
- In a move underscoring the growing link between food systems and nature, several new funding mechanisms have been created to bridge the persistent finance gap that hinders global conservation goals.

- One such initiative is the Kunming Biodiversity Fund (KBF) from which the Food and Agriculture Organization (FAO) of the United Nations has helped seven countries secure \$5.8 million in grants.
- **Beneficiary countries** – This fund will support projects in Cook Islands, Madagascar, Mexico, Nepal, Sri Lanka, Turkey and Uganda.
- **Aim of the projects** – The projects aim to make farming systems more nature-friendly and help countries meet global biodiversity targets.
- These efforts are part of the Kunming-Montreal Global Biodiversity Framework (KMGBF).

What is Kunming-Montreal Global Biodiversity Framework?

- **Adoption** – It was adopted during the fifteenth meeting of the Conference of the Parties (COP 15) following a 4-year consultation and negotiation process.
- It is a global plan adopted by 196 countries in 2022 to stop and reverse biodiversity loss.
- This historic Framework, which supports the achievement of the Sustainable Development Goals and builds on the Convention’s previous Strategic Plans, sets out an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050.
- **Goals** – There are 4 goals for 2050.

4 Overarching Global Goals of KM-GBF

<p>Halting human-induced extinction of threatened species and</p> <p>Reducing the rate of extinction of all species tenfold by 2050</p>	<p>Sustainable use and management of biodiversity to ensure that nature’s contributions to people are valued, maintained and enhanced</p>	<p>Fair sharing of the benefits from the utilization of genetic resources, and digital sequence information on genetic resources</p>	<p>Adequate means of implementing the GBF be accessible to all Parties, particularly Least Developed Countries and Small Island Developing States</p>
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- **Targets** – It has 23 targets for 2030.

2030 Action Targets	1 Land and Sea-Use Planning	2 Ecosystem Restoration	3 Protect and Conserve Land and Sea	4 Active Management of Species and Genetic Diversity	5 Harvest, Trade and Use of Wild Species
	6 Invasive Alien Species	7 Reduce Pollution	8 Minimize the Impact of Climate Change	9 Sustainable Use and Benefit-Sharing	10 Sustainable Management of Agriculture, Aquaculture and Forestry
	11 Regulation of Air, Hazards and Extreme Events	12 Increase Access to Green and Blue Spaces	13 Access and Benefit-Sharing	14 Mainstreaming Biodiversity	15 Sustainable Production and Supply Chains
	16 Eliminate Unsustainable Consumption	17 Manage Impacts of Biotechnology	18 Eliminate Harmful Incentives	19 Resource Mobilization	20 Strengthen Capacity-Building and Development
		21 Traditional Knowledge, Awareness, Education and Research	22 Equitable and Effective Participation in Decision-Making	23 Implement Gender-Responsive Approach	

- **Implementation** – The implementation of the Kunming-Montreal Global Biodiversity Framework will be guided and supported through a comprehensive package of decisions also adopted at COP 15.
- **Monitoring framework** – This package includes a monitoring framework for the GBF
 - An enhanced mechanism for planning, monitoring, reporting and reviewing implementation.
 - The necessary financial resources for implementation.
 - Strategic frameworks for capacity development and technical and scientific cooperation.
 - An agreement on digital sequence information on genetic resources.
- **Commitment of the countries** – In adopting the Kunming-Montreal Global Biodiversity Framework, all Parties committed to setting national targets to implement it.
- All other actors have been invited to develop and communicate their own commitments.
- **Target 19** – One key finance target (target 19) calls for mobilising at least \$200 billion per year by 2030.
- The sources includes public, private, domestic and international.
- At least \$30 billion per year by 2030 in international finance to developing countries.
- **Closing the biodiversity gap** – The biodiversity finance gap is estimated to be around \$700 billion per year.
- To close this gap, countries and organisations have introduced several new biodiversity funds over the past few years.
- **Cali fund** – It is one of the biodiversity funds launched in 2025, which channels resources from companies that use digital sequencing information on genetic resources.
- At least half of its proceeds are directed to Indigenous Peoples and local communities, recognising their key role in conserving and sustainably using biodiversity.
- The fund marked a major step toward fair benefit-sharing from the commercial use of genetic resources and associated data.

What will the new funding do?

- **Mainstreaming biodiversity into agrifood systems (Madagascar, Uganda, Mexico)** – Aligning national biodiversity strategies and action plans with agriculture, building institutional capacity, improving incentives for biodiversity-friendly farming and ramping up knowledge sharing.
- **Empowering communities (Cook Islands)** – Strengthening data systems (ecosystem classification, biodiversity database), promoting sustainable agroecology practices rooted in traditional knowledge, with special focus on women and youth.
- **Managing invasive alien species (Nepal)** – Community-based and participatory approaches to tackle invasive species that harm biodiversity and local livelihoods.
- **Preventing & controlling invasive species (Sri Lanka)** – Enhancing border biosecurity, training frontline teams, raising public awareness, and engaging local communities in removal and prevention efforts.
- **Strengthening ecosystem resilience around Lake Eğirdir (Turkey)** – Promoting water-efficient agriculture, biodiversity-friendly practices, and sustainable livelihoods and raising public awareness for ecosystem protection.

What lies ahead?

- At the next meeting of the Conference of the Parties, the world will take stock of the targets and commitments that have been set.
- The funding will help developing countries achieve biodiversity goals through sustainable agriculture, strengthen food diversity and support climate solutions.

10.4 Western Ghats – Natural Site of Significant Concern

Recently, serious concerns were raised over India's ecologically vital landscapes, including the Western Ghats, in the World Heritage Outlook 4 (2025) report released by (IUCN).

What is the report?

- **Report** – World heritage outlook

- **Published by** – IUCN (International union for conservation of nature).
- **Categories** – The report categorises the natural sites as “
 - Good
 - Good with some concerns
 - Significant concern
 - Critical.
- **Recent Assessment** – The report, which assesses 271 natural and mixed World Heritage sites, categorises the Western Ghats and two national parks in India – Assam’s Manas national park and West Bengal’s Sundarbans national park – as being of “significant concern”.

What are world heritage sites?

