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GEOGRAPHY, ENVIRONMENT & DISASTER MANAGEMENT

TOPICS FOR MAINS

Saving Earth's Frozen Reservoirs: The Urgency of Glacier Conservation

Syllabus Mapping: GS-1- Geography

Context

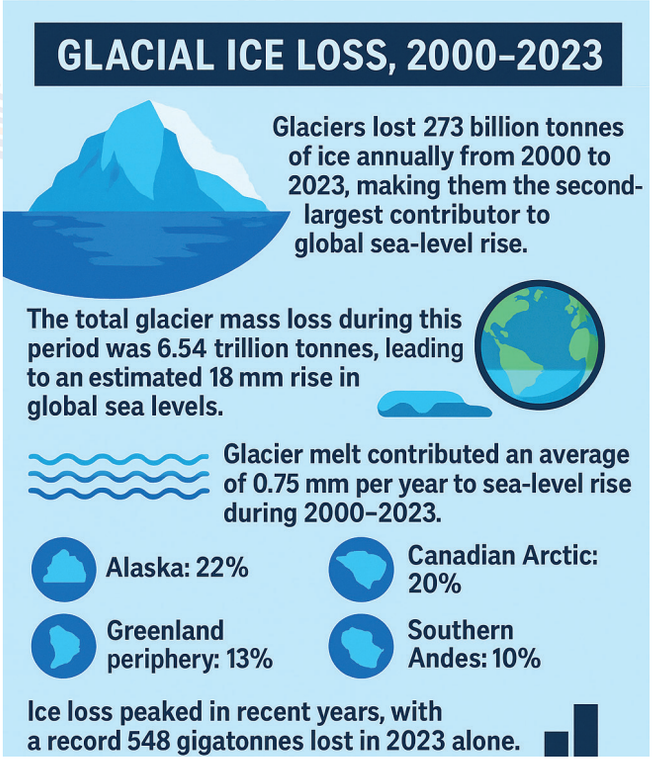
India reaffirmed its commitment to glacier reservation at the Plenary Session of the High-Level International Conference on Glaciers in Dushanbe, Tajikistan.

Significance of Glaciers

- **Freshwater Reservoirs:** Glaciers hold approximately 70% of the world's freshwater, making them the largest natural freshwater reservoirs.
  - E.g., In Asia, the Ganges River, fed by the Gangotri Glacier, supports nearly 400 million people through drinking water, agriculture, and hydropower.
- **Biodiversity Support:** Glacial ecosystems host unique cold-adapted flora and fauna, including microbial life that may hold medical or scientific value.
  - Their meltwater sustains wetlands and alpine meadows, supporting high-altitude biodiversity.
- **Natural Hazard Indicators:** Glacier behavior often forewarns natural hazards such as glacial lake outburst floods (GLOFs), avalanches, and landslides, helping in disaster risk reduction.
- **Climate Regulation:** Due to their high albedo (reflectivity), glaciers reflect significant sunlight, playing a vital role in global temperature regulation and climate moderation.
- **Economic Value:** Glaciers contribute significantly to eco-tourism.
  - E.g., glacier tourism in New Zealand contributes over USD $81 million annually, creating jobs and sustaining local communities.
- **Cultural and Spiritual Significance:** Many indigenous cultures revere glaciers.
  - E.g., At the Snow Star Festival in the Andes of Peru, glaciers are celebrated for their spiritual importance.

Multidimensional Impact of Melting of Glaciers

- **Climatic Impact**
  - **Acceleration of Global Warming:** Glacier loss reduces Earth's albedo effect, causing more solar radiation to be absorbed by land and oceans, thus intensifying global warming.
  - **Alteration of the Hydrological Cycle:** Excess freshwater from glacier melt changes precipitation patterns, disrupts monsoon behavior, and increases the variability of river flows.
  - **Influence on Weather Extremes:** Retreating glaciers impact regional climate systems, contributing to more frequent droughts, floods, and heatwaves in downstream regions.
- **Ecological Impact**
  - **Sea-Level Rise:** Melting glaciers are the second-largest contributor to rising sea levels after ocean warming, threatening coastal ecosystems and habitats.
  - **Glacial Lake Outburst Floods (GLOFs):** Glacier retreat leads to the formation of unstable moraine-dammed lakes, increasing the risk of catastrophic floods.
    - E.g., More than 15 million people globally are at high risk from GLOFs, with countries like India, Pakistan, Peru, and China facing the greatest dangers.



  - **Biodiversity Disruption in Mountain Ecosystems:** Cold-dependent alpine species face habitat loss as glacial environments shrink, leading to declining biodiversity in high-altitude zones.
- **Socio-Economic Impact**
  - **Water Insecurity:** Glaciers serve as natural water reservoirs. Their loss affects agriculture, drinking water, and hydropower for millions in glacier-fed basins like the Indus, Ganges, and Brahmaputra.
    - E.g., Himalayan glaciers may lose up to 75% of their mass if warming exceeds 3°C.
  - **Hydropower Disruption:** Reduced glacial runoff leads to lower electricity generation in countries relying on hydropower.
    - E.g., Peru faces an estimated US$ 740 million annual loss in the energy sector due to glacier retreat.
  - **Agricultural Vulnerability:** Erratic meltwater supply affects irrigation cycles, especially in pre-monsoon periods, heightening food insecurity.
  - **Livelihood Losses:** Communities dependent on glacier tourism, agriculture, and mountain resources face declining income and job displacement.
  - **Increased Disaster Risk and Infrastructure Damage:** GLOFs and landslides from retreating glaciers threaten villages, roads, dams, and hydropower infrastructure in mountainous regions.
- **Strategic and Geopolitical Impact**
  - **Border Tensions and Military Operations:** Glacial regions like Siachen are geopolitically sensitive. Glacier retreat affects border patrols, logistics, and troop deployment.
  - **Transboundary Water Disputes:** Shrinking glaciers feeding cross-border rivers can intensify water-sharing conflicts in regions like the Hindu Kush Himalayas (India, China, Pakistan, Nepal, Bhutan).

Initiatives Taken For Glacier Preservation

India's Initiatives

- **National Mission for Sustaining the Himalayan Ecosystem (NMSHE):** A vital component of India's National Action Plan on Climate Change (NAPCC), focusing on protecting the fragile Himalayan environment.
- **Centre for Cryosphere and Climate Change Studies:** Established to monitor glaciers and related changes in the Indian Himalayan Region.
- **Disaster Preparedness Measures:** Includes initiatives like mapping areas prone to Glacial Lake Outburst Floods (GLOFs) to reduce disaster risks.

Global Initiatives

- **International Year & Decade for Glaciers Preservation:** UNESCO and WMO have declared 2025 as the **International Year of Glaciers Preservation** and 2025–2034 as the **Decade of Action for Cryospheric Sciences**.
  - For the **1st time 'International Day of the Glacier'** was celebrated on **21st March 2025.**
- **Paris Agreement (2015):** Aims to limit global temperature rise to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels, to protect glaciers and climate systems.
- **International Centre for Integrated Mountain Development (ICIMOD):** A regional intergovernmental body working to conserve the Hindu Kush Himalaya (HKH) region and its cryosphere.

Way Forward

- **Aggressively Reduce Greenhouse Gas Emissions:** Limiting global warming to the Paris Agreement target of **1.5°C** is crucial.
- **Explore Innovative Geoengineering Solutions:** New engineering solutions are being developed to slow down glacier melt.
  - These include **underwater curtains** (to block warm ocean currents from reaching glaciers) and **albedo enhancement** (through the application of reflective materials like glass microspheres to glacier surfaces).
- **Implement Localized Adaptation and Ecosystem Restoration:** Communities are adopting innovative measures such as **Ice Stupas** in Ladakh, India, which are artificial glaciers that store winter water for dry seasons.
  - Additionally, **reforestation and ecosystem restoration** in glacial watersheds can stabilize local climates, slow ice loss, and enhance carbon sequestration.
- **Enhance Monitoring, Research, and Data Preservation:** Advanced technologies like **remote sensing** (satellite imagery and deep learning) are improving glacier mapping and change detection.
  - Projects like the **Ice Memory initiative** are vital for archiving ice cores from endangered glaciers, preserving invaluable climate records for future scientific research.
- **Strengthen Global Policy and International Collaboration:** Advocate for and participate in international efforts that prioritize glacier preservation (initiatives such as the **International Year of Glaciers' Preservation (2025).**

A Deep Dive into India's Cotton Textile Industry

Syllabus Mapping: GS-1- Geography

Context

The Indian Government has taken several initiatives to make India a preferred cotton supplier for global brands.

Current Status

- India's cotton production for 2023–24 reached 5.50 million Metric Tonnes (MMT), making it the second largest producer in the world after China.
- India's cotton consumption is currently 5.39 MMT, ranking it as the second largest consumer globally.
- India holds the first place in cotton acreage, with 124.69 lakh hectares under cultivation, which represents 39% of the world's total area of 318.8 lakh hectares.
- India ranks 33rd in productivity, with a yield of 441 kg per hectare.
- This industry sustains the livelihood of an estimated 6 million cotton farmers and between 40 to 50 million people engaged in related activities such as cotton processing and trade.
- Due to its economic importance in India, cotton is also termed **"White-Gold."**

Factors Determining Location

- **Raw Material:** Cotton is a pure raw material that does not lose weight after processing, meaning it can be imported from other regions for use in the textile industry where other industrial infrastructure already exists.
- **Electricity:** A mechanized industry requires a cheap and consistent supply of electricity.
- **Skilled Labor:** The industry requires low-cost, skilled labor, benefiting from high population density in countries like China, Japan, and India.
- **Demand and Market:** The industry flourishes with local and international demand, and it remains stable even in non-cotton growing areas.
- **Other Considerations:** These include a humid climate, good transportation, and the availability of chemicals, dyes, and machinery.

Distribution of Cotton Textile Industry in India

- **1900-1920**
  - Bombay was the main focal point of all development in the cotton textile industry.
  - Other centers included Ahmadabad, Surat, Kalyan, Thane, Vadodara, Bharuch, and Pune.
  - With increase in demand, there was two-directional dispersion:
    - North Direction – Delhiàdue to cheap raw materials from Malwa plateau region, cheap labor and north-Indian market.
    - Eastern diffusion-Telangana and Deccan lava Plateau areaàexpanded up to Nagpur in the east and Hyderabad in the South East
  - Industry also reached some places with additional advantages such as:
    - Nagpur – due to the nearness of coal mines
    - Kanpur – due to excellent financial facilities
    - Kolkata – due to proximity from port and market.
- **Post-Independence**
  - The industry made rapid progress in Punjab, Haryana, West UP, and Delhi.
  - The Hooghly region in West Bengal emerged as a major region
  - **Southward diffusion** – Coimbatore, Madurai, and Tirunelveli were major centers of diffusion due to:
    - Development of Hydroelectricity e.g., the Pykara project.
    - Readiness of industrialists to take advantage of amicable conditions for the Cotton Industry.
    - Raw cotton farming in the Madurai-Coimbatore region
    - Market availability.
- **Present Status**
  - Maharashtra is the leading producer of cotton textiles in IndiaàMumbai called "Cottonpolis of India"; Gujarat the second-largest producer of cotton textiles→ Ahmedabad is called 'Manchester of India & Boston of East'.

State	Major Centers
Maharashtra	Mumbai, Sholapur, Kolhapur, Pune, Jalgaon, Akola, Sangali, Nagpur, Satara, Wardha, Aurangabad, and Amravati
Gujarat	Ahmedabad, Surat, Vadodara, Bharuch, Bhavnagar, Nadiad, Porbandar, Rajkot, Navsari, mauri and Viramgam

State	Major Centers
Tamil Nadu	Chennai, Tirunelveli, Madurai, Tuticorin, Salem, Virudhunagar, and Pollachi
Uttar Pradesh	Kanpur, Etawah, Modinagar, Moradabad, Bareilly, Hatras, Agra, Meerut, and Varanasi
Karnataka	Bangalore, Belgaum, Mangalore, Chitradurga, Gulbarga and Mysore
Madhya Pradesh	Indore, Gwalior, Mandasaur, Dewas, Ujjain, Nagda, Bhopal, Jabalpur, and Ratlam
Rajasthan	Kota, Jaipur, Sri Ganganagar, Bhilwara, Bhavanimandi, Udaipur, and Kishangunj
West Bengal	Kolkata, Howrah, Serampore, Shyamanagar, Saikia, Murshidabad, Hugli and Panihar

Government Initiatives

- **Samarth (Scheme For Capacity Building In Textile Sector):** It aims to provide industry-aligned NSQF-compliant training across textile sectors (except spinning and weaving) to enhance employment opportunities.
- **Amended Technology Up-gradation Fund Scheme (ATUFS):** It aims to provide credit linked Capital Investment Subsidy (CIS) to units for purchase of benchmarked machinery in a different segment of Textile Sectors (excluding spinning).
- **National Technical Textile Mission:** It comprises four components, namely, Research, Innovation and Development; Promotion and Market Development; Export Promotion; Education, Training, Skill Development.
- **PLI Scheme for Textile**s: It aims to promote the production of MMF apparel, MMF Fabrics, and Products of Technical Textiles
- **PM-MITRA:** It aims to attract investment for the 'Make In India' initiative and to boost employment generation through setting up of 7 (Seven) PM Mega Integrated Textile Region and Apparel (PM MITRA) Parks in Greenfield/Brownfield sites.

- **Mission for Cotton Productivity**: It is a five-year initiative announced in the Union Budget 2025-26, aiming to significantly improve cotton yield and quality, especially extra-long staple cotton varieties.
  - Target: to increase productivity from 439 to 612 kg/hectare by 2030.
- **Kasturi Cotton Bharat programme** of the Ministry of Textiles focuses on branding Indian cotton.
- **2025 India-UK FTA:** It eliminates tariffs on nearly all Indian textile and apparel exports to the UK, making Indian products more price-competitive than those from non-FTA countries like China, Vietnam, and Bangladesh.

Challenges faced by India's Cotton Textile Industry

- **Increasing Raw Material Costs:** The industry faces ongoing pressure from the rising costs of raw materials, directly affecting production expenses and profitability.
- **Competition from Synthetic Fabrics:** There is intense competition from synthetic fabrics, which often offer cost advantages or specific performance characteristics that appeal to consumers.
- **Suboptimal Labor Productivity:** A significant issue is the lower labor productivity compared to global standards, potentially hindering efficiency and overall output.
- **Shrinking Export Markets:** The industry is observing declining export markets due to evolving consumer behavior and heightened international competition, making it harder to maintain global market share.
- **Prevalence of Obsolete Machinery:** A major concern is the widespread use of obsolete machinery, with only an estimated 18-20% of mills being automated, leading to inefficiencies and higher production costs.
- **Existence of Sick Mills:** Many sick mills persist within the industry, primarily due to factors such as outdated machinery, high operational costs, or inefficient management, which impacts overall industry health.
- **Infrastructural Deficiencies:** The sector is also burdened by infrastructural issues, including an erratic power supply, which can disrupt production schedules and increase operational challenges.

Way Forward

- **Enhance Cotton Productivity through R&D** to develop high-yielding, pest-resistant, and climate-resilient cotton varieties, aiming to bridge the yield gap with global leaders like Brazil and the USA.
- **Strengthen Domestic Textile Value Chains** by developing textile and garment clusters.
- **Improve Logistics and Export Infrastructure** by investing in modern ginning, warehousing, and port facilities to lower post-harvest losses.
- **Leverage Trade Agreements and Build Market Access** to expand export opportunities, particularly in emerging and ASEAN markets.
- **Encourage Sustainable Cotton Initiatives** like the Better Cotton Initiative (BCI) and organic cotton cultivation to meet the rising global demand for eco-friendly textiles.

Ocean Conservation: Safeguarding the Blue Lifeline of the Planet

Syllabus Mapping: GS-3- Environment

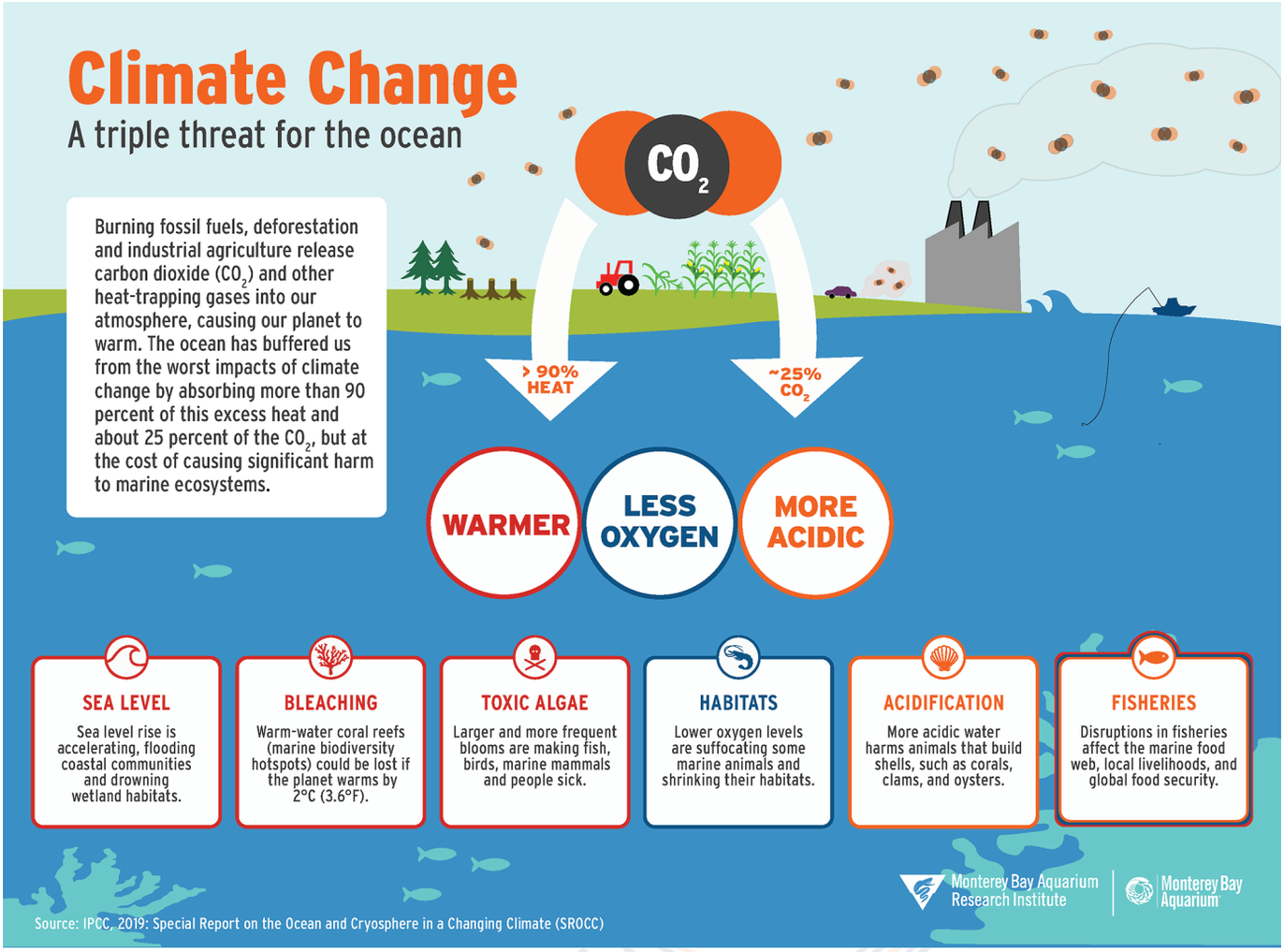
Context

The 2025 UN Ocean Conference (UNOC3) was held in Nice, France

Importance of Oceans

- **Climate Regulation:**
  - Oceans absorb 25% of anthropogenic CO_2 emissions and over 90% of excess heat, acting as a global heat buffer. E.g., The Southern Ocean alone absorbs about 40% of global oceanic CO_2 uptake (NASA, 2020).
  - Ocean currents act like a global conveyor belt, distributing heat from the equator towards the poles and cold water back to the tropics.
  - Oceans influence monsoons, El Niño, La Niña events that affect global agriculture and rainfall patterns.
- **Biodiversity Hotspot:** Oceans host over 2.2 million species, including coral reefs, which support 25% of marine life.
  - E.g., The Great Barrier Reef is the world's largest coral ecosystem.
- **Oxygen Production**: Marine phytoplankton contribute 50–80% of global oxygen, making oceans central to breathable atmosphere.
- **Livelihood & Economic Resource:** Over 3 billion people rely on oceans for livelihoods, especially in fisheries, tourism, and trade.
  - E.g., The global "blue economy" is valued at over $2.5 trillion annually (OECD).

- **Food Security:** Oceans provide over 17% of global animal protein, especially vital for developing countries.
- **Disaster Risk Reduction:** Coral reefs and mangroves act as natural barriers against cyclones and tsunamis.
- **Geostrategic Significance:** Over 90% of global trade is carried by sea, and maritime boundaries influence geopolitical and economic strategies.



Impact of Climate Change on Oceans

- **Rising Sea Surface Temperatures (SSTs):** Global SSTs have increased by 0.13°C per decade since 1901.
- **Ocean Acidification**: Oceans have absorbed about 30% of emitted CO_2, lowering pH and harming calcifying organisms like corals and shellfish.
- **Sea-Level Rise:** The global sea level has risen by 20 cm since 1900, with an accelerating trend of 3.7 mm/year (WMO 2023).
  - E.g., Threat to island nations like Maldives, Kiribati, and coastal Indian cities like Mumbai and Chennai.
- **Loss of Marine Biodiversity:** Climate-induced coral bleaching, shifting habitats, and oxygen-depleted zones threaten marine ecosystems.
  - E.g., Over 30% of coral reefs have been lost globally (UNEP 2020).
- **Disruption of Ocean Currents:** Warming affects the Atlantic Meridional Overturning Circulation (AMOC), which regulates climate in Europe and Africa.

Other Major Threats to Ocean Health

- **Plastic Pollution**: Over **5 trillion plastic pieces** float in oceans (National Geographic).
- **Oil Spills and Shipping Accidents**: Pose acute toxic threats to marine ecosystems.
- **Overfishing & IUU Fishing**: Illegal, unreported, and unregulated fishing leads to resource depletion.
- **Eutrophication**: Agricultural runoff causes algal blooms and dead zones, e.g., in the Gulf of Mexico.
- **Deep-sea Mining**: Emerging threat to fragile ocean floor ecosystems.

Global Measures for Ocean Conservation

- **United Nations Convention on the Law of the Sea (UNCLOS):** Adopted in 1982, it provides a comprehensive legal framework governing all ocean space, including navigation, territorial rights, resource exploitation, and environmental protection.
  - It mandates the protection of marine biodiversity and equitable use of ocean resources, especially in Exclusive Economic Zones (EEZs) and high seas.
- **Sustainable Development Goal (SDG) 14 – Life Below Water:** SDG 14 aims to "conserve and sustainably use the oceans, seas and marine resources for sustainable development."
- **High Seas Treaty (2023)**
  - Also known as the Biodiversity Beyond National Jurisdiction (BBNJ) Treaty, it is a landmark international agreement adopted under UNCLOS in 2023.
  - It aims to ensure conservation and equitable benefit-sharing of marine genetic resources in the two-thirds of ocean areas beyond national jurisdiction.
- **UN Decade of Ocean Science for Sustainable Development (2021–2030):** It fosters global collaboration among scientists, governments, and stakeholders to support evidence-based ocean policy and sustainable use.
- **Convention on Biological Diversity (CBD):** Under theKunming-Montreal Global Biodiversity Framework adopted at CBD COP15 (2022), countries committed to protect 30% of the world's oceans and land areas by 2030.
- The 30x30 target emphasizes marine protected areas, sustainable fisheries, and restoration of degraded marine ecosystems.