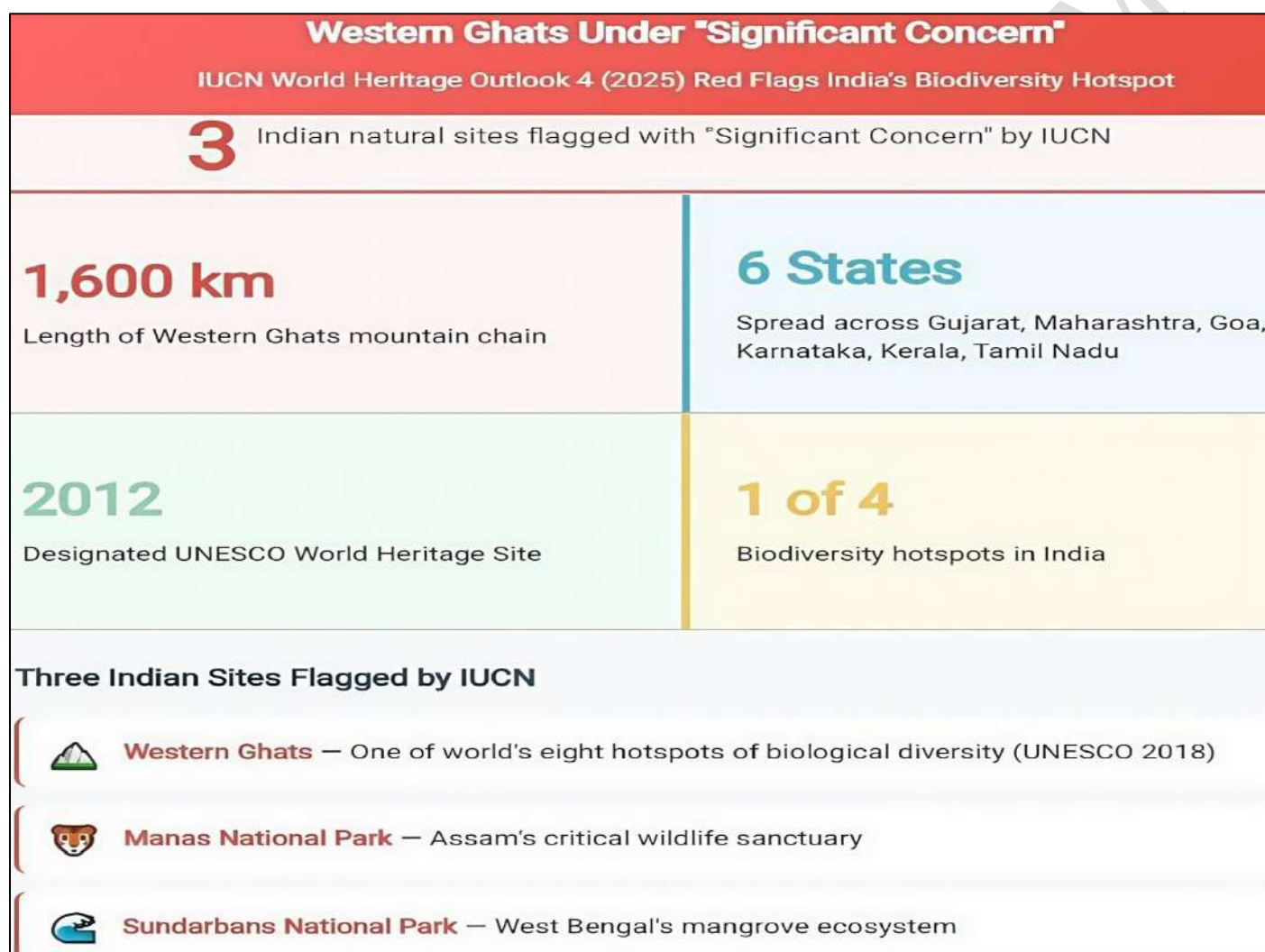
- **Recognition** – The 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage is the primary instrument that provides for the designation and conservation of World Heritage Sites.
- The convention was adopted by UNESCO and formally came into effect in 1975 after 20 countries ratified it.
- **3 categories** – The document classifies the World Heritage sites into three categories
 - Natural heritage sites,
 - Cultural heritage sites, and
 - Mixed sites.
- The UNESCO World Heritage Committee is the primary body that is responsible for administering the convention.
- **Selection process** – The selection of world heritage sites follows a well-defined and rigorous process, and is guided by scientific evaluation by IUCN (for natural sites) and International Council on Monuments and Sites (ICOMOS) (for cultural sites).
- **Final decision** – The final decision is made by the World Heritage Committee, which is composed of representatives from member countries.
- **Criteria** – To be designated as a World Heritage site, a site must possess ‘Outstanding Universal Value’ and meet at least one of the selection criteria provided under the operational guidelines of the Convention.
- As the convention set out the duties of state parties, the designation requires stronger legal and physical protection of the sites.
- **World data** – There are a total of 1,248 World Heritage Sites in the world.
- **Indian data** – 44 of World heritage site located in India (including 36 cultural, 7 natural, 1 mixed).
- The Western Ghats is one of the natural sites in India, which was designated a UNESCO World Heritage Site in 2012.
- As of September 2025, a total of 69 sites from India are under consideration by UNESCO, comprising 49 cultural, 17 natural, and 3 mixed heritage properties.
- World heritage sites are sites of ‘Outstanding Universal Value’ to humanity.

What is the Western Ghats?

- **The Western Ghats** – It is also known as the Shayadari hills, hold immense ecological and biodiversity value, making them one of the most critical natural assets of India and the World.
- **States covered** - It stretches along the western coast of the Indian peninsula, spanning six states – Gujarat, Maharashtra, Goa, Karnataka, Kerala, and Tamil Nadu.
- **Significance** – The region has outstanding universal value due to its exceptional biodiversity, endemism, and its role in maintaining vital ecological and climatic processes.
 - Ecologically, the Western Ghats serve as a crucial climatic regulator for peninsular India.
 - Acting as a barrier to the South-West monsoon, the range ensures high supporting lush forests and numerous rivers that sustain millions of people.
 - They also hold immense genetic resources, including wild relatives of many economically important crops and spices such as pepper, cardamom, and cinnamon.