The UN Ocean Conference

Key Takeaways from 2025 UN Ocean Conference (UNOC3)

- **The Nice Ocean Action Plan:** It is a comprehensive framework focusing on accelerating ocean conservation and sustainable use
- **Launch of the Ocean Investment Protocol:** UNEP FI and the UN Global Compact introduced the Ocean Investment Protocol at the Blue Economy and Finance Forum.
  - It guides financial institutions in aligning investments with Sustainable Development Goal 14 (Life Below Water), promoting sustainable ocean economies.
- **Introduction of One Ocean Finance Mechanism:** It is a public-private development finance mechanism, launched to mobilize substantial funding for sustainable blue economies.
  - It aims to unlock capital from ocean-dependent industries, supporting industry transitions, ocean health restoration, and coastal community resilience.
- **Progress on the BBNJ Agreement:** The Agreement on Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ) saw 19 new ratifications, totaling 50 of the 60 needed for it to become law.
- **Development of Marine Biodiversity Credits:** Marine biodiversity credits were presented as a new financial mechanism, allowing private sector investment in ocean conservation through measurable biodiversity gains.
- **Financial Commitments:** Despite a substantial funding gap, several financial commitments were announced:
  - The European Investment Bank and Asian Development Bank pledged €3 billion to combat ocean plastic pollution by 2030.
  - Development Bank of Latin America and the Caribbean committed $2.5 billion for sustainable marine investments from 2025 to 2030.
  - Swen Capital Partners raised €160 million for its SWEN Blue Ocean 2 fund, targeting €300 million to support ocean biodiversity-focused start-ups.
- **Coral Reef Bond:** Indonesia introduced the world's first coral reef bond, linking investor returns to conservation success, specifically improvements in coral reef fish biomass.
  - This bond, potentially worth up to $150 million, covers 1.9 million hectares of coral ecosystems.

Measures taken by India

- **The Wild Life Protection Act of India (1972)** provides legal protection to many marine animals. There are a total of 31 major Marine Protected Areas in India covering coastal areas that have been notified under Wildlife Protection Act, 1972.
- **The National Committee on mangroves, wetlands and coral reefs** constituted in 1993 advise the Government on relevant policies and programmes regarding marine species.
- **The Coastal Regulation Zone (CRZ) notification (1991 and later versions)** prohibit developmental activities and disposal of wastes in the fragile coastal ecosystems.
- **Deep Ocean Mission** is being implemented by the Ministry of Earth Sciences with six thematic areas, which includes development of Ocean Climate Change Advisory Services to address climate resilience, exploration and conservation of deep-sea biodiversity, development of technologies for harnessing ocean resources and capacity building.

- **India-Norway Marine Pollution Initiative (2019):** Joint collaboration to combat plastic and microplastic pollution in marine ecosystems.
- India is actively developing **ocean ecosystem accounts** as part of its broader environmental accounting efforts, focusing on the extent, condition, and value of marine ecosystems.

India has proposed the following six strategic interventions 2025 UN Ocean Conference (UNOC3)

- Advancing Marine Research and Science-Based Ocean Governance
- Expanding Marine Protected Areas and Supporting the BBNJ Agreement
- Reducing Marine Pollution through Wastewater Management and Circular Economy
- Enhancing Coastal Resilience through Ocean-Based Climate Solutions
- Promoting Ocean Renewable Energy and Indigenous Knowledge
- Integrating Coastal Communities into Inclusive Ocean Governance

Challenges in Ocean Conservation

- **Lack of Legally Binding Global Frameworks**: Most international ocean agreements, including outcomes from UN Ocean Conferences, result in voluntary commitments without enforceable compliance mechanisms, limiting effective action.
- **Inadequate Governmental Action and Accountability**: Reports such as those by OceanCare reveal a persistent gap between commitments and actual implementation, with many governments failing to translate pledges into policies or measurable outcomes.
- **Fragmented Global Governance Structure**: Multiple agencies and overlapping jurisdictions (e.g., IMO, UNEP, regional fisheries bodies) lead to poor coordination, duplication of efforts, and inconsistent enforcement across regions.
- **Insufficient Integration of Ocean Issues into National Policy:** Ocean conservation often remains sidelined in national development agendas, with weak inter-ministerial coordination (e.g., between environment, fisheries, and industry ministries).
- **Lack of Financial and Technical Capacity:** Many developing countries face resource constraints, hindering surveillance, research, enforcement, and capacity-building for effective marine governance.

Suggested Measures

- **Establish Legally Binding Global Frameworks**: Move beyond voluntary pledges by creating enforceable international agreements with compliance mechanisms, clear targets, and penalties for non-compliance.
- **Strengthen National Ocean Governance Mechanisms:** Create dedicated marine regulatory bodies or inter-ministerial coordination platforms to integrate ocean issues across sectors like environment, fisheries, trade, and infrastructure.
- **Enhance Monitoring, Reporting, and Accountability:** Develop robust MRV systems (Monitoring, Reporting, and Verification) to track progress on conservation targets and ensure transparent evaluation of commitments.
- **Mobilize Sustainable Blue Finance:** Increase investment in ocean health through blue bonds, public-private partnerships, and targeted international funding for conservation, technology, and capacity building.
- **Build Capacity in Developing and Coastal Nations:** Provide technical support, training, and data-sharing platforms to enhance local capacities for surveillance, enforcement, marine research, and community engagement.

Supreme Court bars ex-post facto environmental clearance

Syllabus Mapping: GS-Paper 3, Environment, EIA

Context

The Supreme Court in Vanshakti vs Union of India judgement held that 2017 notification & 2021 Order of Ministry of Environment, Forest & Climate Change (MOEFCC) paving way for ex-post facto or retrospective environment clearance as illegal.

SC's rationale for barring ex-post facto Environment Clearance

- Ex-post facto environment clearance regularises the illegality done by project proponents by commencing the construction or commencing the project without prior environment clearance.
- EIA notification was first issued in September 2006, thus, project proponents are fully aware of the stringent provisions of EIA, 2006 rules.
- Ex-post facto clearance will dilute the need for project proponents to take EIA clearances and cause irreparable damage to the environment.
- According to the Environment Protection Act, 1986, even after payment of penalty on the basis of polluter pays principle for violation of EIA, the project will not be regularised. The project will have to be stopped and demolished.

- Violation of Article 21 (Right to Life), Article 14 (Right to Equality), Fundamental duties and DPSP of the constitution, all of which cast duty on state, individuals to protect the environment.

About Environment Impact Assessment (EIA)

Convention on Biological Diversity "Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse."

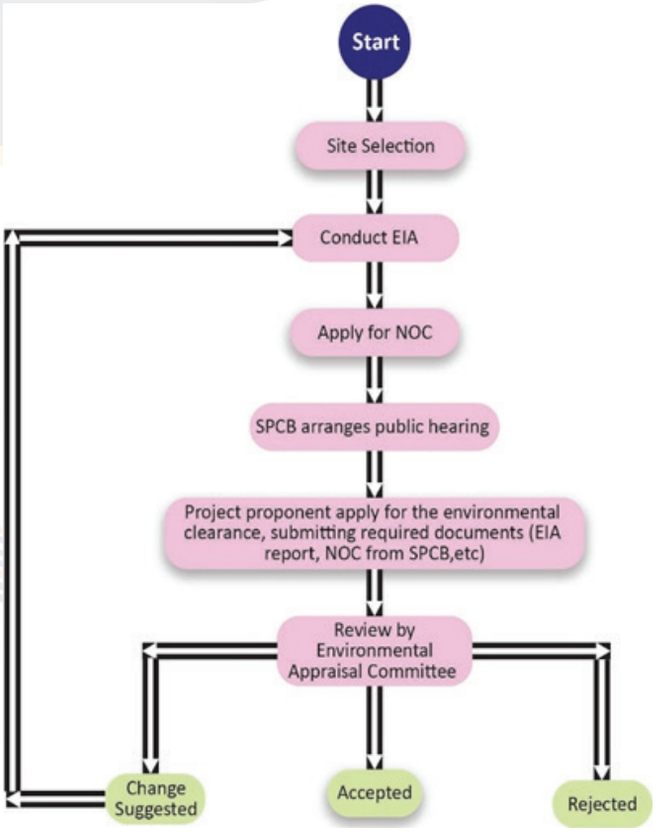
Evolution of EIA in India

- **1976:** The establishment of the Environmental Planning and Coordination Organization (EPCO)
- **1994:** The Ministry of Environment, Forest and Climate Change (MoEFCC) introduced the first comprehensive EIA notification, known as the Environmental Impact Assessment Notification, in 1994→established a regulatory framework for conducting EIAs for various projects.
- **2006:** The EIA notification underwent amendments to strengthen the EIA process. It introduced provisions for public participation, expanded the scope of project categories requiring clearance, and enhanced scrutiny procedures.
- **2022:** The Ministry of Environment, Forest, and Climate Change introduced new changes to the clearance process for development projects.

EIA Notification 2006: Key Features

In India, EIA was formally launched as a mandatory environmental management tool introduced under the Environment Protection Act, 1986.

- **Project Categorization:** Projects are classified as Category A (cleared by MoEFCC) and Category B (cleared by SEIAA/SEAC).
- Category B is subdivided into B1 (EIA required) and B2 (EIA not required).
- **Screening and Scoping:** Projects are screened based on size and impact to determine category. Scoping defines key environmental issues and boundaries for the EIA study.
- **EIA Study and Report:** A detailed EIA report includes baseline data, impact assessment, alternatives, and an Environmental Management Plan (EMP) for mitigation.
- **Public Consultation:** Mandatory public hearings ensure community input, transparency, and stakeholder engagement in the decision-making process.
- **Expert Appraisal Committees (EACs):** Central and state-level EACs, comprising experts, review EIA reports and recommend project approval or rejection.
- **Environment Appraisal Committee:** Environmental Clearance is granted or denied by MoEFCC or SEIAA based on EAC recommendations, with conditions for environmental safeguards and monitoring.
- **Post-clearance Monitoring**: Project proponents must submit regular compliance reports to ensure environmental norms are followed during implementation.



- **Public Access to Information:** EIA documents, clearances, and monitoring data are made publicly available to promote transparency and accountability

In 2022, the Ministry of Environment, Forest and Climate Change introduced a number of changes to the environmental clearance process for development projects.

Projects which have got exemptions from environmental clearance:

- Highway projects of strategic and defense importance, which are 100 km from the Line of Control.
- Thermal power plants up to 15 MW based on biomass or non-hazardous municipal solid waste using auxiliary fuel such as coal, lignite, or petroleum products up to 15 percent
- Increasing the threshold of ports that exclusively deals in fish handling, and caters to small fishermen

- Toll plazas that need more width for installation of toll collection booths to cater to a large number of vehicles.

Changes in Validity of Environmental Clearances

Project	New Tenure of Validity for Environment Clearance
River Valley Project	13 years
Nuclear Power Projects	15 years
Mining	30 years
Projects other than mining and River Valley	10 years

Significance of EIA

- **Balancing economic development with environment: E.g.,** EIA process for the POSCO steel plant in Odisha helped balance industrial development with ecological concerns by recommending the relocation of the project site to avoid damage to forest and coastal ecosystems.
- **Accomplishing long-term growth:** E.g., Industrial projects with EIA compliance integrate eco-friendly practices, reducing future environmental costs.
- **Reduced environmental damage:** E.g., Highway projects may include wildlife corridors and noise barriers to protect biodiversity and human health.
- **Addressing issues of affected individuals:** E.g., In dam projects, local communities can raise issues related to displacement and livelihood loss.
- **Preventing natural calamities:** E.g., For landslide-prone areas, EIA may advise slope stabilization before approving construction.
- **Builds Stakeholder Trust:** E.g., Projects with strong EIA participation face less public resistance and enjoy smoother implementation.
- **Minimizing judicial disputes:** E.g., Mining projects with EIA-mandated water protection measures are less likely to face court challenges.

Challenges with EIA in India

- **Lack of Public Awareness:** E.g., In several rural dam and mining projects, locals often remain unaware of their rights under EIA provisions (CSE Report, 2021).
- **Issues with EIA studies:**
  - Conflict of interest of Environment consultants: EIA studies are conducted by consultants onboarded by the project proponents, since project proponents want the project to sail through, EIA consultants often give favourable reports overlooking environmental concerns.
  - Lack of access to baseline data: Access to good quality environmental data of a region is essential to hazard the impact a particular project will have. However, this data is not standardised and easily available.
  - Ignoring Cumulative Impacts: EIAs focus on isolated projects and often neglect the combined ecological impacts of multiple developments in a region. E.g., In industrial zones like Korba (Chhattisgarh), cumulative pollution from multiple thermal plants is inadequately addressed.
- **Language Barriers:** EIA reports are typically available only in English or official languages. E.g., In tribal belts of Odisha and Chhattisgarh, stakeholders often cannot engage
- **Corruption and Lack of Transparency:** Instances of biased reporting, fraudulent public hearings, and compromised expert appraisals E.g., The CAG has flagged irregularities in several EIA clearances across states.
- **Regulatory Loopholes:** Vague screening criteria and project exemptions allow large developers to bypass proper scrutiny or downgrade project categories.
- **Shortage of Trained Professionals:** E.g., Poorly researched EIA reports have been flagged in projects like the Etalin Hydroelectric Project.
- **Weak Public Participation Mechanisms:** E.g., In several mining projects in Jharkhand and Andhra Pradesh, public hearings lasted less than an hour with poor attendance.
- **Poor Monitoring and Enforcement**: E.g., A study by the Centre for Science and Environment (2020) showed that less than 35% of cleared projects are regularly monitored.
- **Attitude towards EIA:** Often governments and project proponents see EIA as an obstruction in the economic development of the country. This leads to a mere tokenistic approach to EIA with both government and project proponents collaborating to bypass the provisions and overlooking nature's interest.

Suggested Measures to Strengthen EIA

- Enhance public involvement and awareness
- Translate EIA documents into local languages for better accessibility.
- Promote transparent practices by ensuring the disclosure of relevant project informationàEncourage independent audits and public scrutiny to prevent corruption and irregularities.
- Review and revise existing EIA notifications to address gaps and exemptions, establishing a more rigorous and standardized assessment process.
- Consider the cumulative impacts of multiple projects within a region to assess their combined environmental effects.
- Invest in training programs and capacity-building initiatives for EIA professionals, including experts in environmental science, engineering, and social sciences.
- Develop robust systems for regular data collection, monitoring, and reporting.
- Impose stringent penalties for non-compliance to deter violations and encourage responsible project implementation.
- Regularly review the EIA framework to incorporate emerging best practices, scientific advancements, and lessons learned from previous experiences.

TOPICS FOR PRELIMS (GEOGRAPHY)

Phytoplanktons

Context

According to a new study, iron released due to human activities enhances spring phytoplankton blooms as well as speeds up the rate at which nutrients are consumed.

About Phytoplanktons

- Derived from the Greek words phyto (plant) and plankton (made to wander or drift), phytoplankton are microscopic organisms that live in watery environments, both salty and fresh.
- They are similar to terrestrial plants in that they contain chlorophyll and require sunlight in order to live and grow.
- Some phytoplankton are bacteria, some are protists, and most are single-celled plants.
- Among the common kinds are cyanobacteria, silica-encased diatoms, dinoflagellates, green algae, and chalk-coated coccolithophores.
- **Habitat**: They float near the ocean surface where sunlight can reach.
- **Nutrient Requirements**:They need inorganic nutrients like nitrates, phosphates, and sulfur to synthesize proteins, fats, and carbohydrates.
- **Types of Phytoplankton:**
  - **Dinoflagellates**: Move using whip-like tails called flagella.
    - Have complex protective shells.
  - **Diatoms**: Possess rigid, interlocking shells made of a different material (silica).
    - Do not have flagella; drift with ocean currents.
- **Ecological Role:**
  - Serve as a **primary food source** for marine animals like shrimp, snails, and jellyfish.
  - Help sustain **balanced marine ecosystems**.
- **Harmful Algal Blooms (HABs):** Occur when excess nutrients cause uncontrolled phytoplankton growth.
  - Can release **toxic substances** harmful to fish, shellfish, birds, mammals, and humans.

Causes of Volcanism

Context

Recently Mount Etna in Italy erupted.

Why do Volcanoes Erupt?

- **Heating of the Earth's Interior:** Magma is formed due to the melting of rocks in the earth's lithosphere. The rocks melt in the lithosphere due to intense heat.
  - This **heat inside the earth comes from two sources**:
    - Heat leftover from the collisions of large and small particles that created Earth
    - Heat generated by **radioactive decay** (disintegration of radioactive materials present within the earth).
- **Plate Tectonics:**
  - **Convergence/Subduction:**
    - When the heavier oceanic plate subducts under the lighter continental plate, due to collision, the oceanic plate further sinks into the mantle.
    - Under high temperature and pressure, the rocks melt and this molten rock or the magma is lighter than the surrounding rocks and thus rises up.
    - This **magma collects in the magma chamber deep down below the surface** and on enough accumulation, it finds its way up to the surface through vents causing violent eruptions.
  - **Divergence:**
    - Volcanoes erupt along the cracks on the ocean floor, causing the magma to rise.
    - Magma reaches the surface to become lava, which then cools down and solidifies to form a new crust along the edges of the cracks.
- **Steam Formation:**
  - As water percolates through the ground, it may meet the hot magma beneath the surface that creates steam, which gets collected in the rock structure.
    - Due to immense pressure, the steam along with molten materials gushes out with an explosion.

Recent Examples of Volcanic Eruption

- **Mount Etna**, Italy – Frequent eruptions (2021, 2023).
- **La Palma**, Canary Islands (Spain) – Major eruption in 2021, causing evacuations.
- **Hunga Tonga**, Tonga – Massive undersea eruption in Jan 2022, caused tsunamis across the Pacific.
- **Mount Semeru**, Indonesia – Erupted multiple times (2021–2023), deadly pyroclastic flows.

Mirage

Context

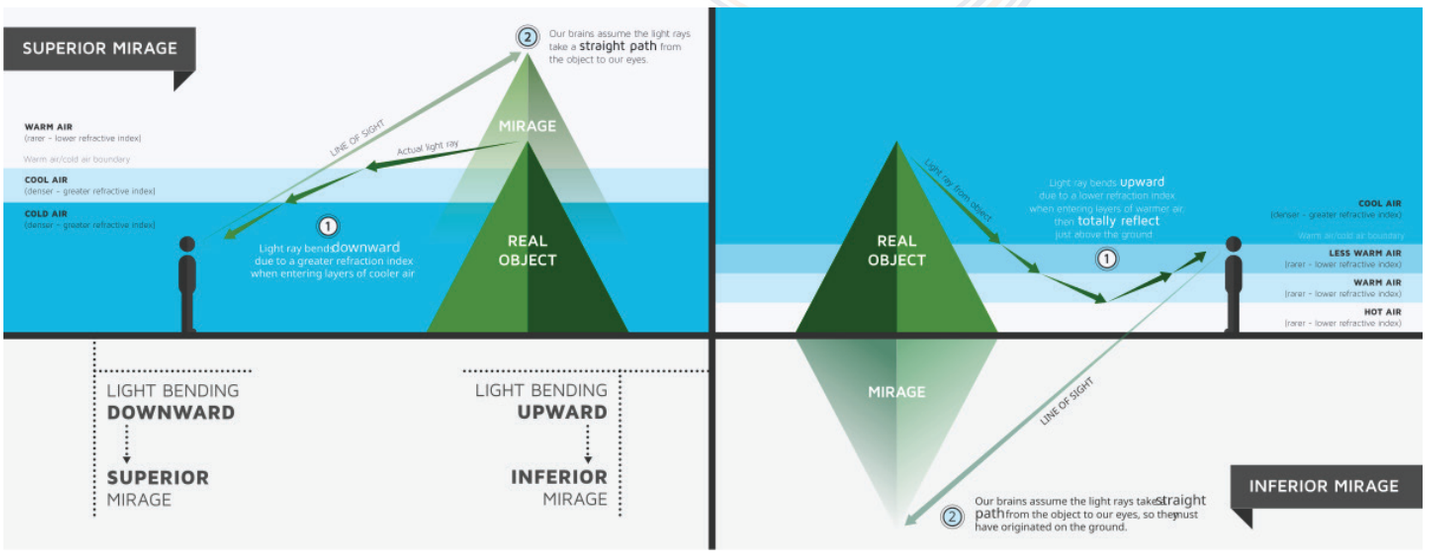
A mirage was seen on Kartavya Path in New Delhi due to intense heat and humidity.

About Mirage

- A **mirage** is an **optical illusion** caused by the **refraction (bending) of light rays** as they pass through layers of air at **different temperatures**.
- It is not a physical object, but rather an image that appears displaced from its actual position.

Scientific Principle Behind a Mirage

- **Refraction**: Light travels at different speeds in hot and cold air. When it passes through layers of air with varying temperatures, it bends.
- On **hot days**, the ground heats the air just above it, making it **much hotter than the cooler air** above.
- This creates a **temperature gradient**, or what scientists call a **thermal inversion**.



How Mirage Happens on Hot Roads?

- The sun heats the **asphalt road**, which in turn heats the **air just above** it.
- Light coming from the **sky** bends **upward** as it passes through this gradient of hot and cool air.

- To the human eye, this bent light appears to be **coming from the ground**.
- The brain interprets this as a **reflection**—making the road **look wet**, as if there's water ahead.
- This is called an **inferior mirage**, the most common type seen on roads or deserts.

Types of Mirages

Type	Description	Example
Inferior Mirage	Image appears below the actual object	"Water" on road
Superior mirage	Image appears above the actual object, due to cold air below and warm air above (temperature inversion)	Ships floating in the sky
Fata Morgana	A complex and distorted mirage seen in polar regions or over oceans; can stack images or distort them dramatically	Ship castles, cliffs appearing in mid-air

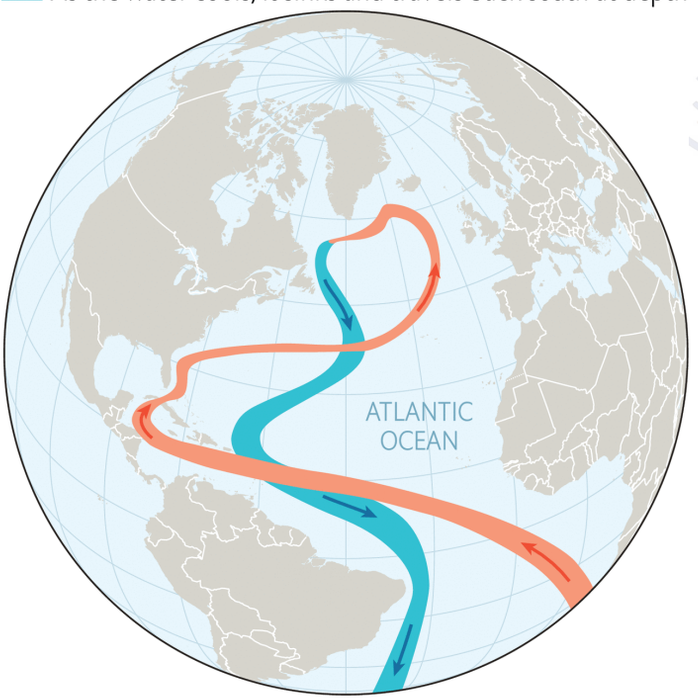
Atlantic Meridional Overturning Circulation (AMOC)

Context

According to new research, the collapse of a key Atlantic Ocean current system could plunge winter temperatures across northern Europe to unprecedented lows.

Atlantic meridional overturning circulation

Warm water travels northwards close to the surface
As the water cools, it sinks and travels back south at depth



Sources: Potsdam Institute for Climate Impact Research; Met Office

The Economist

About Atlantic Meridional Overturning Circulation (AMOC)

- The Atlantic Meridional Overturning Circulation (AMOC) is an ocean current system that transports warm surface waters from the tropics towards the northern Atlantic and colder deep waters that are part of the thermohaline circulation, southward.
- **Mechanism**
  - The Atlantic Ocean warm water cools as it travels north, and the evaporation raises its salt content.
  - The cool water sinks deep into the ocean because of its increased density that is brought on by a combination of a low temperature and a high salt content.
  - The difference in the salinity and temperature between the water forces the stream to run deep below steadily.
  - Eventually the water returns to the surface after it warms up, thus, completing the circulation.
- **Significance**
  - AMOC helps to dissipate heat and energy throughout the earth and maintain the heat budget.
  - AMOC plays an important role in decreasing the severity of the winters in Western Europe (Gulf of Stream, North Atlantic Drift)
  - The AMOC serves as a carbon sink by absorbing and storing carbon from the atmosphere.
  - The distribution of heat in the polar regions is largely dependent on thermohaline circulation.