- The Ghats are also home to diverse ecosystems, including tropical evergreen forests, grasslands, Myristica swamps, and the distinctive shola forest.
- These ecosystems harbour a wide variety of flora and fauna, many of which are endemic.
- Western Ghats are the habitat for several threatened species, such as lion-tailed macaque, Nilgiri Tahr, and tiger.
- Around 325 species in the region are listed as threatened in the IUCN Red List, out of which 129 are classified as Vulnerable, 145 as Endangered, and 51 as Critically Endangered.
- Thus, the Western Ghats hold significance not only for India but for the entire world, serving as a global biodiversity treasure.

Western Ghats are among the **four** of the world's 36 biodiversity hotspots located in India. The **other three biodiversity hotspots** are the Himalayas, the Indo-Burma region, and the Sundaland.



What are the major threats highlighted in the report?

- **Climate change** – It is red-flagged as the most prevalent threat to natural heritage sites in Asia. Climate impacts such as rising temperatures, changing rainfall patterns, and melting glaciers are accelerating biodiversity loss and altering ecosystems.
- **Tourism-related activities** – These continue to be the second biggest threat. Unregulated tourism increases waste generation, disturbs wildlife, and puts pressure on natural resources, particularly in ecologically sensitive regions.
- **Invasive species** – The report also highlights the growing problem of invasive alien species as the third most significant threat.
- These species disrupt native ecosystems, reduce biodiversity and affect the regeneration capacity of forests.
- **Infrastructure development** – For the first time the activities such as road and railway expansion, has been listed among the threats.

- **Other threats** – Additionally, anthropogenic pressures, such as encroachment, logging, waste disposal, and agricultural expansion, continue to degrade habitats even within protected areas.
- Overall, the report reflects a concerning trend: localised human threats are now compounded by large-scale systematic pressures, especially climate change and infrastructure development, which collectively endanger the ecological integrity of Asia's most valuable natural sites, including the Western Ghats.

What are the efforts by the Indian government to protect the Western Ghats?

- **Policy frameworks** – At the policy level, the National Forest Policy, 1988, the National Environment Policy, 2006, and the National Wildlife Action Plan guide forest conservation, biodiversity protection, and sustainable development.
- **Legal measures** – On the legal front, the government has enacted the Wildlife Protection Act, under which many parts of the Western Ghats have been declared as protected areas, such as National Parks, Wildlife Sanctuaries, Conservation Reserves, Tiger reserves, etc.
- These legal safeguards help minimise anthropogenic activities to protect wildlife and plant species.
- To protect the forests and to curb deforestation, the Indian Forest Act of 1927, and Van (Sanrakshan Evam Samvardhan) Adhinyam, 1980, have been enacted.
- These laws prohibit the conversion of forest land into non-forest land without the permission of the central government.
- **Committees** – Moreover, to assess the negative impact of anthropogenic activities in the Western Ghats, the Ministry of Environment, Forests, and Climate Change (MoEFCC) formed two expert panels – the Madhav Gadgil committee and the Kasturirangan committee.
- Based on their reports, a draft notification was issued in 2024 under the Environment Protection Act, 1986, to declare an area of around 56,000 sq. km spread across six states of Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu as ecologically sensitive area (ESA).
- **Institutional measures** – The ESA is buffer areas demarcated around protected areas to minimise the negative impact of anthropogenic activities such as mining, hydropower projects, etc.
- However, the draft notification was opposed due to its potential negative impact on local livelihoods and development. It has not been implemented.

What lies ahead?

- The Outlook 4 offers a timely reminder that the Western Ghats are under increasing threat and require urgent and coordinated action. Despite the enactment of laws and policy, weak implementation remains the main concern.
- Also, the increasing anthropogenic pressure needs to be controlled. For this, the timely implementation of the draft ESA notification would be a decisive step.
- However, it must be based on participatory decision-making by the government and the local bodies to balance conservation and community livelihoods.
- Such an approach would harmonize environmental protection with responsible economic activities.
- In addition to this, integrating scientific monitoring, climate adaptation strategies, and community-led conservation would strengthen resilience against climate change and habitat degradation.
- Protecting the Western Ghats is not merely an environmental priority but a national necessity, vital for the environment, biodiversity and climate stability.

11. SCIENCE & TECHNOLOGY

11.1 National Blockchain Framework – Strengthening Governance through Blockchain Technology

Recently, India is infusing the blockchain technology in many aspects of governance through the National blockchain framework.

What is the National blockchain framework (NBF)?

- **Launched on** – National Blockchain Framework was launched in September 2024 with a 64.76 crore rupees budget.

- **Crucial landmark for governance** – It marks India’s strategic step towards developing a secure, transparent, and scalable digital governance infrastructure.
- It provides a unified architecture to deploy blockchain-based applications across public sectors, ensuring trust, transparency, and accountability in governance.
- As of 21 October 2025, over 34 crore documents have been verified on blockchain platforms deployed under the NBF.

What is blockchain technology?

- **Definition** – Blockchain is a distributed, transparent, secure, and immutable digital ledger that records transactions across a network of computers. It ensures data integrity and eliminates the need for intermediaries.
- Types of Blockchain –
 - **Public Blockchain** – In this network, all nodes can access records, verify transactions, perform proof-of-work, and add new blocks.
 - **Private Blockchain** – It is a permissioned blockchain, restricted to selected participants within an organization.
 - The controlling entity determines the levels of security, authorization, and access, making it ideal for government applications.
 - By design, it enhances trust among participants while ensuring data confidentiality and operational efficiency.
 - **Consortium Blockchain** – In this network, the blockchain is semi-decentralized, governed jointly by multiple organizations for shared data management and validation.
 - **Hybrid Blockchain** – It is a blend of public and private blockchains allowing selective data access.
- **Core strengths** – Transparency, Immutability, Decentralization, and Trust, these form the foundation of the NBF.

Why blockchain for governance?

- **Centralised database** – India’s administrative systems rely heavily on centralized databases, prone to fraud, data breaches, and inefficiency.
- **Potential of blockchain** – Blockchain’s tamper-resistant distributed architecture ensures:
 - Verifiable trust without intermediaries,
 - Reduced corruption,
 - Faster service delivery,
 - Enhanced data integrity.