Nickel

Context

The study, published in Nature bypassed the traditional multistep process to extract nickel and developed a single metallurgical step conducted in one furnace.

About Nickel

- It is a hard, silvery-white metal. Pentlandite (a mixture of nickel, iron, and Sulphur) is nickel ore.
- It is very hard and resistant to erosion.
- It is also very ductile and malleable.
- **Uses**
  - Used to safeguard other metals by plating them.
  - Used in batteries. E.g., rechargeable nickel-cadmium batteries and nickel-metal
  - hydride batteries in hybrid automobiles.
  - Used in coinage. The five-cent piece (known as a "nickel") in the United States comprises 25% nickel and 75% copper.
  - Used as a catalyst to hydrogenate vegetable oils.
  - Plants, animals and fungi need nickel for functioning of Enzyme Urease. E.g. Fungus Cryptococcus Neofarmans use Urease to spread and colonise

Distribution of Nickel

Indonesia (Largest Producer)	Sulawesi, Celebes
Philippines	Rio Tuba
Australia	Queensland and Kalgoorlie
Canada	Sudbury, Lynn Lake
CIS	Sverdlovsk and Orsk in the Urals, Kola Peninsula, Norilsk in Siberia.
India	Sukinda valley in Jajpur district, Odisha→deposits of nickel in the form of limonite. Jharkhand's East Singhbhum district→ nickel is found as a sulphide, along with copper.

Bauxite

Context

Medha Patkar and activists were stopped by Odisha Police while heading to Rayagada for a World Environment Day meeting on bauxite mining.

About Bauxite

- It is a **sedimentary rock** with a relatively **high aluminium content.**
- **Appearance**: Reddish-brown, gray, or yellow,
- **Mainly found in**: Tropical and subtropical regions
- **Usage**: Its ore is important for the production of aluminum metal.
  - Approximately 90% of the world's bauxite is processed to produce alumina (aluminum oxide).

The Bayer process

- It is a major method for **refining bauxite to obtain alumina.**
- **Alumina** is then refined into **pure aluminum** metal through the **Hall–Héroult electrolytic process**.

The largest bauxite producing countries

2024 and 2030 bauxite production estimates
Unit: million tonnes

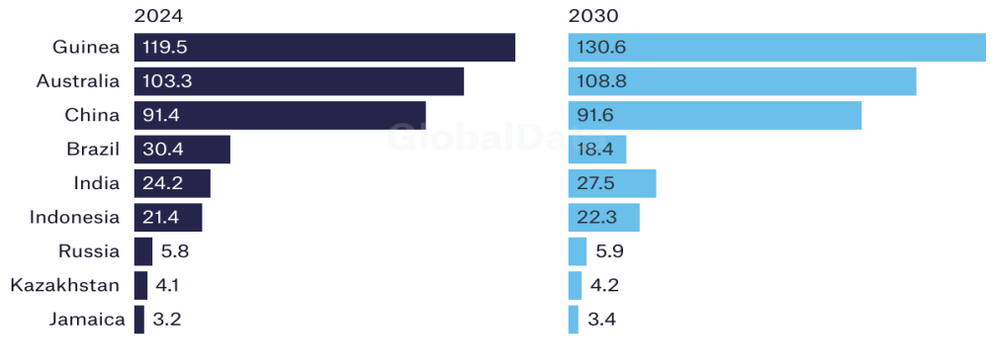


Chart: Smruthi Nadig • Source: GlobalData, Australia's Department of Industry, Science and Resources

Major Bauxite Mines and Reserves

India:

- **Odisha** (including Rayagada, where bauxite mining controversies have occurred).
- Andhra Pradesh, Gujarat, and Jharkhand.

Global Reserves:

- **Guinea**: Leading the world in bauxite reserves and production.
- **Australia**: Second largest producer of bauxite.
- **China**: Heavily reliant on bauxite for its large aluminum industry
- **Brazil**: Significant bauxite reserves in the Amazon basin.

Rare Earth Elements (REEs)

Context

India is working to bolster its domestic mining and refining capabilities of REEs.

Rare Earth Element Present Applications

Element	Present Applications
Yttrium	Phosphors, ceramics, metal alloys
Lanthanum	Batteries, catalysts for petroleum refining
Cerium	Auto catalysts, Chemical Catalyst, glass polishing, metal alloys
Praseodymium	High power magnets, yellow ceramic pigment
Neodymium	High power magnets
Promethium	Beta radiation source
Samarium	High temperature magnets
Europium	Fluorescent lighting
Gadolinium	Magnetic resonanceimaging contrast agent, nuclear reactor rods
Terbium	Phosphors for lighting, high power high-temperature magnets
Dysprosium	High power hig-temperature magnets,
Holmium	Lasers
Erbium	Ceramic magnetic materials, which are still under development
Thulium	Fibre optic technology, solar panels
Ytterbium	PET scanners
Lutetium	PET scanners

About REEs

- They are a group of 17 chemically similar metallic elements in the periodic table.
- They are rare because they are found in low concentrations and mixed with other minerals.
- Thulium and lutetium are the two rare earth elements with the lowest abundance.
- Cerium, yttrium, lanthanum, and neodymium are the most plentiful rare earth elements.
- **Characteristics:** High density, high melting point, high conductivity, and high thermal conductance.
  - Do not occur in a free state. They are found in mineral oxide ores.
- **Usage:**
  - **Electronics:** In smartphones (neodymium), laptops, flat-panel displays, and headphones.
  - **Clean Energy (such as dysprosium, yttrium, and cerium):** In wind turbines, electric vehicles (EVs), and solar panels.
  - **Defence Sector**: Used in precision-guided missiles, radar systems, sonar, and jet engines.
  - **Medical Technology:** Enable advanced imaging tools in radiation-based cancer treatments, such as MRI and PET scanners.
  - **Industrial Use:** Petroleum refining, high-grade glass polishing, and production of strong, corrosion-resistant metal alloys.
- **Distribution:**
  - **China** produces roughly **60% of the world's supply** and processes almost 90%.
    - Other major producers are **Myanmar, Australia, USA, Russia and Malaysia.**
  - **India** is **almost 100% import dependent** for most rare earths, although it holds around 6% of the world's rare earth reserves.
    - Major rare earth minerals found in India include ilmenite, sillimanite, garnet, zircon, monazite, and rutile.
    - These minerals are collectively known as Beach Sand Minerals (BSM).
    - Found along parts of the Tamil Nadu, Andhra Pradesh, and Orissa coasts.
    - The Rare Earth Division of Indian Rare Earths Ltd. (under the Department of Atomic Energy) and Kerala Minerals and Metals Ltd. (KMML) are the two government-owned REE producers.
    - Titanium is mainly extracted from ilmenite ore (82%), with other sources being slags (13%) and rutile ore (5%).
    - Ilmenite and rutile are the principal titanium-bearing ore minerals, with potential economic importance for other minerals such as anatase, perovskite, and titanomagnetite in the future.

Length of India's coastline along states

State/UT	Coastline length (in km)
Gujarat	2,340.62
Maharashtra	877.97
Goa	193.95
Karnataka	343.3
Kerala	600.15
Tamil Nadu	1,068.69
Andhra Pradesh	1,053.07
Odisha	574.71
West Bengal	721.02
Daman and Diu	54.38
Pondicherry	42.65
Lakshadweep	144.8
Andaman and Nicobar	3,083.50

Source: Ministry of Ports, Shipping and Waterways

India's Revised Coastline and Island Count

Context

The coastline of India has increased by 3,582 km, or nearly 48 per cent after accurate measurements without any acquisition of territory.

Increase in Coastline Length

- India's coastline has been reassessed to be 11,098 km, an increase of 3,582 km (or nearly 48%) from the earlier estimate of 7,516 km.
- **Reasons for increase**
  - The earlier coastline measurement (1970s) used low-resolution data (1:4,500,000), missing finer details and offshore islands.
  - The updated measurement, using high-resolution data (1:250,000) and GIS tools, captures intricate curves and irregularities, leading to a significant increase in total length.

Offshore and inshore islands in states

State/UT	Offshore islands	Inshore islands	Total
Gujarat	108	36	144
Maharashtra	105	15	120
Goa	39	2	41
Karnataka	88	12	100
Kerala	7	--	7
Tamil Nadu	26	2	28
Andhra Pradesh	20	12	32
Odisha	13	3	16
West Bengal	14	9	23
Daman and Diu	9	--	9
Lakshadweep	33	--	33
Andaman and Nicobar Islands	836	--	836
Total	1,298	91	1,389

Source: Office of Surveyor General of India

Increase in the Number of Islands

- Island count is not a measurement problem but one of classification and definition.
- In 2016, the Surveyor General listed 1,382 offshore islands, but other agencies counted 1,334→Some ambiguities persist—certain locations are islands only during high tide.
- After data reconciliation, the standardised count is now:
  - 1,298 offshore islands
  - 91 inshore islands
  - Total: 1,389 islands
- Note: River islands (e.g., in Assam or West Bengal) are not included in this count.

Implications of New Data

- **Administrative and Developmental**
  - Better mapping of the coastline can enhance coastal zone planning.
  - Can influence the Coastal Regulation Zone (CRZ) norms in specific areas.
  - May lead to more accurate allocation of resources and developmental funding.
- **Environmental and Disaster Management**
  - Informs coastal erosion control strategies and climate adaptation plans.
  - Supports disaster preparedness, especially in vulnerable coastal and island zones.
- **Security and Strategic Planning**
  - Improves maritime surveillance and island administration.
  - Supports planning for the Indian Navy, Coast Guard, and other security agencies.

  - Reinforces India's blue economy and strategic positioning in the Indo-Pacific.
- **Tourism and Infrastructure**
  - Updated maps can aid in responsible tourism development.
  - Facilitates better planning of ports, shipping routes, and coastal infrastructure.

The Coastline Paradox: Why Length Keeps Changing?

- Coastlines are fractal in nature—their length depends on the scale of measurement.
- The finer the scale, the longer the coastline appears.
- Known as the "Coastline Paradox", this applies to other features like riverbanks and mountain ranges.
- Hence, India has mandated a coastline reassessment every 10 years.

TOPICS FOR PRELIMS (ENVIRONMENT & DISASTER MANAGEMENT)

Draft Notification for Emissions Intensity Targets for High-Emitters (MoEFCC, April 2024)

Context

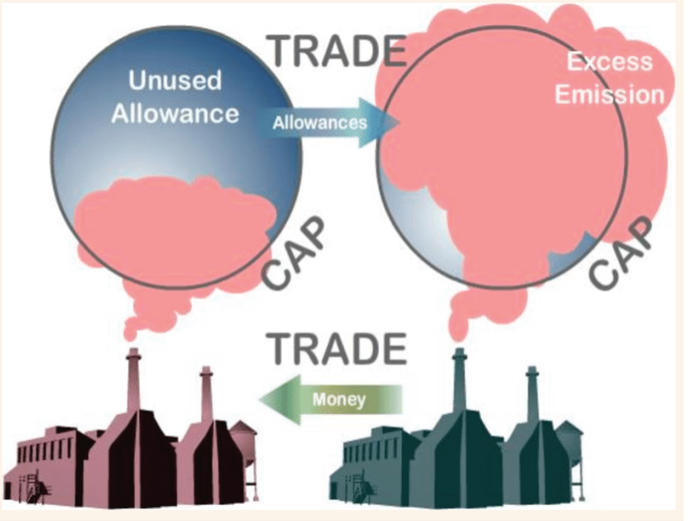
The Ministry of Environment, Forests and Climate Change (MoEFCC) has released a draft notification setting emissions intensity targets for high-emitters.

Key Provisions of the Draft Notification for Emissions Intensity Targets for High-Emitters (MoEFCC, April 2024)

- **Objectives:** Fulfil India's **Nationally Determined Contributions (NDCs)**.
  - Promote **sustainable and cutting-edge technologies** in high-emission sectors.
- **Introduction of a Compliance-Based Carbon Market:** India is set to launch its **first mandatory carbon market in 2026**.
  - The draft notification lays the foundation for this cap-and-trade system.
- **Emissions Intensity Targets:** Targets are based on **emissions per unit of economic output** (intensity-based, not absolute).
  - Aims to reduce **GHG emissions intensity by 45% by 2030** from 2005 levels.
- **Scope of Coverage: 282 industrial units** are mandated under this scheme.
  - Sectors included:
    - **Cement** (largest share – 186 units)
    - **Aluminium**
    - **Chlor-alkali**
    - **Pulp and paper**
  - **Power sector excluded**, despite being the **largest emitter (39.2%)**.
- **Baseline Emission Calculation:** A baseline is created for each industrial unit based on:
  - **Direct energy emissions**
  - **Process emissions**
  - **Indirect emissions**
  - Covers **CO_2 and perfluorocarbons (PFCs)**.
- **Monitoring & Governance: Bureau of Energy Efficiency (BEE)** will administer the compliance market.
  - Validation and verification will be done by **third-party agencies**.
  - Oversight by **NSCICM (National Steering Committee for Indian Carbon Market)** ensures integrity.

Cap and Trade System

- It is a market-based approach to pollution control where a limit, or "cap," is set on the total amount of pollutants that can be emitted.
- Companies are then allocated permits to pollute, and these permits can be traded, allowing them to buy and sell the right to emit.



Green India Mission

Context

The Ministry of Environment, Forest and Climate Change (MoEFCC) released the revised Green India Mission (GIM) plan for 2021–2030 on June 17, 2025, coinciding with the World Day to Combat Desertification and Drought.

About Green India Mission

- National Mission for a Green India (GIM) is one of the eight Missions outlined under the National Action Plan on Climate Change.
- It aims at protecting, restoring, and enhancing India's forest cover and responding to Climate Change by undertaking eco-restoration activities in the forest and non-forest areas in the selected landscapes.

Comparison: GIM 2014 vs Revised GIM (2021–2030)

Vision & Objectives

Aspect	GIM 2014	Revised GIM 2021–2030
Vision	Protect, restore, and enhance forest cover; respond to climate change	Same vision, but aligned with **India's NDCs under the Paris Agreement**
Focus	General forest cover improvement	**Targeted approach**: Aravallis, Western Ghats, Himalayas, Mangroves, Arid Northwest

Targets

GIM 2014	Revised GIM Plan
Afforestation on 5 million ha of non-forest land	**24–25 million ha** afforestation/ restoration (via GIM + convergence)
Improve forest quality on 5 million ha	GIM will directly **treat 1 million ha** by 2030
Annual CO_2 sequestration target: **50–60 million tonnes**	Projected **carbon sink**: up to **3.39 billion tonnes CO_2**

Sub-Missions / Components

GIM 2014 – 5 Components	Revised GIM Plan – 3 Components
1. Forest cover improvement	1. Forest quality & ecosystem services
2. Ecosystem restoration	2. Afforestation & ecosystem restoration
3. Urban greening	3. Livelihood enhancement for forest-dependent communities
4. Agro/social forestry	
5. Wetland restoration	

Monitoring & Evaluation

GIM 2014	Revised GIM Plan
Ground-level surveys	**5-tier monitoring system**
Remote sensing via Forest Survey of India	National-level GIS-based cell + Dashboard
Planned social audits	Self-monitoring by agencies + **Gram Sabha audits**
	Satellite-based monitoring (FSI + expert bodies)
	Third-party evaluations for transparency

Sustainable Development Report (SDR)

Context

The Sustainable Development Report 10th edition was released.

About Sustainable Development Report (SDR) 2025

- **What it is**: The world's most authoritative annual ranking of progress toward the **Sustainable Development Goals (SDGs)** for **193 UN member states**.
- **Released by**: **UN Sustainable Development Solutions Network (SDSN)**.
- **Focus of 2025 Edition**:
  - **Financing SDGs by 2030**.
  - **Reforming the Global Financial Architecture (GFA)** to address development inequality.
- **Top 3 Countries**:
  - Finland
  - Sweden
  - Denmark

Key Highlights of SDR 2025

- **Strong Global Commitment**: **190 of 193** UN member states submitted **Voluntary National Reviews (VNRs)**—a sign of high political engagement.
- **Regional Leaders**: **East and South Asia** showed the **fastest progress** since 2015, thanks to economic growth and targeted policy reforms.
- **Top Improvers in Score**: **Benin** (+14.5), **Nepal** (+11.1), **UAE** (+9.9), **Peru** (+8.7)
- **European Dominance**: **19 of the top 20** SDG performers are from Europe, highlighting their investment in welfare, education, and green energy.
- **Global Lag**: None of the 17 SDGs are **fully on track** globally.
  - Only **17% of SDG targets** are currently progressing.
- **Multilateralism Index**: **Barbados** ranked 1st in commitment to UN-led multilateralism.
  - **USA** ranked last (193rd), due to recent withdrawals from key global treaties.
- **Fiscal Space Gap**: Nearly **50% of countries** lack the financial capacity to implement SDG-linked welfare programs.
- **Global Financial Inequality**: The current **Global Financial Architecture (GFA)** disproportionately favors **wealthy nations**, depriving **EMDEs** (Emerging Markets and Developing Economies) of capital.

India's Performance in SDR 2025

- **Rank**: **99th place** – India enters the **Top 100 for the first time** in SDR history.
- **Score**: Shows **steady improvement**, especially in digital access and social services.
- **Regional Comparison**:
  - **China**: 49th
  - **India**: 99th
  - **Bangladesh**: 114th
  - **Pakistan**: 140th
- **Progress Areas**:
  - **SDG 3 (Healthcare)**
  - **SDG 7 (Electricity Access)**
  - **SDG 9 (Digital Infrastructure)**

- **Key Challenges**:
  - **SDG 2**: Rising obesity
  - **SDG 13**: Weak climate action
  - **SDG 16**: Press freedom and institutional transparency

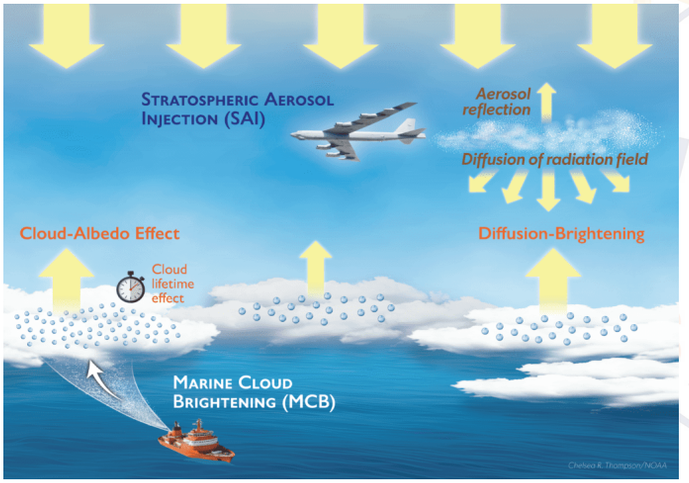
Key Global Challenges to SDG Progress

- **Geopolitical Conflicts:** Wars and unrest disrupt SDG implementation, especially in fragile states.
- **Limited Fiscal Capacity:** Debt and low revenue limit the ability to invest in health, education, and green tech.
- **Climate Crisis:** Climate change worsens inequality, food insecurity, and biodiversity loss.
- **Unfair Financial Systems**: GFA continues to benefit richer countries while EMDEs face capital shortages.
- **Institutional Weaknesses:** Poor governance and lack of data hinder evidence-based SDG planning.

Stratospheric aerosol injection (SAI)

Context

A new study has made the controversial idea of stratospheric aerosol injection (SAI)—**a method to cool the Earth by spraying reflective particles into the upper atmosphere.**



About Stratospheric Aerosol Injection (SAI)

- SAI aims to cool the planet and reduce climate change impacts by adding tiny reflective particles to the upper atmosphere.
- The method is based on volcanic eruptions, which have a cooling effect by releasing aerosols into the air.
- **Effectiveness by Altitude**:
  - **Higher altitude injection** is more effective as particles remain in the atmosphere longer.
  - **Lower altitude injection** is technically easier but less effective since particles can be washed out by rain or trapped in clouds.
- Injecting **12 million tonnes of sulphur dioxide** annually at 13 km altitude could cool the planet by **0.6°C**.

Aerosols

- **Definition**: Aerosols are tiny solid or liquid particles suspended in air or gas.
- **Sources**:
  - **Natural**: Fog, volcanic gases, sea spray, dust.
  - **Artificial**: Smoke from burning fossil fuels, industrial emissions.
- **Types**:
  - **Primary aerosols**: Emitted directly into the atmosphere (e.g., dust, soot).
  - **Secondary aerosols**: Formed in the atmosphere from precursor gases (e.g., sulfur dioxide).
- **Composition**: Made up of various **inorganic and organic substances**.
- **Size Range**:
  - True aerosol particles range from a few millimicrometres to about **1 micrometre** (10^{-4} cm) in diameter.
  - **Aitken nuclei**: Particles smaller than 0.1 micrometre.
- **Visible Forms**: Includes **smoke, smog, haze, and dust plumes** commonly seen in polluted or dusty environments.

International Big Cat Alliance (IBCA)

Context

The first Assembly of the International Big Cat Alliance (IBCA) was held in New Delhi presided over by the Union Minister for Environment, Forests and Climate Change, Bhupender Yadav.

About International Big Cat Alliance (IBCA)

- It is a multi-country, multi-agency coalition of countries with an interest in big cat conservation.
- Launched by the **Government of India** in **March 2024**.
- Established through the **National Tiger Conservation Authority (NTCA)**.
- Functions under the **Ministry of Environment, Forest and Climate Change**.
- **Membership**: Membership is open to **97 "range" countries**, which host the natural habitat of these big cats, as well as other **interested nations, international organizations**, etc.
- **Objectives:**
  - Global Conservation of **7 big cats – Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar and Puma.**
    - **India hosts five of these:** Tiger, Lion, Leopard, Snow Leopard and Cheetah (excluding Jaguar and Puma).
  - Prevent Illegal Wildlife Trade by strengthening anti-poaching laws and enforcement.
  - Financial & Technical Support for conservation efforts in range and non-range countries.
- It is the **First-ever global alliance** for big cat conservation.
- The alliance has received ratifications from **India, Nicaragua, Eswatini, Somalia and Liberia.**

Exposomics for better environmental health

Context

World Environment Day 2025 focuses on ending plastic pollution. In India, environmental exposures are rising due to rapid development, demanding integrated health strategies like exposomics to reduce the environmental disease burden effectively.

What is the Exposome?

The **exposome** refers to the **total lifetime environmental exposures** an individual experiences — including **chemical, physical, biological, psychosocial, and dietary factors** — and their interactions with internal biology (genes, metabolism, epigenetics) that influence disease development.

Environmental Disease Burden

- **Major Contributor to Global Mortality:** In 2021, environmental and occupational risks caused **12.8 million global deaths** (18.9%) and accounted for **14.4% of all DALYs**.
- **Leading Risk Factors Globally:**
  - **Ambient PM2.5 air pollution**: 4.7 million deaths
  - **Household air pollution (solid fuels)**: 3.1 million deaths
- **India's High Burden: ~3 million deaths** and **100 million DALYs** in India due to OEH risks.
  - Contributes to over **50%** of the burden of non-communicable diseases like heart disease, diabetes, and lung disorders.
  - **Lead exposure** alone caused up to **154 million IQ points lost** globally among children under 5, with India contributing 20%.
- **Gaps in Current Estimates:** Covers only 11 categories of risks.
  - Excludes emerging threats like **microplastics**, **chemical mixtures**, **noise**, and **climate change impacts**.
  - Fails to capture complex interactions among multiple risk factors over a lifetime.

India follows globally accepted scientific frameworks, primarily the **Global Burden of Disease (GBD) methodology – Developed by WHO** in 2000, to estimate its **disease burden**.

GBD Methodology

- It is a **comprehensive worldwide research program** led by the **Institute for Health Metrics and Evaluation (IHME)** that systematically measures:
  - **Mortality and morbidity** from major diseases, injuries, and risk factors.
  - Across **age groups**, **sex**, **countries**, and **time**.

Key Features

- Uses **DALY** (Disability-Adjusted Life Year) = **YLL (Years of Life Lost)** + **YLD (Years Lived with Disability)**
- Identifies **top causes of death and disability** globally and nationally.
- Helps **governments and organizations** prioritize health policies and interventions.

How Exposomics Is a Solution for Environmental Disease Burden

- **Captures Lifetime and Cumulative Exposures:** Traditional studies focus on single or limited exposures.
  - **Exposomics maps all exposures** — chemical, physical, biological, and psychosocial — **across the entire lifespan**, offering a more complete health risk profile.
- **Reveals Complex Interactions:** Many environmental factors act synergistically (e.g., air pollution + poor diet + stress),
  - Exposomics helps detect how these exposures interact with genetics, lifestyle, and metabolism, leading to diseases like asthma, cancer, and diabetes.
- **Enables Precision Prevention:** By identifying personal exposure signatures, it allows for tailored public health interventions and early disease prediction, especially for non-communicable diseases (NCDs).
- **Incorporates Emerging Hazards:** Current Global Burden of Disease (GBD) estimates exclude microplastics, endocrine disruptors, noise pollution, etc.
  - Exposomics includes novel and combined exposures to better estimate actual risks.
- **Drives Innovation in Surveillance:** Uses **wearables**, **biosensors**, and **AI-based data integration** to monitor real-time exposure.
  - Helps build **long-term environmental health surveillance systems** for policymaking.
- **Fosters Data-Driven Policy:** Generates high-resolution exposure data that supports **evidence-based environmental regulations**, **urban planning**, and **public health strategies**.

Biocontrol Agents As A Solution For Invasive Species

Context

Apart from mechanical and chemical control methods to tackle invasive plant species, scientists also employ classical biocontrol agents such as fungi.

About Invasive Alien Species

- According to the **Convention on Biological Diversity (CBD)**, invasive species are **introduced outside their natural distribution that threaten biodiversity.**
  - **Characteristics**: **Ability to arrive, survive, and thrive in new environments** by reproducing quickly and outcompeting native species for resources.
- **In India:** Under the amended **Wildlife Protection Act, 1972 (2022)**, they are defined as non-native species whose introduction or spread could negatively impact native wildlife or habitats in India.
  - However, this definition does not cover species that are invasive only in certain regions within India, such as the chital in the Andamans.

- **Examples of Invasive Species in India:**
  - **Fauna:**
    - **Fish**: African catfish, Nile tilapia, red-bellied piranha, and alligator gar.
    - **Turtles**: Red-eared slider, which is a common exotic pet that competes with local species for food and habitat.
    - **Chital**: Introduced by the British in the early 20th century, have no natural predators on the islands and have become an invasive species, spreading across the **Andaman archipelago**.
  - **Flora:**
    - **Mikania micrantha** (also called **"mile-a-minute weed"**) — native to Central and South America but introduced multiple times to India — is now a major invasive plant affecting biodiversity and crops.

Impacts of Invasive Species

- **Ecological Damage:** Displace or eliminate native flora and fauna
  - Threaten endangered species (**e.g.,** Manas Wildlife Sanctuary's grasslands impacted by Mikania)
- **Economic Losses:** Lower agricultural and plantation yields (**e.g.,** tea, teak, rubber)
  - Costly to manage and control.
- **Biodiversity Threats:** Lead to extinction of endemic species
  - Disrupt ecological balance (**e.g.,** Indian mongoose introduced to control rats ended up harming local wildlife)
- **Public Health Concerns:** Some invasive plants cause allergies and skin irritation (**e.g.,** Parthenium).

Control Measures for Invasive Species

- **Mechanical Control: Manual weeding, uprooting, burning**
  - Effective but **labour-intensive** and **temporary**
  - Mikania grows several cm/day — difficult to match by manual removal.
- **Chemical Control:** Use of **herbicides and pesticides**
  - Often **environmentally harmful** and **costly**
  - Effects may not be long-lasting
- **Classical Biological Control: Introduction of natural enemies** (insects, fungi, pathogens) from native habitats
  - **Puccinia spegazzinii** fungus used against **Mikania micrantha**
  - **Zygogramma bicolorata** beetle used against **Parthenium hysterophorus**
  - **Weevil Cyrtobagous salviniae** for **Salvinia molesta**
- **Policy and Regulatory Measures:** Strengthening **quarantine laws** and **biosecurity**
  - Timely **approval of biocontrol agents**
  - Raising awareness among farmers and stakeholders
- **Research and Monitoring:** Continuous ecological research to identify suitable biocontrol agents
  - E.g., Climate suitability studies, as climate change may affect efficacy.

Limitations of Biological Control Agents

- **Host Specificity Required**: Must target only the invasive species to avoid harming native flora/fauna.
- **Time-Consuming Process**: Requires years of research, testing, and regulatory approval.
- **Ecological Risks**: Potential to become invasive themselves or disrupt local ecosystems.
- **Climate Sensitivity**: Effectiveness can reduce under unsuitable temperature or humidity conditions.
- **Slow Results**: Impact may take months or years to be visible, unlike chemical methods.
- **Limited Scope**: Less effective against fast-moving or generalist invasive species (e.g., certain fish or insects).

Coalition for Disaster Resilient Infrastructure (CDRI)

Context

Recently, the 7th edition of the International Conference on Disaster Resilient Infrastructure (ICDRI) was held in Nice, France.

About CDRI

- **Purpose**: Aims to **strengthen the resilience of infrastructure systems** to climate change and disaster risks.
- **Launched in**: **2019** during the **United Nations Climate Action Summit** in **New York**.
- **Headquarters**: New Delhi, India.
- **Partnership**: Comprises **46 countries** and **8 international partner organizations**.
  - Includes national governments, international agencies, and the private sector
- **Funding**: Supported through **voluntary contributions** from member countries and organizations.
- **Major Donors**: India (host country), **USA**, **UK**, **Australia**, **France**, **Germany**, **Japan**, **Canada**, and the **World Bank**.
- **Key Focus Areas:**
  - Small Island Developing States (SIDS)
  - Urban Resilience
  - Data and Early Warning Systems
  - Finance and Governance
  - Critical and Social Infrastructure
  - Mountain Ecosystems
  - Africa-Focused Projects
  - Resilience for Major Events
  - Research and Innovation
  - Capacity Building and Training
- **Governance Structure**
  - **Governing Council**: Includes all members; meets **once a year**.

- **Executive Committee**: Oversees programs and projects; meets **twice a year**.
- **Secretariat**: Led by a **Director General**; manages day-to-day operations.

Bonn Climate Change Conference

Context

The annual Bonn Climate Change Conference began in Bonn, Germany.

About Bonn Climate Change Conference

- It is an **annual mid-year meeting** organized under the **United Nations Framework Convention on Climate Change (UNFCCC)**.
  - Acts as a key platform to **advance climate negotiations** before the annual COP (Conference of the Parties).
- **Launched**: 1992
  - Formally called the **Sessions of the UNFCCC Subsidiary Bodies (SBs)**.
- **Purpose**: To discuss the **technical and scientific aspects** of climate action.
  - Helps in **setting the agenda** for the COP summit, held typically in **November**.
  - Also reviews the **implementation of agreements** made at the previous COP.
- **Attendees:** Members of the Subsidiary Bodies (SBs), Indigenous peoples' representatives, scientists, civil society, and international organizations.
- **Key Agenda for 2025: Global Goal on Adaptation (GGA),** which is an attempt to identify a common global goal on adaptation, just like keeping temperatures below the 1.5 degrees Celsius threshold is a global goal on mitigation.

- **Subsidiary Bodies (SBs)**– essentially committees that assist UNFCCC's governing bodies in implementing and reviewing climate change agreements.
- **2 permanent SBs of the UNFCCC**:
  - **Subsidiary Body for Implementation (SBI)**: It assists UNFCCC governing bodies in the **assessment and review of the implementation of their decisions.**
    - It also facilitates **discussions on financial and technical support** to developing countries which are party to the UNFCCC.
  - **Subsidiary Body for Scientific and Technological Advice (SBSTA):** It a**dvises governing bodies on scientific knowledge** related to climate change.

Blowout

Context

A blowout occurred on June 12 in Sivasagar, Assam, causing an uncontrolled gas leak.

About Blowout

- A **blowout** is a **dangerous and uncontrolled release of oil or natural gas** from a well. It happens when the **underground pressure** in a gas or oil well becomes **stronger than the equipment** designed to contain it.
- **How Does It Happen?**
  - **Drilling Process:** Workers drill into the earth to reach gas trapped under rock. They use **drilling mud** and **blowout preventers (valves)** to manage pressure.
  - **Pressure Overload:** If the underground pressure rises **faster** than the system can handle — due to **faulty valves** or **incorrect mud weight calculations** — gas rushes up through the bore.
  - **Uncontrolled Release:** The gas, mixed with sand, mud, and sometimes oil, shoots out at the surface in a **violent jet**.
- **Why Is It Dangerous?**
  - **Natural gas is flammable** → Even a spark can ignite it, causing **large fires or explosions**.
  - **Harms people and environment** → It can **endanger workers**, **pollute the air**, and **force evacuations**.

Thirstwaves

Context

A new term for prolonged periods of atmospheric thirst has been coined: thirstwaves.

About Thirstwaves

- A thirstwave is defined as at least three consecutive days when daily evaporative demand is greater than its historical 90th percentile value for that period.
- Thirstwaves refer to a combination of factors that drive evaporative demand, including temperature, wind speed, and sunshine.
- **Heatwave Vs. Thirstwaves:** While heat waves result from specific temperature and wind patterns, a thirstwave arises from the combined effects of temperature, humidity, solar radiation, and wind speed.
- **Impact:** More thirstwaves means crops will need more water, and current irrigation deliveries and equipment may not be able to put out water fast enough to keep up with demand.

Evaporative demand

- Evaporative demand measures **how much water the atmosphere wants to evaporate** from the land if enough water is available.
- It reflects the **potential evaporation**, not the actual evaporation — which may be low if water is scarce.
- **Main Drivers:** Evaporative demand is influenced by:
  - **Temperature** (higher temps increase demand)
  - **Wind speed**
  - **Humidity** (lower humidity = higher demand)
  - **Cloud cover** (clear skies increase demand)

- **Link to Drought and Fire:**
  - High evaporative demand can **intensify droughts**.
  - It contributes to **drying out soils and vegetation**, increasing the **risk of wildfires**.
- **Early Warning Indicator:** Extended periods of **above-normal evaporative demand** can help detect:
  - Drought onset
  - Drought intensification
  - Elevated fire danger
- **Environmental Impact:**
  - Leads to **reduced soil moisture**
  - **Stresses crops and plants**
  - Makes vegetation **more flammable**
- **Critical Condition for Wildfires:** When **low rainfall** (below-normal precipitation) overlaps with **high evaporative demand**, it creates **critically dry fuel conditions**, enabling **rapid wildfire spread**.

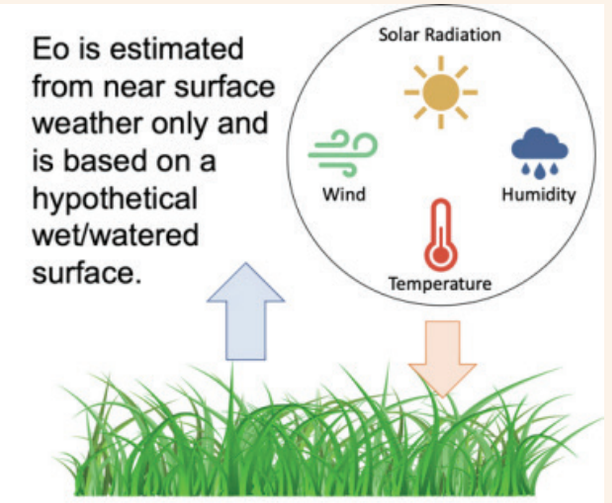


Figure 1. Schematic illustrating the atmospheric drivers of evaporative demand (labeled Eo in the figure) from a well-watered reference surface. Credit: Christine Albano/DRI.

State of Climate in Asia 2024 report

Context

Asia is warming at nearly twice the global average, as per the World Meteorological Organization's State of Climate in Asia 2024 report.

Key Findings of the Report

- **Trends Across Asia:**
  - **Average temperature in 2024**: **+1.04°C** above the 1991–2020 baseline — warmest or second-warmest year on record.
  - The warming trend (1991–2024) is **almost double** the rate seen from 1961–1990.
  - **Heatwaves** lasted from **April to November** in East Asia.
  - **Japan** matched its **hottest summer**, with +1.76°C above normal.
  - **Korea, China, and Russia** recorded multiple **monthly temperature records**.
- **India-Specific Highlights**
  - **Extreme heat**: Temperatures neared **50°C** in **Uttar Pradesh** and nearby regions.
  - **Monsoon 2024**: Overall normal (108% of 1971–2020 average).
- **Sea Surface Temperature (SST) and Sea Level Rise**
  - Asia recorded its **highest-ever sea surface temperatures (SSTs)**, with a warming rate of **0.24°C per decade**, nearly **double the global average** of 0.13°C/decade.
  - **Sea level rise** along the **Pacific and Indian Ocean coasts** surpassed the global average, indicating regional vulnerability.
  - Notable warming hotspots include the **Northern Arabian Sea**, **East China Sea**, **Yellow Sea**, and parts of the Pacific.
  - **Marine heatwaves of extreme intensity** affected the **largest ocean area since 1993**, especially in the **northern Indian Ocean**, **East China Sea**, and **Yellow Sea**.
- **Glacier Loss**
  - 23 out of 24 monitored glaciers in the Central Himalayas and Tian Shan experienced mass loss.
  - This glacier retreat raises the risk of:
    - Glacial Lake Outburst Floods (GLOFs) – sudden floods caused by the collapse of glacier-dammed lakes.
    - Landslides in fragile mountainous terrain.
    - Water security threats for millions dependent on glacial meltwater.
- **Cyclonic Activity**
  - A total of four tropical cyclones formed over the North Indian Ocean in 2024:
  - Bay of Bengal: Cyclones Remal, Dana, and Fengal. Arabian Sea: Cyclone Asna – notably rare, being only the 4th such cyclone since 1891.
- **Rising Climate Hazards**
  - These climate indicators point to a sharpening regional climate crisis, with Asia experiencing:
    - Rapid ocean warming and sea level rise.
    - Accelerated glacier retreat.
    - Increasing frequency and intensity of marine heatwaves and tropical cyclones.

Wildlife Protection (Amendment) Act, 2022

Context

Kerala wants the Wildlife (Protection) Act, 1972 amended so it can be allowed to kill wild animals that foray into human habitats.

Reasons behind Kerala's request to amend the Wildlife (Protection) Act

- **Rising Human-Wildlife Conflict:**
  - **Hotspots:** 273 out of 941 villages identified as conflict zones.

  - **Casualties:** 919 deaths, 8,967 injuries (2016-2025).
  - **Problematic species:** Tiger, leopard, elephant, wild boar, bonnet macaque, peafowl.
- **Population Explosion of Certain Species:** Uncontrolled increase in wild pigs and bonnet macaques, leading to frequent raids on crops and property damage.
- **Failure of Preventive Measures:** Traditional methods like fencing and translocation have failed to control conflict effectively.
  - The current wild boar control system (licensed shooters) has proven ineffective due to impractical guidelines.
- **Legal and Administrative Constraints:** Stringent procedures under existing laws create delays and prevent timely interventions.

Features of Wildlife Protection (Amendment) Act, 2022

Implementation of CITES

- The amendment act seeks to give effect to **India's obligations under the CITES**, which requires countries to **regulate** trade of all **listed specimens** through permits.

Obligations under CITES

- The Act provides for the central government to designate a **management Authority,** which grants **export or import permits** for trade of specimens under CITES.
- Every person engaging in trade of a **scheduled specimen must report the details** of the transaction to the Management Authority.
- As per CITES, the Management Authority may use an **identification mark** for a specimen. The Act prohibits any person from **modifying or removing** the identification mark of the specimen.
- Additionally, every person **possessing live specimens** of scheduled animals must obtain a registration certificate from the Management Authority.

Rationalizing schedules

Earlier	Now
The WPA, 1972 has **six schedules** for specially protected plants (one), specially protected animals (four), and vermin species (one).	The Act **reduces** the total number of schedules **to four** which includes the **removal** of schedule for **vermin species,** and **insertion** of a new schedule for specimens under **CITES.**

Invasive alien species

- The Act empowers the central government to **regulate or prohibit the import, trade, possession or proliferation** of invasive alien species.
- **Invasive alien species** refers to plant or animal species which **are not native to India** and whose **introduction may adversely impact** wild life or its habitat.

Surrender of captive animals

- The Act provides for any person to voluntarily surrender any captive animals or animal products to the **Chief Wild Life Warden.**
- **No compensation** will be paid to the person for surrendering such items. The surrendered items become **property of the state government.**

Conservation reserves

Earlier	Now
Under the WPA 1972, **state governments** may declare areas adjacent to national parks and sanctuaries as a **conservation reserve**, for protecting flora and fauna, and their habitat.	The Act empowers the **central government** to **also** notify a conservation reserve.

Control of sanctuaries:

Earlier	Now
• The WPA 1972, entrusts the **Chief Wildlife Warden** to **control, manage and maintain** all sanctuaries in a state.	• The Act specifies that actions of the Chief Warden must be **in accordance with the management plans for the sanctuary.** • These plans will be prepared as per guidelines of the **central government,** and as approved by the Chief Warden.

Penalties

The Act **increases the fines** for violating the provisions of the Act.

Type of Violation	1972 Act	2022 Act
General violation	Up to Rs 25,000	Up to Rs 1,00,000
Specially protected animals	At least Rs 10,000	At least Rs 25,000

Two more wetlands in Ramsar List

Context

India's Ramsar site tally has increased to 91 (highest in Asia), with the recent addition of two wetlands from Rajasthan.

New Ramsar Sites

Ramsar Site	Details
Khichan Wetland (Phalodi, Rajasthan)	• Located in the northern Thar Desert • It comprises two water bodies, Ratri nadi (river) and Vijaysagar talab (pond), riparian habitat and scrub land. • Recognized for hosting large wintering flocks of migratory demoiselle cranes
Menar Wetland (Udaipur, Rajasthan)	• It is a freshwater monsoon wetland complex formed by three ponds, Braham talab, Dhand talab and Kheroda talab, and agricultural land that connects the latter two. • Among the notable bird species at the Site are the critically endangered white-rumped vulture and long-billed vulture

Ramsar Convention:

- It is an international treaty that aims to promote the conservation and sustainable use of wetlands.
- Ratified by 170 countries (including India), making it one of the most successful international environmental treaties.
- **Ramsar Sites:** It is a wetland site designated to be of international importanceàprotected under strict guidelines of the Ramsar Convention on Wetlands.
- **Montreux Record:** Register which lists wetland sites that are facing or have the potential to face significant environmental changes. Wetlands included in the Montreux Record receive international attention and assistance to ensure their conservation and sustainable use.

Model Rules for Felling of Trees in Agricultural Lands

Context

MoEFCC has issued the 'Model Rules for Felling of Trees in Agricultural Lands' which will act as model guidelines for supporting States and UTs in simplifying regulatory frameworks and promoting agroforestry.

Importance of promoting agroforestry

- Mitigating Climate change and promoting biodiversity
  - Enhancing tree cover outside forest areas.
  - Contributing to India's NDCs under Paris Agreement.
  - Enhancement of ecosystem services.
  - Contributing to India's carbon sequestration goals.
- Critical for addressing India's growing demand for timber, fuelwood and fodder:
  - Reducing reliance on imported timber
  - Reducing pressure on natural forests.
- Increasing agricultural resilience.
  - Improving soil fertility and soil organic carbon
  - Promotes water conservation
  - Ensuring sustainable land use.
  - Diversification of rural livelihoods.

Need for the Model Rules

- Lack of clear, harmonized rules for felling of trees grown on agricultural land, which hampers both cultivation and marketing of agroforestry produce.
- Need for clear rules ensure predictability and ease of doing business for farmers, entrepreneurs and investors.
- Effective market linkages are essential for creating economic opportunities and fostering sustainable agroforestry practices by connecting plantations with wood-based industries and consumers, thereby ensuring that the efforts of landowners and farmers result in tangible financial benefits.

Salient features of the Model Rules

- State Level Committee (SLC) constituted under 'Wood based Industries (Establishment & Regulation) Guidelines, 2016' will act as State Level Committee for these rules.
- State Level Committee will undertake the following functions:
  - Advise on measures to promote agro-forestry in the State/UT.
  - Advise on enhancing timber production from agricultural lands through simplification of felling and transit regimes of commercially important timber species.
  - Empanel agencies for verifying applications for felling of trees from agricultural lands.
- Registration on NTMS: Any applicant having agricultural land wanting to promote agroforestry needs to register their plantations on the National Timber Management System (NTMS) portal.
  - Applicants need to provide basic data of land ownership details, location of farm, species, plantation period etc.
  - Applicants can periodically update plantation information and upload geotagged photos of plantation to ensure traceability.
- Harvesting of trees:
  - Applicants wishing to harvest trees from registered plantations can apply through the NTMS by providing details of trees to be felled.
  - Verifying agencies will conduct site inspections and give verification reports.
  - Verifying agencies will generate felling permits when more than 10 trees need to be cut and no-objection certificate will be issued when less than 10 trees need to be cut.
- Monitoring of Verification Agencies: Divisional Forest Officers will oversee the performance of these agencies through periodic supervision and monitoring.