What are the key components of the national blockchain framework?

- **Vishvasya Blockchain Stack** – It serves as the technical backbone of the NBF.
- It is a modular and indigenous platform developed by the National Informatics Centre (NIC).
- It has the following features:
 - **Blockchain-as-a-Service (BaaS)** – It allows departments to deploy blockchain applications without creating their own infrastructure.
 - **Distributed Infrastructure** – It is deployed across NIC Data Centres in Bhubaneswar, Pune, and Hyderabad, ensuring fault tolerance and scalability.
 - **Permissioned Blockchain** – Only verified participants can validate transactions.
 - **Open APIs** – Ensures smooth integration with e-Governance platforms.
- **NBFLite – Sandbox for Startups and Academia** – It is a lightweight version of the blockchain stack for innovation and experimentation.
- It enables startups, researchers, and students to:
 - Build prototypes without large-scale deployment,
 - Use smart contract templates in governance areas such as Supply Chain and Digital Certificates.
- This promotes capacity building and innovation in the blockchain ecosystem.

- **Praamaanik – App Verification System** – It is developed to counter malicious and fraudulent mobile apps.
- Praamaanik uses blockchain to:
 - Verify authenticity and source of applications,
 - Match app data with blockchain records,
 - Ensure trust and safety in the digital marketplace.
- **National Blockchain Portal** – It is a centralized platform that documents India’s blockchain strategy, promotes standardization, and cross-sector adoption.
- It supports both governance and industry use cases, showcasing India as a global blockchain leader.

What are uses of blockchain in governance?

- **Certificates and Document Chain** – It solves the problem of fraudulent documents and delays in verification.
 - **Certificate Chain** – It is used by CBSE for storing academic certificates securely.
 - **Document Chain** – It is a standardized system for government-issued documents (caste, income, birth/death certificates, etc.).
- As of October 2025, 34 crore documents verified, including 48,000 on Document Chain.
- **Logistics Chain** – It enables traceability and transparency across supply chains.
- It is used in Aushada, Karnataka’s medicine supply chain system.
- Tracks movement from manufacturer to hospital, ensuring quality and authenticity.
- Helps patients verify drug details, preventing spurious medicines.
- **Judiciary Chain** – It introduced to digitize and secure judicial processes.
- It records judicial data with time-stamped immutability.
- It enables electronic notices, summons, and bail orders.
- 665 judiciary documents verified as of October 2025.
- **Inter-Operable Criminal Justice System (ICJS)** – It integrates the entire criminal justice ecosystem from police to judiciary.
- Creates a unified blockchain platform for case records and evidence.
- 39,000+ ICJS documents verified on the blockchain (Oct 2025).
- **Property Chain** – It addresses land and property disputes through transparent transaction records.
- Stores full property ownership history on blockchain.
- Reduces litigation, prevents fraudulent transfers, and speeds up land registration.
- Over 34 crore property-related documents verified via blockchain.
- **Future prospects** – The government is exploring new blockchain-based Proof of Concepts (PoCs) in various domains:
 - **Land Records** – Secure ownership verification
 - **Blood Bank** – Transparent donation tracking
 - **GST Chain** – Real-time tax data monitoring
 - **Public Distribution System (PDS)** – Prevents leakages and fraud in food supply
- These initiatives aim to promote interoperability, citizen trust, and digital transformation.

What are the institutional and regulatory support?

- **National Strategy on Blockchain** – It is developed by MeitY, this strategy outlines short-term and long-term goals, including:
 - Integration across public sectors,
 - Development of national standards, and
 - Building interoperability between blockchain systems.

- **Centre of Excellence (CoE) in Blockchain Technology** – It is set up by National Informatics Centre (NIC).
- The CoE provides:
 - Consultancy, training, and support for pilot projects,
 - ICT infrastructure for blockchain adoption,
 - Collaboration with global platforms like Hyperledger Fabric, Ethereum, and Sawtooth.
- **Telecom Regulatory Authority of India (TRAI)** – It implemented Distributed Ledger Technology (DLT) for telecom regulation.
- It registers Principal Entities and Telemarketers for SMS tracking.
- It reduces spam and fraud.
- 1.13 lakh entities registered with DLT across sectors in coordination with RBI, SEBI, NIC, and C-DAC.
- **Reserve Bank of India (RBI)** – It is using blockchain for Digital Rupee (e-Rupee) pilots since December 2022.
- It enables instant, transparent, and traceable financial transactions.
- It promotes financial inclusion and secure digital payments.
- **National Securities Depository Limited (NSDL)** – It adopted blockchain for Debenture Covenant Monitoring.
- It enables tracking of asset charges and covenant compliance.
- It provides tamper-proof, time-stamped audit trails for investor confidence.

What is the capacity building in blockchain technology?

- **Skill Development Programmes** – To ensure sustainable adoption, MeitY and its partners have introduced multiple training and education programs.
- The ministry has conducted 214+ programs, training 21,000+ officials.
- It focusses on practical blockchain application in governance.
- **PG Diploma in FinTech & Blockchain Development (PG-DFBD)** – It is A 900-hour comprehensive course covering Blockchain, FinTech, AI/ML, Cybersecurity, and Regulations.
- It trains professionals for careers in emerging technologies.
- **BLEND Programme by C-DAC** – It is an online training for engineering students and professionals.
- It covers blockchain architecture, components, and real-world use cases.
- **FutureSkills PRIME** – It is a national reskilling initiative by MeitY.
 - It trains youth and professionals in 10 emerging technologies, including blockchain.
 - It strengthens India's digital workforce.

What lies ahead?

- The National Blockchain Framework reflects India's commitment to Digital India and Aatmanirbhar Bharat.
- By embedding trust and transparency into digital systems, the NBF is revolutionizing governance and service delivery, fostering innovation and skill development, and positioning India as a global leader in blockchain governance.
- With over 34 crore verified documents and expanding use cases across governance, judiciary, and finance, India is building an interoperable blockchain ecosystem that ensures inclusive, efficient, and accountable digital growth.