Species in News

Species	Details
Gharials 	• **Distinctive Features:** – Long, narrow snout with interlocking sharp teeth (adapted for catching fish). – **Bulbous snout tip** (ghara) in males, used for sound production and courtship displays. – Webbed feet and weak legs, making them excellent swimmers but poor walkers. – **Communal nesting:** Many females lay eggs in the same area. – **Parental Care:** Unlike crocodiles, gharials don't carry hatchlings in their mouths but guard them after hatching.. • **Distribution:** Found in **India, Nepal and parts of Bangladesh**. • **Preferred Habitat: Freshwater rivers** with deep pools, **sandy banks** and slow-moving currents. • **Ecological Role:** Primarily **fish-eating** but also **clean up carrion**, keeping rivers healthy. • **Cultural Significance:** Depicted as the divine mount of Goddess Ganga in Indian mythology. • **Conservation status:** – **IUCN:** Critically Endangered – **WPA:** Schedule-I • **Major Threats:** – **Historical Threats:** Overhunting for **skins, trophies, eggs, and traditional medicine**. – **Modern Challenges:** ° **Habitat destruction** (dam construction, irrigation canals, embankments). ° **Siltation and sand-mining** disrupting nesting sites. ° Pollution and river course changes.
Eurasian Otter 	• Also called the **European Otter**, **Common Otter**, or **Old-World Otter**. • A **semiaquatic carnivorous mammal** native to **Eurasia**. • Known locally in Kashmir as **"Vuder"**, once a common part of the valley's aquatic ecosystem. **Distribution** • Among the **widest-ranging mammals** in the **Palearctic** region. • Found across **Europe, Middle East, Northern Africa, Russia, China**, and **other parts of Asia**. • In **India**, it is found in **northern, northeastern**, and **southern regions**, especially in **cold hill streams and mountain rivers**. • Inhabits a variety of **freshwater and coastal ecosystems**: – Rivers, streams, lakes, marshes, swamp forests, and estuaries. • Tolerant of both **highland** and **lowland** water bodies, regardless of size or origin. **Key Features & Adaptations** • **Elusive and solitary** by nature. • Brown fur with a paler underside; long, flexible body, webbed feet, and a thick tail. • **Aquatic adaptations**: – Can close ears and nostrils underwater. – Dense fur traps air for insulation. • Highly developed **sight, smell, and hearing**. **Major Threats** • Water pollution (especially pesticides and industrial effluents). • **Illegal hunting** for its valuable **fur**. **Conservation Status** • **IUCN Red List:** Near Threatened • **Wildlife Protection Act, 1972 (India)**: **Schedule II** • **CITES**: **Appendix I** (International trade is highly restricted)

Species	Details
Ladies slipper Orchid 	• **Appearance:** Yellow cup-shaped flower with purple petals • **Status:** Once thought extinct in the U.K. (by early 1900s) due to over-picking • **Rediscovery:** First wild sighting in **100 years** reported in **Yorkshire Dales**, U.K. (2025) • **Significance:** – Result of **decades-long conservation efforts** – Reintroduction success: wild germination from planted orchids – Hopes for full restoration across former northern England range
Clouded leopard 	**Physical Characteristics**: • Medium-sized wild cat • Distinct coat pattern with cloud-like spots • Exceptionally long canine teeth • Nicknamed "modern-day sabre-tooth" • Largest canines relative to body size among all cats **Habitat and Distribution**: • Found in dense forests across Southeast Asia • Includes foothills of the Himalayas, Northeast India, Bhutan, Myanmar, Thailand, Malaysia, and parts of South China • In India, found in Assam, Arunachal Pradesh, and Meghalaya **Behavior and Diet**: • Arboreal and nocturnal, skilled in tree navigation • Diet includes small ungulates, primates, porcupines, pangolins, birds, and rodents • Recent evidence from Dehing Patkai shows it preying on Bengal slow lorises • Plays role as both predator and prey in the ecosystem. **Conservation Status:** • IUCN Red List: Vulnerable • WPA 1972: Schedule I
Bengal Slow Loris 	• **Physical Characteristics**: – Small, nocturnal primate – Dense, woolly fur and large eyes for night vision – Distinctive round face – Possesses a toxic secretion from its brachial gland – Licks and applies toxin to fur for defense and possible communication • **Habitat and Distribution**: – Resides in tropical and subtropical forests with dense canopies – Found in Northeast India, Bangladesh, Myanmar, Laos, Vietnam, and China – In India, located in Assam, Meghalaya, and Arunachal Pradesh • **Behavior and Diet**: – Slow lorises are arboreal and primarily feed on plant exudates like sap and gum, but also consume insects and small vertebrates. – They are known for their deliberate movements and often occupy the same nocturnal niches as clouded leopards, making them susceptible to predation. **Conservation Status** • IUCN Red list: Endangered • WPA 1972: Schedule I

Species	Details
Portulaca bharat 	• **Taxonomy:** Belongs to the subgenus **Portulaca**. • **Habitat and Discovery:** Found exclusively in the Galtaji Hills of the Aravalli range near Jaipur, Rajasthan. – Only 10 individual plants have been documented in the wild so far. • **Key Identifying Features:** – **Leaves**: Opposite in arrangement and slightly concave in shape. – **Flowers**: Pale yellow, gradually turning creamish-white towards the tip. – **Unique Traits**: Glandular hairs present on stamen filaments; roots are notably thick. • **Naming Significance:** Named **bharat** to symbolically honor India's rich and still-emerging biodiversity. • **Conservation Status (IUCN):** Provisionally classified as **Data Deficient,** due to the absence of known populations beyond the discovery site.
Russel's Viper 	• **Named After:** Patrick Russell, Scottish herpetologist • **Family:** Viperidae (highly venomous) • One of the **"Big Four" deadliest snakes** in India (Others: Common krait, Indian cobra, Saw-scaled viper) • Major cause of **snakebite deaths** in India and South Asia • Found in: **India, Sri Lanka, Bangladesh, Nepal, Pakistan, Myanmar, Thailand, Cambodia, China, Taiwan, Indonesia** • **Habitat:** – Prefers **open grassy/bushy areas**, scrub jungles, farmland, and plantations – Avoids **dense forests** – Often found **near humans** due to rodent prey and farmland presence – Bites usually occur **accidentally**; does not actively attack • **Behavior & Features:** – Mostly **nocturnal** and **sedentary** – Grows up to **1.5 meters** – Identified by **reddish-brown spots** with black-white outlines – **Triangular head**, small vertical-pupil eyes, and overlapping scales – Becomes active **at dusk** • **Danger:** – Fatalities often due to **delayed treatment** – Venom affects **blood coagulation and kidneys** • **Conservation Status:** – **IUCN Red List: Least Concern**

Places in News

Place	News & Details
Paraguay 	**News:** The President of Paraguay, Santiago Peña Palacios recently visited India. **Details** • Landlocked nation in South America. • **Capital**: Asunción. • **Bordering Nations**: Bolivia, Brazil, and Argentina. • The **Tropic of Capricorn passes** through it. • **Major Rivers:** Paraguay (divides country in two parts), Paraná, Pilcomayo. • **Mountains:** Amambay, Mbaracayú, Cordillera de San Rafael. • **Lakes:** Lake Ypoá and Lake Ypacaraí.

Place	News & Details
Columbia 	**News: Recently Gran Tomatina Colombiana** was celebrated in Colombia. It is celebrated **similar to Spain's La Tomatina festival.** **Details** • **Location:** It lies in the northwestern part of South America. It is known as **Gateway of South America**. • **One of the 13 countries** from which the **Equator passes.** • **Capital**: Bogota • **Bordered by:** Venezuela, Brazil, Panama, Peru and Ecuador. • **Bordering water bodies:** Caribbean Sea, Pacific Ocean. • **Major Rivers**: Magdalena, Amazon, Orinoco.
Bulgaria 	**News: European Council** has formally approved Bulgaria's entry into the **Eurozone – 21st country to join the single currency bloc.** **Details** • **Location:** Southeast Europe (Balkan Peninsula). • **Capital:** Sofia. • **EU Membership:** Joined the European Union (EU) in 2007. • **Significance:** – **Will become the 21st member of the Eurozone** (**Group of EU countries using the Euro as their official currency**).
Mauritius 	**News:** Prime Minister Narendra Modi has invited Mauritius PM Navinchandra Ramgoolam to India. **Details** • **Location**: Island nation in the **Indian Ocean**, east of **Madagascar**, off the **eastern coast of Africa**. • **Capital**: **Port Louis** • **Highest Peak:** Mount Piton. • Both the **Indian Ocean Rim Association and the Indian Ocean Commission** have their headquarters in Mauritius.
Cyprus 	**News:** Recently, Prime Minister Narendra Modi visited Cyprus. **Details:** • **Location:** Eastern Mediterranean Sea. • An European Union (EU) member, despite being geographically in Asia. • **Bordering Nations (Maritime):** Turkey, Syria, Lebanon, Israel **(no land borders).** • **Geography:** – **3rd largest Mediterranean island** (after Sicily, Sardinia). – **Highest peak:** Mount Olympus (1,951 m).

Place	News & Details
Venezuela 	**News:** Venezuela has recently declared United Nations High Commissioner for Human Rights Volker Turk persona non grata. **Details** • **Location**: Northern coast of **South America** • **Capital**: **Caracas** • **Bordering Countries:** Guyana, Brazil, Columbia. • **Geographical Features** – **Lake Maracaibo** – Largest lake in South America – **Angel Falls** – World's **highest waterfall** • **Major Rivers: Rio Negro, Orinoco River.** • Venezuela holds the world's largest oil reserves
Croatia 	**News:** PM Modi recently visited **Croatia** during his trip to **Canada for the G-7 Summit.** **Details** • **Location:** Southeastern Europe, on the **Adriatic Sea**. • **Capital: Zagreb**. • **Bordering countries:** Slovenia, Hungary, Serbia, Bosnia & Herzegovina, and Montenegro. • **Memberships:** – **European Union (EU):** Joined in **2013**. – **NATO:** Member since **2009**. – **Schengen Area:** Joined in **2023**. • **Geography:** Known for its **Dinaric Alps**, over **1,000 islands**, and the **Dalmatian Coast**. • **History:** Part of former **Yugoslavia**; gained independence in **1991**.
Algeria 	**News:** Recently Algeria became the 9th **Member of New Development Bank (NDB).** **Details** • **Location:** North Africa located in Maghreb region. – **Maghreb region** comprises the Atlas Mountains and coastal plains of Morocco, Algeria, Tunisia and Libya. • **Bordering Countries:** Tunisia, Libya, Niger, Mali, Mauritania, Morocco. • **Economy**: A major global exporter of oil and natural gas; hydrocarbon exports (95% of its trade revenue).
Strait of Hormuz 	**News: Iran's parliament** has voted to **close the strategically vital Strait of Hormuz** in retaliation to recent U.S. strikes on its nuclear facilities. **Details:** • It is a **narrow waterway** between **Iran** (north) and the **Arabian Peninsula**, specifically the **UAE and Musandam (Oman)** (south). • It **connects Persian Gulf** with the **Gulf of Oman** (to the east). • **Major islands in the strait:** Hengam, Hormuz, and Qishm. • Approximately **30% of the world's liquefied natural gas (LNG)** and **25% of global oil supply** passes through the strait daily.

Place	News & Details

US Bases in Qatar & Iraq

News: Iran launched missile attacks on **U.S. bases in Qatar and Iraq**.

U.S. Bases in Qatar Iraq

Al-Udeid Air Base (Qatar)

- **Location:** Southwest of Doha, Qatar (190 km north of Iran, across the Persian Gulf).
- **Significance: Largest** U.S. military base in West Asia.
  - Serves as the **headquarters of the U.S. Central Command (CENTCOM)** in the region.

Ain al-Assad Air Base (Iraq)

- **Location:** Western Iraq.
- **Significance:** A key U.S. military installation housing **U.S. troops** involved in operations against ISIS and other regional threats.

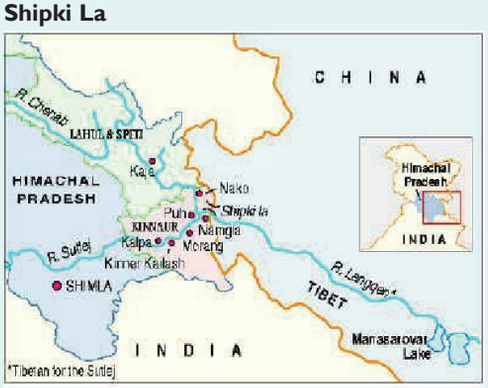
Thitu Island

News: Chinese ship runs aground off Philippines-occupied Thitu Island.

Details:

- **Location:** South China Sea. It is part of the Spratly Islands archipelago.
- This region is a major point of territorial disputes, with China, Taiwan and Vietnam asserting full claims, while Malaysia and the Philippines claim portions of the area.
- It is the largest of the **nine islands currently occupied by the Philippines.**
- **Bordered by**: North Danger Reef, Subi Reef, Loaita and Tizard Banks.

Shipki La



News: Shipki La Pass in Himachal Pradesh, previously restricted due to its strategic location on the India-China border, has been opened for border tourism to boost connectivity and local development**.**

Details

- The pass is on the border between the Kinnaur district in the state of Himachal Pradesh, India, and the Ngari Prefecture in Tibet, China.
- The river Sutlej, which is called Langqên Zangbo in Tibet, enters India near this pass

Upper Siang Project

News:

Details:

- It is a multipurpose hydroelectric project aimed at flood mitigation, maintaining the Siang River's natural flow, and electricity generation with a capacity of 11,000 MW.
- It is located in the Upper Siang District, Arunachal Pradesh, near the Siang River (Brahmaputra).
- **Reservoir capacity:** 9 billion cubic metres (BCM).
- **Installed capacity:** 11,000 MW.
- Jointly developed by **NHPC (National Hydroelectric Power Corporation)** and **NEEPCO (North Eastern Electric Power Corporation Limited).**

Place	News & Details
	• Designed to mitigate flooding from upstream water releases by China and maintain river flow during lean seasons. • **However, the project has raised concerns among the local Adi tribe in Upper Siang and Siang districts, who fear displacement and loss of farmland and homes.** **About Siang River** • **Origin:** Chema Yungdung Glacier, Tibet • Known as **Tsangpo in Tibet** • Major cities along the Tsangpo in Tibet: Lhasa, Shigatse • Enters India in Upper Siang district of Arunachal Pradesh near Tuting • Known as **Siang River in India** • Flows through East Siang district in Arunachal Pradesh • Major city along Siang River: Pasighat • Travels nearly 52 kilometers in India before reaching Assam • Joins Lohit and Dibang rivers in Assam • Combined rivers form the Brahmaputra River • Brahmaputra flows through Assam and Bangladesh before emptying into Bay of Bengal
Dehing Patkai National Park	• **Location & Significance**: – It is located at the foothills of the Patkai Hill Ranges, along the banks of the Dehing River (a tributary of the Brahmaputra), and lies next to the Namdapha Wildlife Sanctuary. – Covers 231.65 sq km of tropical rainforest – Known as the "Amazon of the East" for its rich biodiversity • **Biodiversity**: – **Home to eight wild cat species:** tiger, common leopard, clouded leopard, fishing cat, golden cat, marbled cat, jungle cat, and leopard cat – **Hosts various primates:** Western hoolock gibbon, Assamese macaque, Bengal slow loris • **Conservation Importance**: – Predator-prey dynamics, like clouded leopards preying on **Bengal slow lorises,** maintain ecological balance – Protecting the park is crucial for the survival of these species

INTERNATIONAL RELATIONS & INTERNAL SECURITY

TOPICS FOR MAINS

Possible Outcomes Of Ongoing Israel- Iran Conflict

Syllabus Mapping: GS-2 Global conflicts

Context

Israel and the US launched major airstrikes on Iran's nuclear and military sites, triggering large-scale Iranian retaliation, escalating the regional conflict, and raising global concerns over war and instability.

About Israel-Iran strained relations

- **Historical Background:**
- Iran voted against the United Nations Partition Plan for Palestine and the admission of Israel to the UN
- **Relations during secular monarch:** During the regime of pro-Western leader Mohammad Reza Pahlavi as the shah of Iran, relations between the two countries **significantly improved.**
- **Relation after the Iranian revolution, 1979:** The diplomatic and commercial ties between Iran and Israel were severed during the Islamic Republic.
  - Denounced Israel as an illegitimate state.
  - Cut off all **diplomatic and commercial ties**.
  - Began supporting anti-Israel militant groups (like **Hezbollah** in Lebanon and later **Hamas**).

However, secretive arms deals and intelligence sharing occurred during the Iran-Iraq war.

- **Proxy Conflict:** These are groups that are connected to Iran but not directly controlled. They operate in Iran's interests.
- **Hezbollah:** Hezbollah, a Shia Islamist militant organization involved in Iran–Israel and Israeli–Lebanese conflict.
- **Hamas:** There is war between Israel and Palestinian Islamist group Hamas backed by Iran. Iran claimed victory after the attack of Hamas on Israel on 7 October 2023.
- **Houthi:** Iran-backed Houthis in Yemen target Israel and attack ships transiting the Red Sea.
- **Iran Nuclear :** Israel considers Iran's nuclear program as an existential threat.
- **E.g.** The majority of its population and most of its vital infrastructure and commercial life is concentrated along its narrow Mediterranean coastal plain, making it vulnerable to nuclear threat.

Whereas Iran claims its nuclear program is 100% peaceful.

Reasons for Iran's pursuance of nuclear weapons

- **Symbol of Leadership:** Iran positions itself as a revolutionary and ideological leader in the Islamic world—particularly in contrast to Sunni powers like Saudi Arabia.
- Symbol of commitment to scientific research and advancement: Nuclear weapons as **civilizational and technological achievement**.
- **Core Motivation:** Security guarantee and nuclear deterrent against the USA and other belligerent powers in its neighbourhood. Iran is surrounded by real and perceived threats:
- **U.S. military presence** in the Gulf, Iraq, and Afghanistan.
- **Hostile regional powers** (Israel, Saudi Arabia, UAE).
- History of invasion (e.g., Iraq's 1980 attack on Iran, and the 1953 CIA-backed coup).

Reason for the attack on Iran by Israel in June 2025

Israel launched an attack on Iran under **'Operation Rising Lion'**. Under this, Israel targeted more than 100 targets in Iran with more than 200 fighter jets.

- **Against the Nuclear weapon:** Israel's attack was a "preventive attack" meant to address Iran's construction of a nuclear bomb.
- **Issues raised by IAEA:**
- IAEA board passed a resolution declaring that Tehran was breaching its non-proliferation obligations.
- IAEA report highlighted significantly increased production and accumulation of highly enriched uranium by Iran.
  - **E.g.** Iran has enriched up to 400kg of uranium to 60 percent – not far below the 90 percent enrichment that is needed to make weapons.

- Iran's actions and its refusal to cooperate with the IAEA across a wide range of monitoring issues causes the IAEA to doubt the peaceful Nuclear program.
- **Nuclear Negotiation Breakdown:** Talks between the US and Iran in Oman stalled over uranium enrichment disputes.
  - Israel blamed Iran for continuing advancing its nuclear capabilities in secret, using diplomacy as cover.
- **Domestic pressure on Benjamin Netanyahu:** The prolongation of the war in Gaza and attack on Iran has ensured to maintain his grip on power, considering his uncertain political prospects in a future election.

Global Implications

- **Regional Destabilization:** Intensified conflict risks dragging Lebanon, Syria, and Gulf states into war, undermining regional security architecture.
- Iran also fired missile in retaliation **(Operation 'True Promise 3')** on Israel escalating the regional conflict
- **Nuclear Proliferation Threat:** Incomplete destruction of Iran's nuclear sites may push Tehran to accelerate weaponization clandestinely.
- **E.g.** Intelligence suggest that despite the directly intervention of US in the conflict **("Operation Midnight Hammer")** with bunker-buster bombs, the bomb maki capability is not diminished
- **Threat to Multilateralism:** Unilateral action of Israel and US against Iran sidelining the UN, UNSC weakens multilateralism.
- It gives authoritarian states justification to do the same—bypassing international law (e.g., Russia in Ukraine, China in Taiwan Strait).
- **Economic Volatility and Oil Shock Risk:** Rising conflict threatens **global oil routes** through the Strait of Hormuz, with ripple effects on **energy markets, inflation, and trade**.
- **Push back diplomatic efforts:** Nuclear talk will take back stage between Iran and USA as Iran refused to talk on table due to its disrespect to sovereignty.
- **Threat of a Prolonged Stalemate:** With key Iranian installations still operational and global alarm mounting, Israel now faces the possibility of being drawn into a long, expensive, and inconclusive war.
- **Civilian Suffering and Displacement:** Civilian casualties and infrastructure damage in both countries may deepen humanitarian crises and domestic unrest.
- **US Geopolitical Dilemma:** US intervention complicating its strategic balance between Israel and Gulf allies.
- **Global Polarisation:** The conflict may widen rifts between pro-Israel Western powers and nations backing diplomatic restraint like China and Russia.

Impact on India

- **Balancing the foreign policy:** India will be in tightrope to balance the foreign policy in the West Asia due to Israel -Iran Conflict
- **E.g.** India distanced itself from an SCO statement that strongly criticized Israel's attacks on Iran. This can impact the strategic partnership with Iran
- **Ties with the Gulf Region:** West Asia is the source of 40% of its remittances, 54% of oil imports and the region accounts for over $170 billion in trade.
- A perceived pro-Israel shift will have reputational impact for India.
- **Energy Security:** Any escalation in West Asia will have a direct impact on energy security as 40-50% of India's energy imports come through the area.
- **E.g.** Iranian parliament passed a resolution to close the Strait of Hormuz.
- **Diaspora issues:**
- Safety and security of Indian in conflict ridden areas will be impacted
- Arranging work and study opportunities who are coming back or they end up returning to the conflict zones
- Decrease in Remittance from these countries.
- **Disruption in Trade:** Due to conflict in the gulf region trade declined. It further can decline in recent events.
- **Drop in oil trade from Iran:** From $14 billion in 2017 to $1.4 billion last year.
- **Drop in trade with israel:** from $11 billion in 2022 to $3.75 billion last year
- **Financial impact:**
- **Inflation:** If the Strait of Hormuz is closed it could sharply increase oil and LNG prices.
- **Exports:** Shipping costs, security, and insurance premiums would rise, leading to more costly imports, less competitive exports, and inflation.
- **Connectivity plans:** IMEC, INSTC and Chabahar port project will be impacted
- **Challenge in Multilateral forums:**
- Global South has been very critical of Israel's war in Gaza, has also expressed sympathies with Iran
- In the future India will face a harder challenge in separating itself from any statement in BRICS Summit in Brazil against Israel.

Way Ahead

- **Urgent Ceasefire Mediation:** Neutral actors like the UN or Gulf states must broker a ceasefire to prevent wider war.
- **Reopen Diplomatic Channels:** Both sides should be pushed toward backchannel talks, possibly via Oman, UAE, or EU mediators.
- **Global Non-Proliferation Push:** The IAEA must be empowered to inspect and stabilize Iran's nuclear programme with international oversight.
- **Limit External Involvement:** U.S., Russia, and China must avoid direct entanglement and instead focus on de-escalation frameworks.
- **Humanitarian Support:** Immediate international aid is needed for affected civilians in both Israel and Iran.
- **Address Root Tensions:** Long-term peace requires addressing Iran-Israel hostilities via a new West Asia security architecture.

What happens if Iran chooses to leave the Nuclear Non-Proliferation Treaty?

Syllabus Mapping: GS-2 Nuclear non proliferation

Context

Amid the heightened military tensions between Iran and Israel, Iran stated that its Parliament was preparing a Bill to potentially leave the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

About the Nuclear Non-Proliferation Treaty(NPT)

- The **NPT**, signed in **1968** and in force from **1970**, is a **landmark international treaty** aimed at:
  - **Preventing the spread** of nuclear weapons and technology.
  - **Promoting peaceful uses** of nuclear energy through international cooperation.
  - Working towards **global nuclear disarmament**.
- **Key Provisions:**
  - Only five countries are recognized as **nuclear-weapon states (NWS)**: **USA, UK, France, Russia, and China** — defined as those that tested nuclear weapons before **1 January 1967**.
  - **Non-nuclear-weapon states (NNWS)** commit not to pursue nuclear weapons.
  - NNWS are entitled to **access nuclear technology for peaceful purposes**, under **IAEA safeguards**.
  - **Verification Mechanism:** IAEA inspectors conduct regular site visits to verify compliance and uphold the integrity of non-proliferation norms.
- Today, **191 countries** are parties to the treaty. Iran has been a signatory since 1970.
  - However, **India, Pakistan, and Israel** have never signed it. **North Korea** signed in 1985 but withdrew in 2003.

Article 10 of the Nuclear Non-Proliferation Treaty (NPT) – Withdrawal Clause

- **Right to Withdraw:** Any State Party has the right to **withdraw from the Treaty** if it decides that **extraordinary events related to the subject matter** of the Treaty have **jeopardized its supreme interests**.
- **Notice Requirement:** The withdrawing state must **give notice 3 months in advance** to all other Parties and to the **United Nations Security Council (UNSC)**.
- **Justification Required:** The withdrawal notice must include a **statement of the extraordinary events** that the state believes have jeopardized its supreme interests.

Consequences if Iran Exits the NPT

- **Loss of IAEA Oversight:** Iran would no longer be legally obligated to allow **IAEA inspections** of its nuclear facilities.
  - The average **1.4 daily inspections** (as of 2023) would stop, increasing opacity.
- **Increased Regional Tensions:** Iran's withdrawal could **escalate fears of a nuclear arms race** in the Middle East, especially among regional rivals like **Saudi Arabia and Israel**.
- **Undermining Global Non-Proliferation Regime:** Iran's exit might **weaken the credibility** of the NPT and set a **precedent for other states** to consider withdrawal, destabilizing the global nuclear order.
  - NPT acts as a "critical bulwark" against the spread of nuclear weapons.
- **Potential for Weaponization:** Though Iran claims no intent to develop nuclear weapons, **exit from NPT** could allow it to pursue them without international legal constraints.
- **Geopolitical Fallout:** Likely **UNSC action, new sanctions**, and possibly **pre-emptive strikes or cyber operations** from rival states. It could further isolate Iran diplomatically and economically.

- **Loss of Peaceful Nuclear Cooperation:** Withdrawal would cut off **international technical and economic support** for peaceful nuclear energy projects.

Way Forward:

- **Press for descalation:** Instead of claiming victory there is need for complete de-escalation and ceasefire to prevent wider regional conflict.
- **IAEA inspection:** It is critical for the IAEA to begin to assess the damage at Iran's nuclear sites and account for Iran's nuclear materials
- **Diplomatic steps:** US needs to work with Russia and China – allies of Iran – to persuade Tehran against walking away from the NPT,
- **Nuclear Deal:** Successful nuclear diplomacy—hard as it might be—is still possible, and remains the best option for both Iran and the United States.

India and NPT

- India is not a signatory to the NPT, citing its discriminatory nature as it allows those who had nuclear weapons on a specific date to continue to have them while banning others from access to atomic bombs.
- India's primary objection lies in the treaty's division of the world into nuclear 'haves' and 'have-nots'.
- The treaty does not force the US, Russia, China, France and the UK to eliminate their atomic weapons.
- India has consistently advocated for a universal, non-discriminatory, and verifiable disarmament regime.

Strengthening the India-Australia Defence Partnership in a Shifting Global Order

Syllabus Mapping: GS-2 Bilateral relations

Context

India and Australia celebrated 5 years of Comprehensive Strategic Partnership (CSP) in June. Both with aligned interests amid Trump's unpredictable policies and changing global power dynamics , must deepen defence cooperation to ensure regional security and stability.

Highlights of the recent visit of Australian Deputy Prime Minister and Defence Minister:

- Welcomed the signing of the **Australia-India Joint Research Project** and agreed to intensify and diversify collaboration in the defence industry.
- Discussed issues like cyber and emerging technologies, defence industry partnerships, hydrography, maritime security, and counter-terrorism.

Reason for Strengthening Security Partnership with Australia

- **Shared Concerns over China's Assertiveness:** Both nations face strategic challenges from China, making collaboration essential for counterbalancing regional power shifts.
  - **E.g.** Australia has been opposed to China's design in the oceania and south-china sea region. Both countries have joined the QUAD grouping
- **Geostrategic Complementarity:** Australia's location bridges the Indian and Pacific Oceans, supporting India's maritime ambitions and Indo-Pacific outreach.
  - **E.g.** Both are committed to an open, inclusive, peaceful Indo-Pacific with adherence to international laws like UNCLOS.
- **Proven Operational Synergy:** Existing frameworks like **CSP 2020, the 2+2 Dialogue, and joint exercises (AUSINDEX, AUSTRAHIND, Malabar)** show operational compatibility and trust.
  - **E.g.** Australia and India concluded the **Mutual Logistic Support Arrangement (MLSA)** in 2020
  - **Air-to-air refuelling agreement:** India and Australia strengthen air force cooperation through air-to-air refuelling, enhancing military reach in Indo-Pacific region
- **Reliable Middle Power Alliance:** In an uncertain global security environment, Australia offers a dependable alternative to over-reliance on the U.S.
- **Defence Technology and Industrial Cooperation:** Australia's advanced defence ecosystem, including its MSME sector, aligns well with India's indigenisation drive and tech ambitions.
- **Influence in the Pacific:** Australia's established relations with Pacific Island nations complement India's growing regional diplomatic and security interests.

Challenges in India-Australia Defence partnership:

- **Ambiguity in defence relations:** There is an ambiguity in defence and strategic side among both sides.
  - While India aims to gain from closer defence and strategic ties with Australia, India does not want to become a treaty or alliance partner with it. Also, while India wants to counter China, it also wants to engage China by joining forums like SCO, BRICS, AIIB etc.
  - Western countries are also not comfortable in sharing critical defence and intelligence with India. Despite being a QUAD partner, India was not made a party to the AUKUS i.e. not given access to strategic nuclear submarines by the USA, UK & Australia.
  - Also, despite India's interests in joining Five Eyes Alliance, India has not been made a part of it.
- **Defence exercises are in silos:** There is lack of comprehensive defence exercises due to lack of unified approach in the defence forces.
  - **E.g.** there is increased cooperation in Navy-to Navy but service barriers exist. Air force and army cooperation remains minimal, with little to no joint training or strategic dialogue in these domains.
- There is a lack of cooperation in the maintenance , repair and overhaul(MRO) of naval and Patrol vessels that shows **lack of joint intentions and capabilities.**
- **Weal industrial collaboration: No major defence co-development or co-production projects** exist between the two.
  - Limited presence of Australian defence companies in the Indian market and vice versa.
  - Australia's defence export controls, tied closely to US and NATO-aligned frameworks, can complicate **technology transfer**.
- **Asymmetric Strategic Priorities:** Australia is more focused on the Pacific theatre and China's expansion in Southeast Asia, while India's primary concerns lie in the Indian Ocean and continental threats from Pakistan and China
- **Underdeveloped Maritime Domain Awareness (MDA) Coordination:** Australia is part of **US-led intelligence sharing arrangements (Five Eyes)**; India is not—this limits **real-time intelligence coordination**.

What Steps India Must Take

- **Expand Joint Military Engagement:** Break service silos through large-scale tri-service joint exercises and establish a dedicated joint staff forum.
- **Upgrade Defence Representation in Canberra:** Elevate India's Defence Adviser post to a one-star rank and deploy dedicated Army and Air Force assistants.
  - A higher-ranking officer can directly engage with **senior Australian defence officials.**
  - Dedicated **Army and Air Force assistants** would allow **all three Indian services (Army, Navy, Air Force)** to be represented in Australia.
  - **Faster decisions, better inter-service integration**, and smoother logistics during military exercises, HADR operations etc
- **Encourage Bottom-Up Strategic Dialogue:** Include more uniformed professionals and operational experts in bilateral discussions; enable classified discussions and war-gaming exchanges.
- **Collaborate on Naval MRO and Manufacturing:** Partner on maintenance, repair, and overhaul (MRO) for naval assets; co-develop patrol boats for small island nations.
- **Align MSME Ecosystems:** Facilitate defence startup collaborations and tech-sharing through an India-Australia MSME defence corridor or a model like INDUS X.
  - **E.g.** Promote **co-development of niche technologies** (e.g., drones, AI, surveillance systems).
- **Deepen Indo-Pacific Outreach Together:** Jointly support security and development in the Indian Ocean Region and Pacific Islands, showcasing responsible regional leadership.
  - **E.g. Information Sharing**: Expand real-time collaboration through initiatives like India's **Information Fusion Centre–Indian Ocean Region (IFC-IOR)** and Australia's **Pacific Fusion Centre**..

The Great Churn in Asia

Syllabus Mapping: GS-2, Global Power Politics

Context

Asia's geopolitical landscape is undergoing rapid transformation driven by US-China tensions, strategic realignments, and domestic political shifts, compelling India to recalibrate its foreign policy with enhanced autonomy and flexibility.

The Geopolitical Churn in Asia: Causes and Contours

- **US–China Rivalry:** The **strategic competition between the US and China** spans trade, technology, military posturing, and influence campaigns.

  - **E.g. China's Southeast Asia Outreach (April 2025)**: President Xi Jinping's visits to **Vietnam, Malaysia, and Cambodia** aimed to **solidify economic partnerships** and **reduce reliance on Western supply chains**
  - Over **75 agreements** signed, including in **AI, infrastructure, and digital economy**, e.g., the **Funan Techo Canal in Cambodia**
  - It reduces the influence of india in Southeast Asian Countries and more integrated to China
- **Shifting domestic politics** in Asian nations like South Korea
  - **Example**: In South Korea the **likely election of Lee Jae-myung**, a progressive leader, signals a **pivot from conservative foreign policy** under Yoon Suk Yeol.
  - He advocates for **greater engagement with China** and **North Korea**, possibly **weakening US-led military alignments** in Northeast Asia.
- The emergence of **strategic autonomy** among mid-sized powers (e.g., India, France, South Korea).
  - **E.g. French President Macron in Shangri-La Dialogue(June 2025)** in Singapore called for **European and Asian countries to build a coalition of independent countrie**s in Indo-Pacific to maintain strategic autonomy amid US-China tension
  - India, too, has championed **strategic autonomy**, refusing to join military alliances while deepening cooperation with diverse partners (Quad, BRICS, SCO).
- **Economic de-risking**, realignment of supply chains, and energy security concerns.
  - Global trend of **economic de-risking**—moving production out of China to reduce dependency—has reshaped trade flows and investment patterns.
  - Threat to **supply Chain of Critical elements amid** US-China trade war
  - **Weaponisation of e-supply chain:** China is strategically using its dominance in electronic supply chains to exert geopolitical influence.
    - **E.g.** China restricts the travel of its engineers and technicians,and curbs on the export of critical, specialized manufacturing equipment over which it has a monopoly.
- **Contours**: The visible **shapes or outlines** of this churn, such as:
  - **Evolving security architecture** in the Indo-Pacific (e.g., Quad, AUKUS): this also reflects the US-China rivalry for dominance in the Indo-Pacific region.
  - **Tensions in Taiwan Strait, South China Sea, and Korean Peninsula**.
    - **E.g.** China's assertiveness over Taiwan continues to escalate.
    - South China Sea sees frequent **naval confrontations** between China and regional claimants (e.g., Philippines, Vietnam).
  - **New coalitions and regional alignments**, often bypassing traditional Cold War-era blocs.
    - **E.g.** India–France–UAE trilateral, India–Australia–Indonesia strategic dialogues, or **BRICS+ initiatives** with new members.
    - These arrangements are more **flexible, pragmatic**, and **less ideologically rigid** than older alliances.

Implications of the Asian Churn

Dimension	Trends & Consequences
Security Architecture	Dilution of traditional alliances; regional defence groupings like AUKUS, Quad, and trilateral US-Japan-Korea emerging.
Economic Order	Shift from globalization to **'de-risking'** supply chains; Indo-Pacific Economic Framework (IPEF) vs. RCEP.
Diplomatic Alignments	Strategic autonomy gaining favour; multialignment replacing non-alignment.
Technological Race	Chip wars, AI regulations, semiconductors becoming core national security interests.

India's Path Amidst the Churn

- **Embrace Strategic Autonomy 2.0:** India must avoid binary alignments — neither bandwagon with the US nor appease China.
  - Adopt a **multi-vector approach**: strong US, EU ties, but engage Russia, ASEAN, and Global South.
- **Build Resilience Through Economic & Technological Sovereignty:**
  - **Economic Security:** Boost domestic manufacturing, especially in semiconductors, clean energy, and defence.
  - **Digital Sovereignty:** Invest in indigenous AI models, digital public infrastructure, and participate in global rulemaking on emerging tech.
    - **E.g.** India is working with OECD, and the Global Digital Compact on ethical AI standards and data localization rights.
- **Military Modernisation:** Enhance naval and air capabilities to deter coercion in the Indo-Pacific. Instead of solely depending on QUAD, support multilateral institution against hegemony of any power.

- **Deepen Regional Partnerships:**
  - **Act East 2.0:** Go beyond diplomatic engagement — enhance **infrastructure investments, digital cooperation, and cultural diplomacy** with ASEAN, Japan, and South Korea.
  - **Quad+ Initiatives:** Leverage Quad on tech, climate, health, and maritime security.
- **Reclaim Leadership in Global South:** Lead consensus-building forums like the **BRICS, Indian Ocean Rim Association (IORA), India Brazil South Africa (IBSA) forum**, and **Global South Summits** to shape rules on trade, AI, and climate justice.
- **Maintain Flexibility in a Fragmented Order:** Prepare for a **multiplex world**, not bipolar — with overlapping networks of cooperation and contestation.
  - India must retain room to manoeuvre on emerging issues like AI ethics, internet governance, supply chain resiliency, and green transitions.

A Eurocentric reset, a gateway for India

Syllabus Mapping: GS-2 Policies of Developed countries and its Impact

Context

The renewed UK-EU agreement signals more than a regional development — it has deep implications for India's trade, diplomacy, and diaspora, demanding timely strategic responses.

Significance of UK and EU for India

- **Major Trade Partners:** The **European Union** is India's **second-largest export destination**, accounting for **$86 billion** in exports in **FY2024**.
  - The **United Kingdom** alone received **$12 billion** worth of Indian exports in the same fiscal year.
- **Pharmaceutical Sector Dependence**: India supplies **over 25%** of the **UK's generic drug requirements**, playing a vital role in the British healthcare system.
  - A unified U.K.-EU regulatory regime could streamline **drug approval processes**, reducing costs and boosting efficiency for Indian pharma companies.
- **Seafood and Agro Exports**: India's seafood exports touched **₹60,523.89 crore (~$7.38 billion)** in **FY2024**.
  - Alignment of food safety and fisheries policies between the UK and EU can help reduce **non-tariff barriers** and **custom delays** for Indian exporters.
- **Strategic and Defence Cooperation**: India's bilateral trade with **France** reached **$15.1 billion in 2024-25**.
  - India has signed key **defence and technology transfer agreements** with **France, Germany, and the UK**, which can be further deepened under a coordinated UK-EU defence policy.
- **Diaspora and Education Ties**: The UK issued over **1,10,000 student visas** to Indian nationals in **2024**, placing India among the top sources of international students.
  - A reset in UK-EU border policies could allow partial professional and academic mobility across both regions for Indian talent.
- **Multilateral Cooperation Platforms**: India maintains a **Strategic Partnership Roadmap to 2025** with the EU and a **Comprehensive Strategic Partnership** with the UK.
  - Greater UK-EU alignment could strengthen India's position at global forums like the **UN, G-20, and WTO**, enhancing India's voice on issues like **climate finance**, **digital public infrastructure**, and **reforms in global governance**.

Key Hurdles for India

- **Regulatory Complexity Post-Brexit:** Since Brexit, Indian exporters have faced the burden of complying with **two distinct regulatory regimes** — one for the UK and another for the EU.
  - This has been especially difficult for **pharmaceuticals, textiles, seafood**, and **agro-products**, where compliance requirements are highly technical and vary by region.
- **Stricter Unified Standards Could Hurt MSMEs**: A harmonised UK-EU food safety and product certification regime may lead to **more stringent sanitary and phytosanitary (SPS) standards**.
  - **E.g.** in 2024, the EU food safety authorities found cancer-causing chemicals found in 527 Indian food items and banned it in the market.
- **Export Ecosystem Limitations**: India still struggles with **logistics costs**, which are around **13–14% of GDP**, compared to **8–9% in developed economies**.
  - The new **EU Carbon Border Adjustment Mechanism (CBAM)** has also been a point of dispute.

- **Talent Mobility Constraints**: After Brexit, **Indian professionals** faced reduced access to EU job markets due to the UK no longer being a bridge to Europe.
  - While over **1,10,000 student visas** were granted by the UK in 2024, **professional migration** opportunities into the broader EU space have remained fragmented.
- **Trade Defence Measures and NTBs**: The EU frequently imposes **anti-dumping duties and technical barriers** on Indian goods.
  - **E.g.**, India has faced **anti-dumping investigations** in the EU on **steel, chemicals, and textiles** — sectors crucial to its export profile.
- **Uncertain Geopolitical Balancing**: The UK-EU strategic realignment may push India to **balance between transatlantic powers and its own strategic autonomy**.
  - India must ensure that its deeper engagement with France and Germany is not complicated by a **renewed EU foreign policy bloc** that expects tighter alignment on issues like **Russia**, **China**, and **human rights**.

Way Forward for India

- **Leverage Unified Regulatory Space**: Push for streamlined export approvals, especially for pharma, seafood, and textiles.
- **Support MSMEs**: Expand Production-Linked Incentive (PLI) and Remission of Duties and Taxes on Exported Products (RoDTEP) to enhance product quality and compliance readiness.
- **Deepen Strategic Ties**: Enhance trilateral initiatives with France-Germany-UK for defence and technology cooperation.
- **Negotiate Mobility Pacts**: Embed talent and migration agreements within UK-EU coordinated frameworks.
- **Upgrade Export Infrastructure**: Invest in logistics, digital compliance systems, and standards certification.
- **Amplify Global Role**: Use the U.K.-EU reset to build a cohesive Western support base for India's leadership in global governance, climate action, and digital equity.

Trump-era volatility has drawn India & Europe Closer

Syllabus Mapping: GS-2 Policies of Developed countries, Regional groupings

Context

The shifting global order, particularly marked by the **Trump-era unpredictability**, has created fissures within the Western alliance. Amid these disruptions, **India and Europe** have found new strategic alignment, driven by mutual interests in stability, multipolarity, and economic diversification.

How Trump-Era Volatility Has Drawn India & Europe Closer

- **US Unpredictability:** Trump's transactional view of alliances (e.g., NATO, Five Eyes).
  - Questioning US commitments to Ukraine and global security.
- **Europe's Strategic Autonomy Push:** France, Germany, and UK strengthening EU-led defence mechanisms.
  - Europe's search for diversified partners in Indo-Pacific aligns with India's strategic interests.
- **India's Balancing Act:** India views Europe as a **"swing state"** in a US-China dominated order.
  - Both sides now prioritize **bilateral and multilateral engagement** (e.g., EU-India TTC, FTA talks, IMEC corridor).

Significance of the Growing India-Europe Engagement

- **Geopolitical Stability:** Shared interest in **multipolarity,** effective multilateralism and **rules-based global order**.
  - Collaboration in the Indo-Pacific to counter China's assertiveness. India and the EU jointly call for adherence to **UNCLOS** in the Indo-Pacific.
- **Uncertainty due to Trump:** The Trump era created doubts about US commitment to alliances and free trade. This made the EU and India look for alternative, reliable partners.
  - India's size and economic growth has long made it an attractive partner for the EU.
  - India also seeks renewed relationships elsewhere to hedge against uncertain America.
- **Economic Cooperation:** India-EU **Free Trade Agreement (FTA)** on the horizon.
  - Joint efforts on **critical minerals, AI, green tech, space, quantum computing**.
  - Europe's **focus on de-risking supply chains from Chinese products.** It is shifting supply chains to trusted partners like India.
  - Indian also **interests in attracting greater industrial investment from EU** companies as part of China+1 strategy

  - **EU-India Trade and Technology Council (TTC) was launched** in 2023 to coordinate economic and strategic cooperation in response to China.
- **Defence and Strategic Ties: ReArm 2025 plan** by Europe offers India opportunities for co-development. Moving from arms transactions to **long-term defence partnerships**.
- **Connectivity Initiatives: India-Middle East-Europe Economic Corridor (IMEC)** as a counter to China's BRI. Enhanced Eurasian connectivity and secure supply chains.
- **Diplomatic Leverage:** Europe provides India greater **strategic depth** beyond its traditional partners (e.g., US, Russia).
  - India's engagement in G7 formats and security dialogues underscores its rising profile.
- **Resilience Supply Chain:** India and EU work with the aim of promoting value chains that can withstand global challenges.
  - E.g Both are working to strengthen semiconductor supply chains
  - EU's Chips Act and India's production-linked incentives aim to boost manufacturing
  - Both aim to enhance transparency and security in APIs supply chains

Challenges in India-Europe Cooperation

- **Diverging Foreign Policy Priorities:** EU's normative stance on **human rights** and **domestic policies** in India.
  - India's strategic autonomy vs Europe's institutional multilateralism.
- **China Factor:** Europe's mixed stance on China hampers full alignment with India's Indo-Pacific vision.
- **Security Constraints:** Despite rising defence budgets, Europe remains dependent on US for key security guarantees.
  - India's sensitivity toward **third-party defence groupings**.
- **Slow Bureaucracy and Trade Talks:** India-EU FTA negotiations have been delayed since 2007 due to disagreements on tariffs, data privacy, and IP rights.

Issues in India-EU FTA

Agriculture and Dairy:

- **High Tariff:** India imposes a 39 percent tariff on agricultural imports, viewed as unfair by the EU against an average MFN tariff of 11.7 percent on Indian exports.
- **Market access demand:** EU demands for greater access to India's dairy market, particularly for European cheeses.

Service sector:

- **Restriction on digital trade:** EU restricts remote service delivery (Mode 1) by requiring Indian firms to set up local offices and maintain high minimum salary thresholds for Indian professionals working in Europe.
- **Data secure country:** India demand EU to recognize it as a 'data secure country' under the General Data Protection Regulation (GDPR). Without this status, Indian companies handling EU citizens' data face additional compliance costs and legal barriers
  - The EU is urging India to adopt stronger privacy regulations aligned with GDPR, but India sees this as an unnecessary burden on its digital economy.
- **Service sector market access:** India demand easier business visas (Mode 4) for its professionals travelling to the EU for short-term assignments.
  - On the other hand, European firms are seeking greater access to India's banking, legal, accountancy, auditing, and financial services sectors.
- **Government procurement:** EU is pushing for access to India's lucrative government procurement (GP) market. Whereas EU's own procurement market is largely closed to external firms
- **Investment protection:** India has proposed its Model Bilateral Investment Treaty (BIT) as the framework to protect India's regulatory autonomy whereas the EU wants India to relax its investment protection
- **Intellectual Property Rights(IPR):** EU want India to agree to TRIPS-plus provisions, which go beyond the WTO's Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement
  - On GI tagging: EU wants automatic recognition without standard verification process

Carbon Border Adjustment Mechanism (CBAM):

- India raised concerns over the EU's evolving sustainability regulations
  - **E.g.** CBAM, which imposes a 20–35 percent levy on carbon-intensive imports concerning India, whose iron and steel exports to the EU were valued at US$6.64 billion in FY 2023–24.

Way Forward

- **Build Issue-Based Convergence:** Focus on areas of **practical cooperation** like climate action, supply chain resilience, digital governance, and connectivity.
- **Institutionalise Strategic Dialogue:** Regular summits, working groups (like the TTC), and **Track-1.5/Track-2 dialogues** to iron out differences.

- **Flexibility in Trade Talks:** Prioritize a **narrower trade deal** (early harvest agreement) before an ambitious FTA.
- **Expand Defence Ties:** Promote **joint R&D, tech sharing, and co-production** under Europe's defence modernisation plan.
- **Leverage Multilateral Forums:** Strengthen India's voice in **G7, I2U2, and EU+ formats**, positioning itself as a bridge between West and Global South.

Roadmap for the conclusion of EU FTA by 2025:

- **Phased Negotiation Strategy**
  - Conclude low-conflict chapters first (e.g., R&D, digital cooperation, customs procedures).
  - Conclude a limited trade agreement (early harvest deal) while continuing negotiations on contentious issues.
- **Balanced IPR Framework:** Avoid blanket TRIPS-plus provisions; adopt flexible timelines and sector-wise commitments.
- **Sustainable Trade Transition:** EU should support India's green transition via technology transfer and carbon credit mechanisms instead of unilateral CBAM levies.

U.K.-India FTA and cultural relations

Syllabus Mapping: GS-2 Bilateral Relations

Context

In May 2024, India and the U.K. achieved two landmark developments — a long-awaited Free Trade Agreement and a cultural cooperation programme, marking a new phase of deep cultural and economic engagement.

India-UK FTA

- **Free Trade Agreement (FTA) Ratified:** Both nations ratified the FTA, enhancing bilateral trade and opening new sectors including the creative economy.
  - It sets the stage for deeper investment and people-to-people ties.

About India-UK FTA

- **India will cut levies on 90% of British products.** Within a decade, 85% of British products sold will become tariff-free in India.
  - **E.g.** Whisky and gin tariffs will decrease from 150% to 75% initially, and to 40% over a decade.
- Automotive tariffs will drop from over 100% to 10% under a tariff rate quota system
- **Britain will cut tariffs on the Indian products in its market**. This will mean 99% of India's exports to Britain face no duties.
- The removal of a tariff provide opening massive export opportunities for sectors like textiles, marine products, leather, footwear, sports goods will benefit India's

Benefit of India-UK agreement

- **Economic growth and jobs:** Bilateral trade, valued at US$60 billion (£42.6 billion) in 2024, is projected to double to US$100 billion (£ 75 billion) by 2030, boosting national growth for both economies.
- **Services and professional mobility:** The agreement eases mobility for professionals, including contractual service suppliers, business visitors and independent professionals like yoga instructors, musicians, and chefs, offering "greater global mobility for aspirational young Indians".
- **Supply chains:** Non-tariff barriers are addressed to ensure free flow of goods and services, enhancing supply chain resilience.
- **Labour intensive sector of India will be benefited: E.g.**
  - **Textiles and apparel:** Zero duty on shirts, trousers, dresses, and bed linen boosts exports and jobs.
  - **Leather and footwear:** Tariff elimination drives export growth and employment.
  - **Agriculture and marine products:** Grapes, mangoes, and marine products gain a competitive edge.
- **Consumer benefits:** UK consumers can expect to enjoy lower prices on Indian apparel, shoes, and food items like marine products. Indian consumers may benefit from reduced costs on UK goods like whisky, cosmetics, and medical equipment
- **Amid rising trade tension:** It is particularly important in a global environment of rising trade tensions and highlights the critical role of partnerships for shared progress and prosperity.