11.2 Typhoid Conjugate Vaccine

Recently, Bangladesh became the eighth country in the world to introduce the Typhoid Conjugate Vaccine (TCV) and nearly 50 million children from 9 months to 15 years will receive the vaccine as part of a campaign, after which the vaccine will be integrated into their routine immunisation programme.

What is Typhoid conjugate vaccine?

- **A TCV (Typhoid Conjugate Vaccine)** – It is a type of vaccine that provides protection against typhoid fever.
- **Dose** – It is a single-dose injection that stimulates the body to produce antibodies against the Salmonella Typhi bacteria.
- **Efficacy** – They are particularly effective because they can be given to infants and young children, unlike older typhoid vaccines that have age restrictions.
- **Status in India** – Despite the fact that India produces this vaccine and carries half the world's burden of the disease, it is yet to become part of the country's routine childhood vaccinations
- **Typbar TCV** – It is one of the first Typhoid Conjugate Vaccines to be prequalified by WHO in 2017.
- It was manufactured by *Bharat Biotech* which had started manufacturing it in 2013.
- India is the major vaccine supplier for this drive, but is not one of the eight countries to have the typhoid vaccine in its routine immunisation schedule.

India's neighbours, including Nepal, Pakistan and Bangladesh, have already begun inoculating their children with the typhoid vaccine.

What is the epidemiology of Typhoid?

- **Causative agent** – The bacterium *Salmonella typhi* is the primary cause of typhoid fever.
- **Transmission** – It is transmitted between humans directly from faecal and/or urinary contamination of food and water or via vectors such as flies.
- It survives easily in milk without an alteration in taste, and also in ice.
- Untreated, asymptomatic humans can also carry and shed the pathogen in their faeces for two months up to several years.
- **Symptoms & Effects** – Fever in typhoid can last for several weeks.
- Severe complications such as intestinal perforation can lead to death.
- Children are disproportionately affected, leading to loss of schooling and activity days.
- **Burden** – The World Health Organization (WHO) estimates *9-12 million people* being affected by typhoid annually and over 100,000 deaths, with India, Bangladesh and Pakistan as hotspots.
- Travel to and from endemic countries takes it to places.
- The disease is under control in some countries with better sanitation, better diagnostics and surveillance, stringent prescription practices and travel vaccination.

What does the data on India reveal?

- **Effect on children** – Extensive SEFI (Surveillance for Enteric Fever in India) study was done between 2017-2020 in 10 urban and rural sites.
- The incidence per 1,00,000 child-years ranged from 576 to 1,173 cases with higher numbers in poorer urban areas, compared to rural areas.
- **Migrational hazards** – However, extensive labor migration between urban and rural areas allows easy to and fro transport of the pathogen.
- **Mortality** – Geostatistical modeling using these findings and national health survey data estimates 4.5 million cases annually with 8,930 deaths.
- This clearly shows that India contributes to half the global burden of typhoid fever.
- **Future forecasts** – If no action is taken, projections estimate 4.6 crore cases and 89,300 deaths annually in almost all age groups in urban areas, and in young adults in rural areas.

What are the issues and challenges in combating typhoid?

- **Diagnostic gaps** – Typhoid can mimic dengue, scrub typhus, malaria, COVID-19 and other febrile conditions.
- Hence, besides good clinical acumen, robust and accessible diagnostic support is important.
- The recommended test to detect the pathogen is a blood culture, but this is not easily available everywhere.
- Facilities to perform reliable antimicrobial susceptibility testing are also lacking.
- WIDAL, an unreliable blood antibody test, is still around and is extensively misused.

- Unregulated irrational therapy of febrile illnesses complicates the picture.
- **Antibiotic resistance** – From the 1950s onwards, the bacteria has shown increasing resistance to common antibiotics.
- Treatment of typhoid fever now is usually with azithromycin and ceftriaxone.
- However, ceftriaxone resistance and reduced response to azithromycin has been found as recently as in 2021-2024.
- These drugs are commonly abused both in rural and urban India.
- With the presence of extensively drug resistant (XDR) typhoid strains already in Pakistan, the threat is imminent in India.
- Rising drug resistance means lesser options to treat the illness and also increase in treatment costs.
- **Sub-optimal sanitation** – Despite progress under the Swachh Bharat Mission and Jal Jeevan Mission, issues related to safe water persist.
- While access to water is steadily increasing, water quality remains questionable.
- Only 6% of urban households across 302 districts have safe water supply and in rural areas, the situation is worse.
- Periodic environmental surveillance is also limited and dissatisfactory.

What needs to be done?

- **Vaccine introduction** – In its position paper in 2018, the WHO had strongly recommended typhoid vaccination, particularly the typhoid conjugate vaccine (TCV).
- TCV is available in the private sector for around Rupees,2,000, this high cost leaves out many who are most likely to be affected by the infection.
- Hence, it is imperative to include it in the *Universal Immunisation Programme (UIP)*, to ensure health equity
- **Combination of measures** – Introducing the Typhoid vaccine alone is not important.
- The vaccine should be accompanied by:
 - Environmental and disease surveillance,
 - WASH (Water, Sanitation and Hygiene) measures,
 - Improving diagnostics including resistance mapping,
 - Regulation of prescriptions
 - Post-vaccination efficacy studies should all take place as well.

What are the backings for the vaccine?

- **Cost effective** – TCV is one of the newer vaccines, and has shown better results while also being cost effective.
- **More efficient** – It can be given as a single shot and has been found to be effective for 3-10 years.
- **Safety** – This vaccine can also be safely co-administered with other routine childhood vaccines from the age of six months.
- **Promising results of field trials** – In 2018, field trials in Navi Mumbai supported the credibility of the TCV vaccine.
- Over 1 lakh doses were administered and the cost calculation worked out to USD1.87/dose, which is considerably lower than the cost of contracting the disease.
- **Experts support** – The National Technical Advisory Group on Immunisation (NTAGI) has been mulling over this for nearly a decade now.
- Back at the 12th NTAGI meeting, in 2016, it was recommended that typhoid surveillance be improved for future discussions and for recommendations on typhoid vaccine use in India.
- Subsequent meetings of NTAGI have repeatedly brought up typhoid vaccination but there has been no progress with regard to its being included in the UIP.
- **International collaboration** – In 2023, *the vaccine alliance GAVI*, entered a strategic three-year partnership of \$250 million with the government of India.

TCV by Serum Institute of India and one by Zydus Lifesciences, yet again asserting India's position as the vaccine hub of the world.

- It was to help introduce TCV into the UIP, along with support for other vaccination initiatives.
- Two years into the partnership however, there has been no action on the typhoid vaccine.

GAVI is the Vaccine Alliance, a public-private partnership that provides vaccines to children in the world's poorest countries to protect them from deadly diseases.

What lies ahead?

- The silence towards typhoid is baffling. India's neighbors, Pakistan, Nepal, Bangladesh have already surged ahead.
- India with more than half the global burden of enteric illness, must join them and other countries responsibly, sooner than later.
- Typhoid, a preventable disease, has haunted people in India for centuries.
- Every year, due to ambiguous diagnosis, inadequate treatment, drug resistance and slow progress in sanitation, countless lives, especially of children, are lost and many are pushed into poverty.
- We have the vaccine innovation skills, but inclusion is lacking.
- The time is long overdue and the ground uber-fertile now, for the introduction of the typhoid vaccine into the country's routine immunisation programme.

11.3 India's Sanitation Journey

Recently, World Toilet Day is observed to raise awareness about the global sanitation crisis and the importance of safe toilets for all.

What is world toilet day?

- **Observed on** – **November 19** of every year.
- Officially designated as a United Nations observance in 2013.
- **Importance** – It highlights toilets as vital for health, dignity, equality, and sustainability.
- **Supports SDG** – It directly supports Sustainable Development Goal 6: Clean Water and Sanitation, aiming for universal access by 2030.

What is the importance of proper sanitation?

- **Basic need** – Access to safe toilets and proper sanitation is essential for public health, dignity, and environmental sustainability.
- **Disease reduction and environmental protection** – Improved sanitation reduces waterborne diseases, enhances productivity, and safeguards the environment.
- **Promotes equality** – It also empowers women and children by providing safety, privacy, and better educational opportunities.
- **Ensures dignity** – In today's era of climate change, rapid urban expansion, and persistent inequality, secure sanitation continues to be a foundation for human dignity, community well-being, and sustainable progress.

What are the schemes and programmes in India to promote sanitation and hygiene?

- **Swachh Bharat Mission (SBM)** – It has been the flagship program, aiming to eliminate open defecation and provide universal toilet access in both rural and urban areas.
- India has seen a transformation in its sanitation drive since the launch of the Swachh Bharat Mission, which transformed access to toilets and hygiene facilities across rural and urban areas.
- **Launch of Swachh Bharat Mission (2014)** – Announced on 2nd October 2014, the mission aimed to eliminate open defecation and improve solid and liquid waste management.
- **2 components:**
 - **SBM** – Gramin (rural)
 - **SBM** – Urban (cities and towns).
- Under this initiative in October 2019, all villages, districts, and states were declared Open Defecation Free (ODF).
- **Outcomes of SBM Phase I**

- **Health Gains** – WHO estimated 300,000 fewer diarrheal deaths in 2019 versus 2014, linked to improved sanitation.
- **Economic Savings** – Households in ODF villages reduced health-related expenses by nearly INR 50,000 each year.
- **Environmental Protection** – ODF regions recorded notable declines in groundwater pollution levels.
- **Women’s Safety and Dignity** – With expanded toilet access, 93% of women expressed feeling safer within their homes.
- Building on these milestones, SBM (Gramin) Phase II focuses on sustaining ODF outcomes and advancing integrated solid and liquid waste management to achieve *‘Sampoorn Swachhata’*.
- **Phase II of SBM (Gramin)** – It was introduced in 2020 to guarantee universal access to household toilets and effective waste management, with the objective of transforming villages into ODF Plus Models.
- **Key objective** – To sustain the ODF status of villages and to improve the levels of cleanliness in rural areas through solid and liquid waste management activities.
- To make all villages ODF Plus Model, which includes ODF Sustainability, Solid and Liquid Waste Management, and Visual Cleanliness.
- **ODF Plus Village** – It is defined as a village which sustains its Open Defecation Free (ODF) Status, ensures solid and liquid waste management and is visually clean.
- **There are 3 progressive stages** of ODF Plus villages:
 - **ODF Plus Aspiring** – A Village which is sustaining its ODF status and has arrangements for Solid Waste Management OR Liquid Waste Management.
 - **ODF Plus Rising** – A village which is sustaining its ODF status and has arrangements for BOTH Solid Waste Management and Liquid Waste Management.
 - **ODF Plus Model** – A village which is sustaining its ODF status and has arrangements for both Solid Waste Management and Liquid Waste Management; observes visual cleanliness, and displays ODF Plus Information, Education & Communication (IEC) messages.
- India’s progress in sanitation under the Swachh Bharat Mission reflects a clear shift from access to sustainability.
- In rural areas, villages have steadily advanced from being declared open defecation free to achieving ODF Plus and ODF Plus Model status, showing strong community participation in maintaining facilities.

Rural Sanitation (SBM-Gramin)
● Over 95% of villages in India were declared ODF Plus.
● ODF Plus villages grew by 467% – from 1 lakh in December 2022 to 5.67 lakh villages.
● ODF Plus Model Villages increased to 4, 85,818.
Urban Sanitation (SBM-Urban)
● 4,692 cities are ODF, 4,314 have achieved ODF+, and 1,973 have reached ODF++ status.
● Individual Household Latrine: <ul style="list-style-type: none"> ○ Construction Achieved – 108.62% ○ Constructed – 63,74,355 ○ Mission Target – 58,99,637
● Community & Public Toilet: <ul style="list-style-type: none"> ○ Construction Achieved – 125.46% ○ Constructed – 6,38,826 ○ Mission Target – 5,07,587

India's Swachh Bharat Mission is often highlighted by the UN bodies such as UNICEF as one of the largest sanitation drives globally, showcasing how national action can contribute to global goals.