Concern:

- **Carbon Tax:** UK's Carbon Border Adjustment Mechanism (CBAM), commonly referred to as a carbon tax, could disrupt the balance in the India-UK FTA
- **Bilateral investment Treaty(BIT):** India-UK BIT is still unresolved, raising concerns regarding dispute resolution timelines and taxation provisions.

Signing of Programme of Cultural Cooperation (POCC):

It was signed on May 2, 2024, by U.K. Culture Secretary Lisa Nandy and India's Culture Minister Gajendra Singh Shekhawat.

- It is a formal roadmap to strengthen cultural exchanges between the two nations.

- **Five Focus Areas Under POCC:**
  - **Digital technologies for culture:** Using AI, AR/VR to share heritage and art.
  - **Exhibitions and collections:** Collaborations between museums and galleries.
  - **Performances and events:** Joint cultural festivals, theatre, and music.
  - **Cultural property:** Heritage conservation and responsible cultural exchange.
  - **Sustainability:** Supporting eco-friendly cultural practices and artisanship.

Recent development in cultural Cooperation:

- **High-Level Engagement at WAVES Summit**
  - Lisa Nandy, the highest international delegate, participated in the World Audio Visual & Entertainment Summit in Mumbai.
  - She emphasized how India-U.K. cooperation can transform global creative industries.
- **Partnerships with British Institutions:** British Library, British Museum, Natural History Museum, and others are exploring digital and curatorial partnerships with Indian counterparts.
  - Over 1,700 U.K. museums offer vast scope for bilateral collaboration.
- **Corporate Participation in Cultural Preservation**
  - Example: Royal Enfield and UNESCO's **Himalayan Knot** project preserves Himalayan textile traditions and supports 580+ artisans.
  - Business-led storytelling is emerging as a powerful mode of cultural engagement.

Significance of the Cultural Cooperation

- **Strengthening the Creative Economy:** The global creative sector is projected to contribute **10% to global GDP by 2030**.
  - India's creative economy is valued at **$35 billion**, employing **8% of the workforce**, second only to agriculture.
- **Deepening India-U.K. Cultural Ties:** Moves beyond trade and politics to shared values, traditions, and creativity.
  - Programmes like **Wales in India**, culminating in the 2024 **Hornbill Festival**, show commitment to long-term cultural exchange.
- **Empowering Non-Metro Creative Hubs:** 6 of India's top 10 creative hubs (e.g., Badgam, Tiruppur) are in non-metros, according to ADB.
  - Cultural cooperation ensures visibility and support for these regions.
- **Tapping Youth Potential:** With over **300 universities and 3,000 colleges** offering arts/design courses, India is grooming a global creative workforce.
  - The POCC can offer them global exposure and skills.
- **Technology-Driven Culture:** AI, AR/VR, and gaming are reshaping how culture is produced and consumed.
  - Integration into India's education and creative industries is crucial for future competitiveness.

What Is the Way Ahead?

- **Invest in Creative Education and Training:** Establish skill development and vocational training for youth in creative fields.
  - International collaborations can introduce best practices and global standards.
- **Integrate Emerging Technologies:** Embed **AI, AR/VR, immersive tech** into cultural education and exhibitions.
  - Enable museums and institutions to digitally archive and share experiences globally.
- **Promote Inclusive and Regional Growth:** Ensure support to non-metro and tribal creative hubs.
  - Provide funding and infrastructure for local artisans to access global markets.
- **Foster Public-Private Partnerships:** Encourage companies like Royal Enfield to lead cultural sustainability projects.
  - Incentivize CSR funding for heritage and creative economy ventures.
- **Strengthen Tripartite Collaboration:** Governments, academic institutions, and industries must jointly design policies and programmes.
  - Multilateral platforms (e.g., G-20) should institutionalize creative economy discussions.
- **Institutionalize Cultural Diplomacy:** Expand the POCC model with other partner countries.
  - Establish long-term exchange programmes, co-productions, artist residencies, and academic tie-ups.

South Asian economic integration

Syllabus Mapping: GS-2 Neighbourhood of India

Context

Recent two major incidents, the reciprocal tariffs imposed by the Trump administration and the terror attack in Pahalgam which shook India's economic and national security landscape, highlight the urgent need for India to have a regional approach to economic and security stability.

South Asian Countries and its potential

- **Countries:** The region includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka (collectively forming SAARC).
- **Population:** Accounts for **about 25% of the global population**.
- **Combined GDP:** Approximately **$5 trillion**, much lower than other major economic blocs.

Potential of South Asia

- **High Growth:** Since the 1990s, the region has registered an **annual average output growth of 6 per cent**. This remarkable economic growth has contributed to declining poverty incidence and improvements in other socio-economic indicators.
- **Large Untapped Market:** According to a United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) study, estimated that South Asia's potential trade could reach **$172 billion** (2020), while actual intra-regional trade is only about **$23 billion**.
- **Trade Growth:** Despite growth in total trade value ($1,335 billion between 2015-2022), **intra-regional trade forms just 5–7%** of total international trade—the lowest among global blocs.
- **Demographic Dividend:** Over **60% of the region's population** is below the age of 30, offering a huge workforce if adequately skilled.
- **Expanding Middle Class:** Rising incomes are creating new consumer markets, especially in India, Bangladesh, and Sri Lanka.
- **Strategic Location:** South Asia bridges Central Asia, Southeast Asia, and the Indian Ocean, making it a **natural trade and transit hub.**
  - **E.g.** Initiatives like the India-Nepal railway, BBIN Motor Vehicle Agreement, and Chabahar Port have strategic implications.
- **Environmental Resilience:** Regional Cooperation Needed for disaster preparedness, resource management, and green transition.
  - **E.g.** Floods, cyclones, and droughts regularly impact all South Asian countries.

Why regional approach is necessary?

- **Buffer Global shocks:** A regional supply chain and trade diversification strategy could help in handling **U.S. tariffs and geopolitical disruptions (e.g., in the Red Sea, or Ukraine).**
  - Eg. It will Reduce dependence on Western markets, promote regional value chains and industrial corridors and build resilience against global economic volatility.
- **Shared Security Challenges:** Terrorism, cross-border militancy, and insurgencies affect nearly all South Asian states.
  - **E.g.** a cooperative regional security mechanism could enable **joint intelligence-sharing platforms** and build **common counterterrorism doctrines** sensitive to each country's internal dynamics.
- **Climate Vulnerabilities:** South Asia is one of the most climate-vulnerable regions.
  - **E.g.** Regional collaboration in disaster response, water management, and renewable energy **(e.g., a shared solar grid)** is urgently needed.
  - Joint platforms for **managing cross-border rivers** (e.g., Ganges, Brahmaputra) could mitigate water conflicts.

- **Unblocking trade potential:**
  - **Increased intra-regional trade** can unlock billions in untapped economic activity.
    - Trade-driven development (in e.g., Kashmir, Balochistan, North-East India) can create livelihoods and reduce the appeal of insurgency.
  - **Boosting exports and imports** between neighboring countries supports small businesses, farmers, and manufacturers.
  - **Job creation** through trade-intensive sectors like textiles, agriculture, and logistics can help absorb South Asia's large, young workforce.
  - Economic marginalisation, especially among youth, often fuels **radicalisation and recruitment by extremist groups**.
- **Dealing in shared challenges:**
  - **Food security:** Trade can help balance seasonal food shortages and surpluses across borders.
  - **Energy security:** Regional energy trade (e.g., hydroelectricity from Bhutan and Nepal) can reduce dependence on costly imports and fossil fuels.

Issues Hindering South Asia's Potential

- **High Trade Costs:** Intraregional trade costs are **114% of goods' value**, higher than trade with distant partners like the US (109%).
- **Political Tensions:** Border disputes, lack of trust, and terrorism disrupt trade and regional cooperation.
- **Inefficient Mechanisms:** Trade agreements like SAFTA exist, but poor implementation and persistent conflicts limit their impact.
- **Declining Trade Ratios:** Trade-to-GDP ratio fell from **47.3% (2022)** to **42.94% (2024)**.
- **Widening Deficits:** Regional trade deficit increased from **$204.1 billion (2015)** to **$339 billion (2022)**.
- **Declining Bilateral Trade:** India-Pakistan trade fell from **$2.41 billion (2018)** to **$1.2 billion (2024)**.

Regional Forums in South Asia

- **SAARC (South Asian Association for Regional Cooperation):** Principal regional organization, aims to promote economic and regional integration.
  - **SAFTA (South Asian Free Trade Area):** Trade agreement under SAARC for reducing tariffs and barriers, though implementation is weak.
- **BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation):** Connects South Asia with Southeast Asia.

Way Forward

- **Prioritize Regional Cooperation:** Depoliticize trade by keeping economic cooperation above bilateral disputes.
- **Lower Trade Barriers:** Simplify customs, harmonize standards, and implement SAFTA provisions effectively.
- **Build Trust:** Encourage dialogue, conflict resolution, and people-to-people connections to reduce mistrust.
- **Enhance Connectivity:** Invest in cross-border infrastructure, logistics, and digital links to reduce trade costs.
- **Promote Regional Value Chains:** Foster complementary industries to strengthen regional supply chains.
- **Leverage Services and Investment:** Tap into the potential for trade in services and cross-border investments.
- **Strengthen Regional Institutions:** Reform and empower SAARC and related bodies for more effective governance.

Advancement in Defence Technologies: Future of Conflicts

Syllabus Mapping: GS-3 Security Forces

Context

From **Operation Sindoor's surgical strikes** to **Spider's Web's strategic drone incursions**, the nature of warfare is evolving.

Advancements in Warfare Technology

- **Precision-Guided Munitions (PGMs):** Enabled targeted, surgical strikes (e.g., Operation Sindoor) with reduced troop deployment and civilian casualties.
- **Drones and Loitering Munitions:** Used extensively in Ukraine-Russia war and in Operation Spider's Web. Applications include surveillance, strikes, artillery spotting, and logistics.
- **First Person View (FPV) Drones:** Low-cost, highly accurate, and operator-guided for real-time engagement. They turn a 20–30 km battlefront into a high-risk zone.

- **AI and Robotics Integration:** AI-enhanced surveillance, battle management systems, and autonomous drones are becoming crucial force multipliers.
  - **E.g.** AI applications like the **Indrajaal autonomous drone security system** have been developed.
  - **E.g.** AI is also being integrated into autonomous underwater vehicles for tasks like submarine detection, mine detection, and surveillance et
- **Counter-Drone Measures and Fortification:** Increased use of jammers, fibre-optic guided drones, and underground bunkers point to new defensive doctrines.
- **Internet of Military Things (IoMT):** It refers to the network of interconnected sensors, devices, and systems used in military operations to enhance situational awareness, improve decision-making, and increase operational efficiency.
  - **E.g.** It enhances situational awareness by connecting various components, such as soldiers, **military** vehicles, ships, tanks, aircrafts etc

Arguments For Technological Warfare

- **Reduced Casualties:** Stand-off weapons and drones limit the need for mass troop deployments.
- **High Precision and Strategic Reach:** Deep-strike capability without escalation or territorial compromise.
- **Cost Efficiency:** Low-cost drones (e.g., FPVs) deliver strategic impact comparable to expensive traditional weapons.
- **Force Multiplier Effect:** Enhances the effectiveness of combined arms operations.

Arguments Against Over-Reliance on Technology

- **Loss of Ground Control:** Drones can strike but not hold territory or engage with civilian populations in conflict zones.
- **Vulnerability in Harsh Terrains:** In places like Siachen or Eastern Ladakh, drones often fail due to extreme weather.
- **Countermeasures Are Evolving:** Jamming, decoys, and dispersion reduce drone effectiveness.
- **Moral and Legal Ambiguities:** Autonomous weapons raise ethical questions about decision-making in lethal engagements.
- **Technological Dependence:** Heavy reliance may lead to paralysis in the face of system failures or cyberattacks.

Way Forward

- **Integrated Force Doctrine:** Combine traditional arms (infantry, armour) with technological assets for holistic operations.
- **Modernisation of Ground Forces:** Equip infantry with UAV support, secure comms, anti-drone tools, and battlefield management systems.
- **Training and Restructuring:** Embed drone operators at platoon level; emphasize small-unit tactics and adaptability.
- **Infrastructure and Indigenous Development:** Develop India's own drone and AI ecosystems under Make in India and iDEX schemes.
- **Ethical and Strategic Frameworks:** Formulate clear rules for autonomous weapons under international law.

Conclusion

From **Operation Sindoor's surgical strikes** to **Spider's Web's strategic drone incursions**, the nature of warfare is evolving — but not its essence. **Technological superiority must complement, not replace, the physical presence and human judgment of ground forces.** The future of conflict lies in convergence — where smart machines amplify the strategic capabilities of smart soldiers.

The case for an India-led bloc against terrorism

Syllabus Mapping: GS-2 Terrorism

Context

Western-dominated counter-terrorism institutions are proving ineffective against the continuing threat of state-sponsored terrorism, particularly from Pakistani groups, therefore India introduced a novel **"T20" (Twenty Against Terrorism)** coalition.

About T20 – Twenty Against Terrorism

- It is a **proposed India-led international coalition** comprising 20 countries from the **Global South**, designed specifically to confront terrorism comprehensively, proactively, and effectively.
- **Objective:**
  - Address frequent, asymmetrical, and politically complex terror threats common in developing countries.
  - Act as a dedicated global platform representing nations consistently impacted by terrorism.

- **Potential Members:** Countries facing frequent terror threats, including India, Indonesia, Nigeria, Kenya, Egypt, Mali, Fiji, Philippines, Ethiopia, Kazakhstan, Sri Lanka, and Vietnam.
- **Core Functions:**
  - Intelligence sharing through joint task forces.
  - Capacity building, counter-radicalisation programmes, and collaborative training.
  - Joint diplomatic initiatives to name and shame terror sponsors.
  - Address emerging threats: cyber-terrorism, drone warfare, crypto-financed extremism.
  - Foster resilience through development-linked de-radicalisation.

Why it is important?

- **Complex diplomatic terrain:** India lacked unified support against Pahalgam terror attack.
  - **E.g.** Countries like the United States, France, and Israel supported India, However China shielded Pakistan diplomatically. Russia remained silent
- **Issue in the counter-terrorism architecture:** lack of teeth, geopolitical rivalries or western led that do not reflect the realities of terrorism in South Asia, Africa, or the Middle East.
  - **E.g.** UN, the Financial Action Task Force (FATF), and the Global Counterterrorism Forum
- **Minilateral approach:** T20 will provide a specific platform for more frequent victims of terror(Global South). As multilateralism falters under the weight of big-power rivalries, smaller groupings are proving more nimble and effective.
  - **E.g.** Quad, I2U2, or ASEAN-led security platforms.
- **Focus on inclusivity:** It would bring in countries often left on the sidelines of global security debates.
  - **E.g.** Countries like Ethiopia, Kazakhstan, Sri Lanka, and Vietnam faced terrorism but neglected

How T20 is Different from Existing Groupings?

Feature	Existing Platforms (UN, FATF, GCTF)	T20 – Twenty Against Terrorism
Membership Composition	Dominated by major powers, largely Western-centric.	Exclusively Global South, countries directly facing terror regularly.
Operational Focus	Often reactive, bureaucratic, politically influenced.	Proactive, agile, operationally swift, tailored to regional realities.
Decision-Making	Influenced by geopolitical rivalries, leading to diluted actions.	Unified by shared experience, collective action, swift consensus.
Security Paradigm	Western security frameworks, episodic attack response.	Continuously addressing terror as a persistent security challenge.
Mandate Clarity	Broad, diffuse mandates often lacking actionable clarity.	Specific, clear, practical mandate: intelligence sharing, resilience-building, real-time coordination.
Diplomatic Approach	Tends towards diplomatic caution and neutrality.	Willing to publicly identify, condemn, and diplomatically isolate state sponsors of terrorism.
Response Speed	Slower response times due to procedural constraints.	Quick, coordinated responses due to streamlined, collaborative mechanisms.
Inclusivity & Relevance	Often excludes countries disproportionately affected by terrorism.	Prioritizes inclusion, giving voice and platform to affected nations usually marginalised in global forums.

Strategic Significance for India

- **Leadership Without Military Baggage:** Positions India as a global leader in counter-terrorism without military entanglements or perceived interventionism.
- **Strengthens India's Global South Credentials:** Reinforces India's image as a responsible global actor that champions collective interests of developing nations.
- **Enhances Diplomatic Clout:** India gains diplomatic leverage in international security debates, influencing narratives on terrorism.
- **Operational Advantages:** India can leverage its extensive experience dealing with cross-border terrorism and digital capacities to effectively lead and host T20's secretariat, training hubs, and information centres.

Conclusion

T20 – Twenty Against Terrorism offers a targeted and innovative approach to global counter-terrorism, significantly distinct from existing platforms. By focusing on the unique and sustained challenges faced by the Global South, it fills critical gaps in global counter-terrorism architecture, placing India at the forefront of a vital global initiative.

TOPICS FOR PRELIMS

Central American Integration System (SICA)

Context

The Ministry of External Affairs (MEA) organised a virtual dialogue between India and SICA countries.

Highlights of the Meeting:

- India reaffirmed its commitment to supporting the region through its development partnership initiatives i.e. the Indian Technical and Economic Cooperation (ITEC) programme, Quick Impact Projects (QIPs), and a dedicated SME grant programme.
- India to collaborate with SICA in areas such as digital transformation, affordable healthcare, disaster resilience, and renewable energy, underscoring India's success in these fields.

About Central American Integration System (SICA)

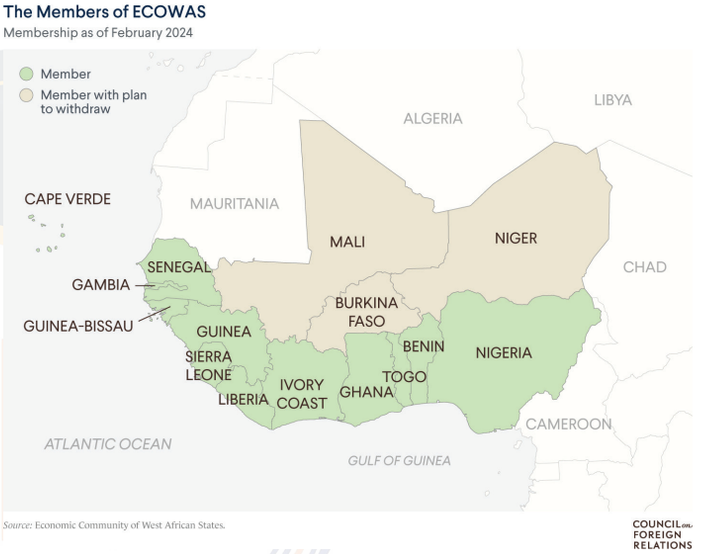
- It is an institutional **regional integration framework** in Central American Isthmus region.

- **Aim:** Enable the Isthmus of Central America region to become a region of peace, freedom, democracy and development.
- **Establishment**: December **1991** by the signing of the **Protocol to the Charter of Organisation of the Central American States (ODECA) or Tegucigalpa Protocol.**
- **Current members: 8 countries** of Central Asia – Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Belize, Dominican Republic
- **Secretariat:** El Salvador.
- **Presidency**: Presidency of SICA rotates every six months.
- **Summits**: Held twice a year.

Economic Community of West African States (ECOWAS)

Context

A recent survey reveals that over half of Togolese support leaving ECOWAS to join the Sahel States Alliance.



Key Highlights of Survey:

- 54% of Togolese consider the presence of Russia (or the Wagner Group, now known as Africa Corps) in the Alliance of Sahel States to be beneficial.
- Ecowas, which many Togolese now see as out of touch with the region's realities.

About ECOWAS

- **Founded:** 1975 (Treaty of Lagos)
- **Mission:** Foster economic integration among member states
- **Vision:** Seamless region with democratic governance, rule of law, and effective governance
- Citizens of ECOWAS countries have the **right to live and work in all member states**, along with free circulation of goods.
- **Objectives:**
  - To achieve "collective self-sufficiency" for its member states by creating a single large trade bloc.
  - To raise living standards and promote economic development.

  - To have a **single common currency**
- **Members:** 12 after **Mali, Niger, Burkina Faso** left ECOWAS and formed the Alliance of Sahel States.
  - **Reason For withdrawal:**
- **Strained relation:** Relations between Ecowas and the three Sahel countries have been tense since the military seized power in Niger in 2023, Burkina Faso in 2022 and Mali in 2020.
- **Geopolitical reason:** The three countries accuse Ecowas of being too close to Western powers and have instead pivoted towards Russia.
- **Against the military Rule:** ECOWAS countries voiced against the military rule in the three countries and they support the democratic setup in these countries which is opposed by the military rule.
- **Conflict Resolution**: Aims to resolve regional military conflicts
  - Managed Economic Community of West African States Monitoring Group (ECOMOG) peacekeeping force (led by Nigeria in 1990s-2000s)
- **Headquarters:** Abuja, Nigeria.

Sahel States?

- The three countries— **Mali, Burkina Faso, and Niger**— formed the **Alliance of Sahel States (AES)** to seek **military support from Russia** while distancing themselves from the influence of the US and France.
- The **Sahel** is a **semi-arid region** in western and north-central Africa, serving as a transitional zone between the **Sahara Desert** to the north and the **humid savannas** to the south.

UNSC

Context

On June 2025, the UN General Assembly elected five countries as non-permanent members of the UN Security Council (UNSC) for the 2026–2027 term – Bahrain, Colombia, Democratic Republic of Congo, Latvia, And Liberia

- These will replace outgoing members: Algeria, Guyana, Sierra Leone, Slovenia, and South Korea (from January 1, 2026).

About UNSC

- **Total Members**: 15
  - **5 permanent** (P5): China, France, Russia, UK, USA
  - **10 non-permanent**: Elected for **2 years**, no immediate re-election.
- **Functions**:
  - Maintains **international peace & security**
  - Can impose **sanctions**, authorize **military action**, establish **peacekeeping missions**
- **Voting**:
  - For procedural matters: **9/15** votes required
  - For substantive matters: **9/15, including all 5 permanent members** (P5 have **veto power**)
- Election Process for Non-Permanent Members:
  - Elected by **UN General Assembly** (2/3 majority).
  - Seats are allocated by **regional groups**:
    - Africa – 3
    - Asia-Pacific – 2
    - Latin America & Caribbean – 2
    - Western Europe & Others – 2
    - Eastern Europe – 1

Permanent Membership for India

- India has been a member of the United Nations Security Council (UNSC) multiple times as a non-permanent member.
- India is part of the G4 nations (with Brazil, Germany, and Japan) advocating for UNSC reform to become a permanent member.
- India has broad international support (including from the U.S., France, Russia, and others) but faces opposition from some countries (e.g., China, Pakistan).

International Institute of Administrative Sciences (IIAS)

Context

India won the IIAS Presidency for 2025-2028.

About IIAS

- **Establishment:** 1930.
- **Headquarters:** Brussels, Belgium.
- **Objective:** Promotes scientific research and collaboration in public administration globally.
- IIAS is not a formally affiliated body of the United Nations, However it actively engages with the UN's work in the field of public administration.
- **Membership:**
  - 31 member countries (including India, Japan, China, Germany, etc.).
  - 20 national sections.
  - 15 academic research centres.
- **India's Association:**
  - Member since 1998.
  - Represented by the Department of Administrative Reforms and Public Grievances (DARPG).