- Urban centers, meanwhile, have surpassed targets for household and public toilet construction, ensuring that sanitation infrastructure keeps pace with growing populations.
- **ODF Plus Plus** – It refers to an area where there is no open defecation and all toilets are functional and well-maintained, and all faecal sludge and sewage are safely managed and treated without being discharged into open drains or water bodies.
- **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)** – It was launched in 2015, focusing on the development of basic infrastructure in urban areas, in the sectors of water supply, sewerage, and septage management.
- **AMRUT 2.0** – It was launched in 2021 in all Urban Local Bodies (ULBs)/Cities.
- Providing universal coverage of sewerage and septage management in 500 AMRUT cities is one of the major focus areas of AMRUT 2.0.
- **Jal Jeevan Mission** – It was launched in August 2019, apart from providing safe and ample drinking water to all rural households, also focuses on sanitation & maintenance of open-defecation-free (ODF) villages.

What lies ahead?

- India's sanitation journey reflects a transformation from addressing open defecation to building sustainable systems of hygiene and waste management.
- Through initiatives like the Swachh Bharat Mission, AMRUT, and the Jal Jeevan Mission, the country has moved beyond infrastructure creation to ensuring dignity, inclusivity, and long-term cleanliness.
- With observance of important events like International Toilet Day, these efforts not only strengthen public health but also align with global commitments under Sustainable Development Goal 6, positioning India as a leader in advancing safe sanitation for all.

12. SECURITY

13.1 The Threat of Digital Tradecraft in Terrorism

Recently, a car explosion near Delhi's Red Fort on November 10, killing at least 15 people and injuring over 30, has revealed the use of advanced digital tradecraft in terrorist attacks.

What were the major findings of the investigation?

- **Encrypted communication** – The trio is alleged to have communicated via the Swiss messaging app Threema, a platform known for its high privacy design.
- Threema does not require a phone number or email to register, instead it assigns users a random user ID unlinked to any personal identifier.
- Investigators suspect that the three accused may have established their own private Threema server, creating a closed, isolated network through which they shared maps, layouts, documents, and instructions.

Threema's architecture is particularly useful to evade detection because it offers end-to-end encryption, no storage of metadata, and allows message deletion from both ends.

- The server may have been hosted either within India or abroad (investigations are ongoing as to its origin).
- These features make it extremely difficult for digital forensics teams to reconstruct full communication chains.
- **Sharing information using 'dead-drop emails'** – In what is being described as a classic "spy-style" technique, the suspects apparently used a shared email account (accessible to all module members) to communicate via unsent drafts.
- Instead of sending messages, they would save drafts; another member would log in, read or update them, and delete them – leaving no outgoing or incoming record on conventional mail logs.

- This method, sometimes referred to as a “dead drop,” is particularly insidious because it generates almost no digital footprint.
- **Reconnaissance and ammunition stockpiling** – As per interrogations and forensic data, the accused conducted multiple reconnaissance missions in Delhi before the attack.
- Investigators allege that ammonium nitrate, a powerful industrial explosive, was stockpiled, possibly via a red EcoSport vehicle that has now been seized.
- The use of a familiar vehicle, rather than something more suspicious, may have helped the module remain under the radar during logistics buildup.
- **Operational discipline and external linkages** – Sources suggest that Dr. Umar, who was reportedly the driver of the car that caused the blast, “switched off his phones” and cut digital ties after the arrest of his associates, a sophisticated tactic to limit exposure.
- Moreover, though investigations are ongoing, some sources suggest that the attack has links with the Jaish-e-Mohammed (JeM) or was following a JeM-inspired module.
- **The layered communication architecture** – Encrypted apps, dead-drop emails, coupled with infrequent but deliberate physical reconcess, suggests a cell that counts operational security among its highest priorities.

What are the implications?

- **Surveillance ineffectiveness** – As more terror modules adopt privacy-preserving technologies, traditional surveillance such as phone tapping, metadata collection, and email intercepts have become less effective.
- This should force law enforcement agencies to rethink investigative architectures.
- **Use of banned apps and proxies** – Threema is reportedly banned in India (*under Section 69A of the Information Technology Act, 2000*), yet the suspects seem to have continued using it via VPNs & foreign proxies.
- This suggests that bans alone may not stem the misuse of such apps, especially by sophisticated operators.
- Investigators need advanced capabilities such as being able to track private servers, reverse engineer encrypted networks, and apply memory forensics to trace such modules.
- Standard device seizures may not be sufficient without specialised technical expertise.
- **Potential of big network** – Moreover, if a link to external handlers (such as the JeM) is proved to be true, this attack may be part of a wider network.
- The level of planning and security discipline shown suggests not a lone cell, but a well-trained, possibly transnational, group.

What are some policy solutions?

- **Build a dedicated digital forensics teams** – There is a necessity to establish and expand teams skilled in encrypted-platform analysis, server forensics, and memory dumping to recover ephemeral data.
- The government should invest in units that specifically monitor misuse of E2EE platforms, anonymising services, and VPN exit nodes for potential terror tradecraft.
- **Regulation of self-hosted communication infrastructure** – The state needs to craft regulatory frameworks mandating private servers hosting communication platforms to comply with lawful access obligations, while balancing privacy rights.
- Cooperation with technology providers needs to be encouraged in order to enable lawful interception under strictly controlled, judicially-supervised processes.
- **Legal frameworks need to be enhanced** – Counter-terrorism laws need to be updated so that it explicitly addresses threats posed by encrypted, decentralised communication.
- Introduce or refine digital dead-drop detection mechanisms in investigations.
- Law enforcement should be trained to look for shared accounts, draft-only mailboxes, and similar tradecraft.
- **Prioritising community and institutional engagement** – The fact that the suspects were reportedly doctors from a university is deeply concerning; such institutions need support to detect radicalisation early.
- Counter-radicalisation programs tailored to highly educated recruits may be deployed.
- Modules operating in professional spaces (doctors, academics) are often less visible, but may wield more technical or ideological sophistication.

- **Strengthening International collaboration** – Given the possible transnational nature (encrypted apps, private servers, cross-border funding) of the attack, the state should deepen cooperation with foreign intelligence and law enforcement agencies.
- It should also encourage tech diplomacy, and engage with countries where encrypted-messaging apps like Threema are based to explore lawful but privacy-respecting access to self-hosted infrastructure linked to terror cases.
- There should also be public awareness about how modern terror cells operate.

What lies ahead?

- The Red Fort blast investigation illustrates how modern terrorist modules are evolving rapidly.
- They no longer rely solely on brute force or mass propaganda they are integrating advanced digital tradecraft with traditional radicalisation and operational planning.
- These developments resonate strongly with academic insights into extremist behaviour in the digital age.
- As violent actors become more technically adept, states too must adapt, not just by strengthening brute-force capacity, but by cultivating sophisticated, multidisciplinary intelligence, cyber-forensics, and legal tools.
- For India and democracies globally, this case is a sobering reminder that the next frontier in counter-terrorism is not just on the physical terrain, but also in encrypted, decentralised, and deeply private digital spaces.
- If we are to safeguard our cities and societies, we must meet this threat not only on the streets and borders, but also on servers and in code.

13.2 NIA – India's Significant Counter-Terror Architecture

Recently, The National Investigation Agency (NIA) on Wednesday arrested a man for allegedly harbouring and providing logistical support to Dr Umar Nabi, who drove the car that exploded outside the Red Fort Metro station in Delhi on November 10, killing at least 12 people and injuring several others.

How the NIA was created?

- **Establishment** – The aftermath of the 26/11 Mumbai terror attacks, led to the creation of the NIA.
- **Need** – It was created to address the critical need for a specialised agency capable of investigating complex, inter-state, and trans-national terror plots.
 - **Gap in security infrastructure** – The terrorist attack on Mumbai on 26 November 2008, which claimed the lives of 166 people, exposed gaping holes in India's security infrastructure.
 - **Lack of coordination** – State police forces and other central agencies were not able to effectively coordinate and investigate crimes with a transnational or inter-state terror dimension.
- **The NIA Act of 2008** – It was enacted immediately after the attack, established the NIA under the administrative control of the Ministry of Home Affairs (MHA).
- NIA acts as a specialised, central agency capable of investigating transnational and complex terror plots.
- **Major role** – The agency's primary function is to investigate and prosecute scheduled offences (mentioned in the NIA Act, 2008), which are serious crimes involving national security and those under the UAPA (Unlawful Activities Prevention Act, 1967).

How 2019 amendments strengthened NIA's authority?

- **Focus on broader networks of terrorism** – This includes the financial and logistical wings of terror networks, including organised criminal gangs, narco-terrorism and financing of terror activities, under its purview.
- **Specialised cells** – To tackle crimes emerging threats, the NIA has now established specialised cells such as:
 - The Terror Funding and Fake Currency (TFFC) Cell.
 - Anti-Cyber Terrorism Division (ACTD).
 - The Anti Human Trafficking Division (AHTD).
- **Jurisdiction & prior permission** – The agency *has jurisdiction over all states* and can take over the investigation of scheduled offences anywhere in India *without prior permission or consent from state governments*.

- This ensures operational efficiency and eliminates jurisdictional hurdles in inter-state and trans-state cases.
- **Special courts** – The cases investigated by NIA are tried by *NIA Special Courts*, ensuring a framework for a speedy trial on terrorism and national security-related offences.
- **The NIA (Amendment) Act, 2019** – It further expanded the agency's mandate and powers:
 - **Extra-territorial jurisdictions** – The NIA was now empowered to investigate scheduled offences committed outside India, provided they are directed against Indian citizens or affect Indian interests, subject to international treaties.
 - **Expanded list of scheduled offences** – The scope of the agency was expanded by adding human trafficking, counterfeiting of currency, manufacture and sale of prohibited arms, and cyber-terrorism to the list of scheduled offences.
 - **Designation of Special Courts** – The amendment empowered the centre and state governments to designate sessions courts as NIA special courts for the trial of scheduled offences in consultation with the Chief Justice of the High Court under which the sessions court falls.

What are the evolving mandate?

- **Conviction rate** – It has established a strong track record with a high *conviction rate of around 95%*, which bolsters public confidence and serves as a deterrent to terror outfits.
- **Repository & Information sharing** – This agency also acts as a repository of terrorism-related intelligence and *facilitates intelligence sharing and coordination between central and state agencies*.
- **Training programmes** – The NIA also conducts regular training programmes for police forces across India with a view to enhancing national counter-terrorism capabilities.
- **Disruption of terror groups** – It has been instrumental in apprehending several terror groups, disrupting various terror modules, and preventing some attempted attacks.
- **Dismantling financial networks** – The agency is also credited with cutting off key financial networks that support terror outfits and fuel terror operations that contributed to the unrest in Jammu and Kashmir.

What are the challenges?

- **Overreach of powers** – Although state governments can refer the cases pertaining to the scheduled offences for NIA investigation, the Central government may also, suo motu, direct the agency to take up/over the probe.
- This has, at times, raised concerns, especially because law and order is a state subject.
- **Heavy requirement of infrastructure** – As the agency's mandate expands, it will require more funding, recruitment, and specialised technical expertise, particularly for addressing domains such as cyberterrorism and counterfeiting.
- **Diplomatic barriers** – All actions of the NIA beyond Indian borders need to be carried out through diplomatic channels and in accordance with international treaties on legal assistance.

What needs to be done?

- **Permanent cadre** – The creation of a permanent cadre of specialised NIA officers rather than relying on officers deputed from the IPS and other police and services.
- **Intelligence sharing system** – The creation of a system of intelligence sharing between the NIA, the state Anti-Terror Squads (ATS), and police forces.
- This will lead to effective communication and avoid duplication of effort.
- **Increasing the investment** – Continuous and heavy investment in cutting-edge technology that keeps up with technological advancement, especially in view of the ever-evolving nature of crimes like cyber terrorism, narco-terrorism, and encrypted communication.
- This includes advanced forensic analysis and digital investigation tools that can match the sophistication of new terror modules.

What lies ahead?

- The NIA remains the cornerstone of India's counter-terror architecture.
- Its ability to adapt, evolve, and continually upgrade both human resources and technological capabilities will further strengthen its effectiveness in an increasingly complex national security landscape.