IIAS
International Institute of Administrative Sciences

Recent Context (2025-2028 Term):

- India won the IIAS Presidency for 2025-2028.
- **Candidate:** V. Srinivas (Secretary, DARPG), nominated by PM Narendra Modi.
- **Election Process:**
  - Held on June 3, 2025, at Bharat Mandapam, New Delhi.
  - Competed with Austria, South Africa, and Bahrain; India won in the final round against Austria.

G7 Summit

Context

India was invited for the 12th time for participation in the G7 summit in Canada.

Why this invitation is important:

- India's presence at G7 summit reflection of **India's global leadership**
- Host country invites the guest country based on **current global priorities, strategic partnerships, and regional representation.**
- Invitation by Canada signals the new government's intent to **repair the ties with India**
  - **Earlier Canada's PM Trudeau** accused India of involvement in a Khalistani separatist's killing (2023). **India in response** Denied allegations and diplomatic ties strained. Canada pushed to exclude India in 2024 **G7 Impact** but host Italy invited India as a partner.
- Both have strong trade relation with US, however tariff war of Trump provides opportunity to strengthen trade relation between India and Canada which was mere **$12 billion in 2024.**
- Both countries agreed to **designate new High commissioners** to each other's capital to provide service to citizen and business.

Outcome of 51st G7 Summit (2025) Summit

Critical minerals supply chain:

- Launched the G7 Critical Minerals Action Plan. It will focus on diversifying the responsible production and supply of critical minerals, encouraging investments in critical mineral projects and local value creation, and promoting innovation.
- It was endorsed by India, Australia and Korea as well.

AI for Prosperity:

- AI for public sector: G7 launched **"G7 GovAI Grand Challenge"** and will host a series of "Rapid Solution Labs" to develop innovative and scalable solutions for adopting AI in the public sector.
- It will establish **a G7 AI Network (GAIN**) to advance the Grand Challenge

Quantum Technology:

- Promote **public and private investment** in quantum science and technology
- Promote the development and adoption of beneficial applications of quantum technologies
- Collaborate through a **G7 Joint Working Group on Quantum Technologies**, with industry, experts and academia to inform cooperation on research, development and commercialization

Wildfire resilience: endorsement of the **Kananaskis Wildfire Charter** by the Leaders of Australia, India, Mexico, the Republic of Korea, and South Africa.

G7 Condemned Transnational Repression (TNR): It includes physical violence such as harassment, assault, Digital transnational repression, such as doxing and sexualized smear campaigns particularly targeting women and Misuse of spyware and cyber tools

Commit to Prevent migrant smuggling: Through the G7 Coalition to Prevent and Counter the Smuggling of Migrants.

Measures announced by Canada for the support of Ukraine :

- $2 billion in military assistance, sanction against individuals, entities, and vessels that continue to support Russia's aggression in Ukraine

Iran-Israel war:

- Joint statement defined Iran as the principal source of regional instability and terror, and stressed that Iran could never have a nuclear weapon.

Side meetings outcome:

- US-UK: Prime Minister Starmer and President Trump signed a UK–US trade deal.
- EU and Australia: agreed to start negotiations on a security and defence partnership (SDP), and stressed their renewed engagement to conclude an Australia–EU free trade agreement.

About G7

- **Full Form**: **Group of Seven (G7)**.
- **Members**:
  - **Canada, France, Germany, Italy, Japan, UK, USA** (7 nations).
  - **European Union (EU)** participates as a non-enumerated member.
- **Type**: **Informal forum** of advanced economies (no permanent secretariat).
- **Origin**: Formed in **1975** as G6 (Canada joined in 1976 → G7).
- **Russia as Member:** 1998–2014: Russia joined to form the G8, but was removed post-Crimea annexation, signalling a return to G7's democratic alignment.
- **Purpose**: Discuss global issues like **economy, security, climate, and technology**.
- **Function:**
  - **Macroeconomic stability:** It acts as a platform for the world's advanced economies to stabilize markets, reduce inflation, and ensure fiscal discipline
  - **Promotes liberal democratic values:** e.g. gender equity, and sustainable development across partner countries.

Parliamentary Forum of BRICS Condems Terror in Pahalgam

Context

The **BRICS Parliamentary Forum** condemned the Pahalgam terror attack and pledged collective action against terrorism.

BRICS Parliamentary Forum

- **Established:** The first BRICS Parliamentary Forum was held in 2015, as a parallel institution to the BRICS summits
- **Functions:**
  - Encourages parliamentary diplomacy and alignment on global policy issues.
  - Promotes democratic dialogue, cooperation in lawmaking, and consensus on global peace and security.
  - Acts as a voice for the Global South in parliamentary affairs.

11th BRICS Parliamentary Forum

- It was held in Brasilia, Brazil.
- It saw participation from the parliaments of all 10 member countries, including India
- Ten BRICS countries participated : India, Brazil, Russia, China, South Africa, Iran, the United Arab Emirates, Egypt, Ethiopia, and Indonesia.
- India was entrusted with hosting the 12th BRICS Parliamentary Forum next year

About BRICS

- The term "**BRIC**" was first introduced in 2001 by **Goldman Sachs**,
  - Acronym for Founding Members – Brazil, Russia, India, and China.
- **Current Members**: 11.
  - **South Africa** joined in **2010**, transforming **BRIC into BRICS**.
  - **2024**: Egypt, Ethiopia, Iran, and the UAE as full members from January 1, 2024.
  - **January 2025: Indonesia became a full member** and countries like Belarus, Bolivia, Kazakhstan, Cuba, Malaysia, Nigeria, Thailand, Uganda, and Uzbekistan were inducted as partner countries.
- Collectively, these nations represent approximately 49.5% of the global population, around 40% of the global GDP, and about 26% of global trade.
- **Summits:**
- **1st BRIC Summit (2009):** Yekaterinburg, Russia
- **Most Recent**:
  - **16th Summit 2024:** Kazan, Russia.
  - **15th Summit (2023):** Johannesburg, South Africa.
- **Chairship:** Rotates annually among Brazil, Russia, India, China, And South Africa.
  - **2025**: **Brazil**

UNFPA

Context

A new UN report titled "State of the World Population 2025: The Real Fertility Crisis" releases.

Key Highlights of Report

- **India's population has reached 146.39 crore** as of April 2025, making it the **most populous country** in the world.
- **India's Total Fertility Rate (TFR)** has **declined to 1.9**, which is **below the replacement level of 2.1**, signaling a long-term demographic shift.
- The population is **expected to peak at 170 crore** before beginning to decline in around 40 years.
- The report emphasizes a **"real fertility crisis"** where **millions are unable to realize their reproductive goals**, not just due to overpopulation or underpopulation.
- **68% of India's population is in the working-age group** (15–64 years), presenting both an opportunity and challenge for policymakers.

United Nations Population Fund (UNFPA)

- **Founded:** 1967 (as a trust fund), operational from 1969.
- **Renamed:** From UN Fund for Population Activities to UN Population Fund in 1987.
- **Type:** Subsidiary organ of the UN General Assembly.
- **Motto: "Ensuring rights and choices for all."**
- **Mission:** Deliver a world where every pregnancy is wanted, childbirth is safe, and every young person's potential is fulfilled.
- **Focus Areas:** Reproductive health, family planning, maternal health, gender equality.
- **Key Goals by 2030 (Three Zeros)**
  - **Zero unmet need for family planning**
  - **Zero preventable maternal deaths**
  - **Zero gender-based violence and harmful practices** (like child marriage, FGM)
- **Global & Country-Level Work:**
  - Active in over 150 countries.
  - Supports national planning and integrates population-health-gender data into policy.
  - Publishes the **State of World Population Report** annually.
  - Partners with governments, CSOs, and youth groups.
- **Awards and Days:** UN Population Award, World Population Day (11 July).

United Nations Ocean Conference (UNOC)

Context

The 2025 UN Ocean Conference was held in Nice, France.

Key Achievements at the 2025 UNOC (France)

It saw over 800 voluntary commitments by 170+ countries called as "**Nice Ocean Action Plan".** Political Declaration titled "Our Ocean, Our Future: United for Urgent Action"

- **30% ocean protection by 2030 reaffirmed** under the **Kunming-Montreal Biodiversity Framework**
- **56 out of 60 ratifications** secured for the **BBNJ Treaty.**
- **European Commission**: €1 billion for ocean conservation, science, and sustainable fishing.
- **French Polynesia**: Announced the world's largest MPA (5 million sq. km).
- **New Zealand**: $52 million for ocean governance in Pacific Islands.

- **Germany**: €100 million for clearing wartime munitions in the Baltic and North Seas.
- **Panama & Canada-led Coalition**: Launched the **High Ambition Coalition for a Quiet Ocean** to address ocean noise pollution. It was supported by **35 other nations**
- **Italy**: €6.5 million to boost marine surveillance.
- **Canada**: $9 million to build climate resilience in small island and coastal nations
- **Spain**:Announced five new MPAs to protect 25% of its marine areas.
- **UN Agencies**: Launched **One Ocean Finance** to unlock funding for the blue economy
- **Coral Bond** by Indonesia & World Bank to finance reef restoration

About UNOC

- A global platform to accelerate action for ocean protection and sustainable use of marine resources.
- Focuses on establishing **marine protected areas (MPAs)** in international waters, reducing overfishing, preventing deep-sea mining, and advancing SDG 14 (Life Below Water).
- The third edition was recently held in **France**. It was built on past UNOC events in **New York (2017) and Lisbon (2022)**

About BBNJ (Biodiversity Beyond National Jurisdiction)

- Also known as the **High Seas Treaty**.
- Aims to conserve and sustainably use marine biodiversity in **areas beyond national jurisdiction** (the high seas).
- Addresses four main areas:
  - **Marine Protected Areas**
  - **Environmental Impact Assessments**
  - **Marine Genetic Resources and Benefit Sharing**
  - **Capacity-building and technology transfer**
- Needs **60 ratifications** to become legally binding; **56 countries** have ratified so far (India and U.S. yet to ratify).

Fourth International Conference on Financing for Development

Context

UN Member States have reached agreement on the outcome document for the **Fourth International Conference on Financing for Development**, to be formally adopted at an upcoming **summit in Sevilla, Spain.**

More in News

- Serves as a **foundation for a renewed global framework** to finance sustainable development goals (SDGs).
- The **United States opted out** of the FFD4 process entirely.

Key Dimensions of the FFD4 Outcome Document

- **Global Financing Framework:** Reaffirms commitments made under earlier FFD conferences to mobilize financing for sustainable development.
- **International Financial Architecture Reform:** Urges for **inclusive governance** reforms:
  - **IMF quota realignment**
  - **World Bank shareholding review**
- **Debt Sustainability:** UN to **lead a coalition** (with IMF and World Bank) to propose **voluntary principles for responsible sovereign debt management**.
- **Tax Reform:** Acknowledges implementation of **Pillar II** under the **OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS)**.
  - Emphasizes:
    - **Minimum global corporate tax** for multinationals in all jurisdictions.
    - **Country-specific technical support** to implement:
- Global Anti-Base Erosion (GloBE) Model Rules
- Subject to Tax Rule (STTR)
- **Closing the SDG Financing Gap:** Targets narrowing the **$4 trillion annual shortfall** in SDG financing in developing countries.

About the FFD Process

A **UN-led initiative** that builds on the outcomes of three earlier conferences:

- **Monterrey Consensus (2002):** Marked the **first global agreement on development financing**.
  - Emphasized increasing **Official Development Assistance (ODA).**
  - Stressed aid effectiveness, referencing the **Paris Declaration.**
  - Called for **IMF governance reforms** and **promoted innovative financing methods.**
- **Doha Declaration (2008): Reaffirmed the commitments of Monterrey,** especially during the 2008 global financial crisis.
  - Introduced aspects like **gender-sensitive financing.**
  - Added emphasis on climate finance, including support for the **Green Climate Fund.**
- **Addis Ababa Action Agenda (2015):** Closely aligned with the **Sustainable Development Goals (SDGs)**.
  - Introduced **Integrated National Financing Frameworks (INFFs)**.
    - INFFs are country-led and country-owned tools.
    - Help governments plan, implement, and align financing with sustainable development priorities.

Asian Development Bank

Context

- Pakistan took a **$350 million loan** from the **Asian Development Bank** to support **women's financial inclusion**. Its **total debt has reached PRs 76,000 billion** in nine months.
- **ADB has withdrawn a $434.25 million loan for Assam's 1000 MW Solar Power Park** following protests over tribal land acquisition in Karbi Anglong. **It was asked by**

Union Finance Ministry, at the request of the Assam government to cancel the loan

Asian Development Bank (ADB)

- Established on **19th December 1966**.
- A **multilateral development bank** for the **Asia-Pacific** region.
- Aims for a **prosperous, inclusive, resilient, and sustainable** Asia and the Pacific.
- Committed to **eradicating extreme poverty** in the region.
- **Headquarters**: Manila, Philippines.
- **Membership:** Started with **31 members**, now has **69 members**:
  - **49 regional members** (Asia & Pacific): India, China, Japan, South Korea, Australia, etc.
  - **20 non-regional members**: Europe, North America, and others.
  - Open to **UNESCAP members**, other **regional** and **non-regional UN members**.
- **Functions:** Provides support via– Loans, Grants, Technical Assistance, Equity Investments.
  - **Supports**: Governments, Private Sector, Public-Private Partnerships
  - **Promotes**: Social and economic development
- **Governance:**
  - Governed by a **Board of Governors** (one per member country)
  - Board elects **12-member Board of Directors**:
    - **8 from regional** members (Asia-Pacific)
    - **4 from non-regional** members
  - **President** is elected for a **5-year term**, chairs the Board, and runs the Bank.
  - **All ADB Presidents have been Japanese** (Japan is founding and largest shareholder).
- **Voting Power:** Uses a **weighted voting system** (like the World Bank)
  - Voting power is based on **capital subscriptions**
  - **Top 5 Shareholders**:
    - **Japan** – 15.6%
    - **USA** – 15.6%
    - **China** – 6.4%
    - **India** – 6.3%
    - **Australia** – 5.8%
- **Source of Funding:** Raises capital via **international bond markets**
  - Also funded by:
    - Member contributions
    - Loan repayments
    - Retained earnings

Partnership for Indo-Pacific Industrial Resilience (PIPIR)

- During his Keynote Address at the Shangri-La Dialogue in Singapore on May 31, 2025, U.S Secretary Hegseth endorsed PIPIR and announced two marquee projects under this initiative.
- New initiatives:
  - development of **standards for small unmanned aerial systems** across the Indo-Pacific and
  - expands the **sustainment capability of the P-8 AN/APY-10 radar system** to Australia.

About PIPIR

- **Established in:** May 2024
- **Comprises of:** 14-nation from Indo-Pacific and Euro-Atlantic partners.
- **Aim:**
  - **strengthen collective ability to produce and sustain warfighting capability** in the Indo-Pacific
  - aimed at **strengthening defense industrial resilience** to promote continued regional security, economic security, and prosperity in the Indo-Pacific region.
  - It serves as a **platform to accelerate defense industrial base (DIB)** cooperation by reducing barriers to production.
- **Led by:** U.S. Department of Defense.

Treaty on Eternal Good Neighbourliness, Friendship and Cooperation

A "Treaty on Eternal Good Neighbourliness, Friendship and Cooperation" was signed during **2nd China–Central Asia Summit** in Astana, Kazakhstan.

About the treaty

- **Countries Involved**: China, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.
- The treaty formalizes a long-term pledge to **never use force** against each other, and to resolve disputes peacefully.
- China will provide a 1.5 billion yuan (US$208 million) grant this year to support key projects aimed at enhancing public welfare.
- China consistently takes Central Asia as a priority in its neighborhood diplomacy.

First China-Central Asia summit held in Xi'an in 2023 Since then the trade between China and Central Asian countries has surged by 35%, reaching a historic high of nearly $100 billion last year.

United Nations Economic and Social Council (ECOSOC)

- India has been elected to the United Nations Economic and Social Council (ECOSOC) for the 2026–28 term.

About ECOSOC:

- It is one of the six main organs of the United Nations.
- **Establishment:** The UN Charter established ECOSOC in 1945.
- **Headquarter:** New York (USA)
- **Function:**
  - It deals with e**conomic, social, cultural and health matters** as well as human rights and fundamental freedoms.
  - It also **coordinates the work of the UN** and the specialized agencies functional commissions and regional commissions.
  - **Policy Recommendation:** It receives reports from nine UN funds and programmes and issues policy recommendations to the UN system and to Member States.
  - ECOSOC's purview extends over **70 per cent of the human and financial resources** of the entire UN system.
- **Membership and election:**
  - **Consists of 54 members**, 18 of which are elected each year by the General Assembly for a three-year term.
  - It is **distributed across 5 regional groups**: Africa, Asia-Pacific, Eastern European, Latin American & Caribbean, and Western European and other States.
- **In the recent election**, India was elected in the Asia-Pacific States category (it has 4 seats) along with Lebanon, Turkmenistan, China.

4th India-Central Asia Dialogue

- India hosted the 4th India-Central Asia Dialogue in New Delhi under the chairmanship of EAM Dr. S. Jaishankar.

Joint Statement of 4th India-Central Asia Dialogue

- **Fight against terror:** unequivocally condemned the terrorist attack in Pahalgam. They called for early adoption of the **UN Comprehensive Convention on International Terrorism.**
- **Critical minerals:** joint exploration of rare earth and critical minerals. (first India-Central Asia Rare Earth Forum held in September 2024 in New Delhi)
- **South South Cooperation: Agreed to** work closely with India's Global South Centre of Excellence "DAKSHIN" (Development and Knowledge Sharing Initiative)
- **Connectivity:**
  - optimum usage of the International North-South Transport Corridor (INSTC) to enhance connectivity
  - India welcomed the interest of Central Asian countries to utilize the services of Shahid Beheshti Terminal at the Chabahar Port
  - streamline customs via TIR Convention for smooth transit.
- Welcomed **India-Central Asia Business Council (ICABC), as a B-2-B body** under the India-Central Asia Dialogue, to promote business linkages
- Ministers welcomed the designation of 2025 as the **"International Year of Peace and Trust"** in
- **Digital Partnership:** agreed to establish India-Central Asia Digital Partnership Forum and welcomed Uzbekistan's offer to host the inaugural meeting.

Pakistan secures key roles in UNSC committees

- Pakistan is elected to the Chair of the 1988 Taliban Sanctions Committee, Vice Chair of the 1373 Counter-Terrorism Committee , and a Co-Chair in two informal working groups of the UNSC.

About 1988 Taliban Sanctions Committee:

- It is a subsidiary organ of the UN Security Council.
- **Function:**
  - responsible for overseeing the implementation of sanctions against individuals and entities associated with the Taliban in Afghanistan.
  - It imposes an assets freeze, a travel ban, and an arms embargo on those associated with Taliban
  - The committee also handles requests for delisting individuals and entities from the sanctions list.
- **Decision Making:** The sanctions committees of the Council comprise all 15 members of the Security Council and make its decisions by consensus.(Pakistan is a non-permanent member UNSC for the 2025-26 term.)

1373 Counter-Terrorism Committee

- It was **established by Security Council resolution 1373** after the September 11th attacks.
- It consists of **all fifteen members of the Security Council** and is responsible for ensuring that all States follow the resolution.
- **According to Resolution 1373, States must**
- deny all forms of financial support for terrorist groups.
- prevent the terrorists from acquiring safe havens or subsistence.
- cooperate with governments in the apprehension of terrorists.

- create domestic laws that criminalize terrorism.
- participate in the relevant anti-terrorism conventions.
- India was chair of the UNSC Counter-terrorism Committee for 2022 during its 2021-22 tenure in the Council as a non-permanent member.

International Organization for Marine Aids to Navigation (IALA)

- India participated in the 2nd Session of the IALA Council in Nice, France, as the Vice President of the organization.

About IALA

- IALA, established in 1957 as an NGO, transitioned to an Intergovernmental Organization (IGO) on August 22, 2024, after ratification by 34 states
- **Aim:**
  - to enhance its role in shaping international standards and best practices for safe and efficient navigation.
  - It works to reduce marine accidents and protect ecosystems. It helps developing nations build reliable navigation systems.
  - It issues guidelines for AtoN, Vessel Traffic Services (VTS), and e-navigation
- **Headquarters:** Saint-Germain-en-Laye, France.
- **Organizational Structure:**
  - **General Assembly:** Supreme governing body, meets every four years.
    - Singapore hosted the 1st General Assembly of the IALA from 18 to 21 February 2025 where the Singapore Declaration was adopted.
  - **Council:** The IALA Council is the key decision-making body of the intergovernmental organization
  - **Technical Committees:** Experts from different nations work on standardization.

Prime Minister visit to Cyprus

- This visit marked the first Indian Prime Ministerial visit to the country in over two decades.

About the Visit

- PM was awarded the **Grand Cross of the Order of Makarios III,** the highest civilian honour of Cyprus, during his historic visit.
- Ocean Governance & Climate Leadership: Strong support for the 2024 Apia Commonwealth Ocean Declaration. It emphasis on Sustainable ocean governance, Climate resilience Marine biodiversity and Capacity-building via the Blue Charter Centre of Excellence in Cyprus.
- **Regular Political dialogue:** Agreement to: Hold regular high-level talks and Implement a 2025–2029 Bilateral Action Plan monitored by foreign ministries.
- **Support for Cyprus Sovereignty**
- India reiterated support for:
  - **Cyprus's sovereignty, independence, and territorial integrity**.
  - A **UN-backed bizonal, bicommunal federation** solution.
- Both nations **opposed unilateral actions** (implicitly directed at Turkey).

Connectivity & Economic Integration

- Cyprus supports India's role in the **India–Middle East–Europe Economic Corridor (IMEC)**.
- Offered to act as a **logistics hub** for Indian trade into Europe.

EU–India Relations

- Cyprus pledged to strengthen EU–India ties during its **2026 EU Council Presidency**.
- Backed progress on:
  - **EU–India Free Trade Agreement (FTA)** (targeted for conclusion by year-end).
  - Strategic Roadmap 2025, energy, space, and technology partnerships.

Mobility, Culture & Tourism

- Mobility Pilot Program expected by **end-2025**.
- Agreed to promote tourism, cultural ties, and explore **direct air connectivity**.

Message to Turkey

- India's clear support for Cyprus's territorial integrity is seen as a **strategic message to Turkey**, amid:
  - Turkey's criticism of India on **Kashmir**.
  - Ankara's support for **Pakistan**.
- PM Modi's visit to **Nicosia's historic centre** overlooking Turkish-controlled Northern Cyprus highlighted **solidarity with Cyprus**.

INS Arnala

Context

The Indian Navy is set to commission 'Arnala' at the Naval Dockyard in Visakhapatnam.

About INS Arnala

- **Class: 1st ship** of the **Anti-Submarine Warfare – Shallow Water Craft (ASW-SWC)** class.
- **Built by**: Garden Reach Shipbuilders & Engineers (GRSE), Kolkata in collaboration with L&T Shipbuilders under a **Public-Private Partnership (PPP)**.
  - Over **80% indigenous systems are used**.
- **Propulsion**: Diesel engine + waterjet propulsion — largest Indian warship using this system.
- **Capabilities**:
  - Subsurface surveillance
  - Search & rescue missions
  - Low-intensity maritime operations
- **Name Origin**: Named after **Arnala Fort** near **Vasai, Maharashtra** — built by the Marathas in 1737 under **Chimaji Appa**.

Passage Exercise (PASSEX), 2025

Context

Passage Exercise (PASSEX) was conducted in the North Arabian Sea.

Passage Exercise (PASSEX): India–UK Naval Drills

- Conducted jointly by the **Indian Navy** and the **Royal Navy of the United Kingdom**.
- Featured Indian assets like **INS Tabar** (stealth frigate), a **submarine**, and **P-8I** long-range maritime patrol aircraft.
- Held in the **North Arabian Sea**, a key maritime trade and energy route.
- Reflected **India-UK commitment** to **maritime stability**, **freedom of navigation**, and **Indo-Pacific security**.

Rudrastra

Context

Successful Trial of the Hybrid **Unmanned Aerial Vehicle (UAV) Rudrastra Conducted at Pokhran, Rajasthan.**

About Rudrastra

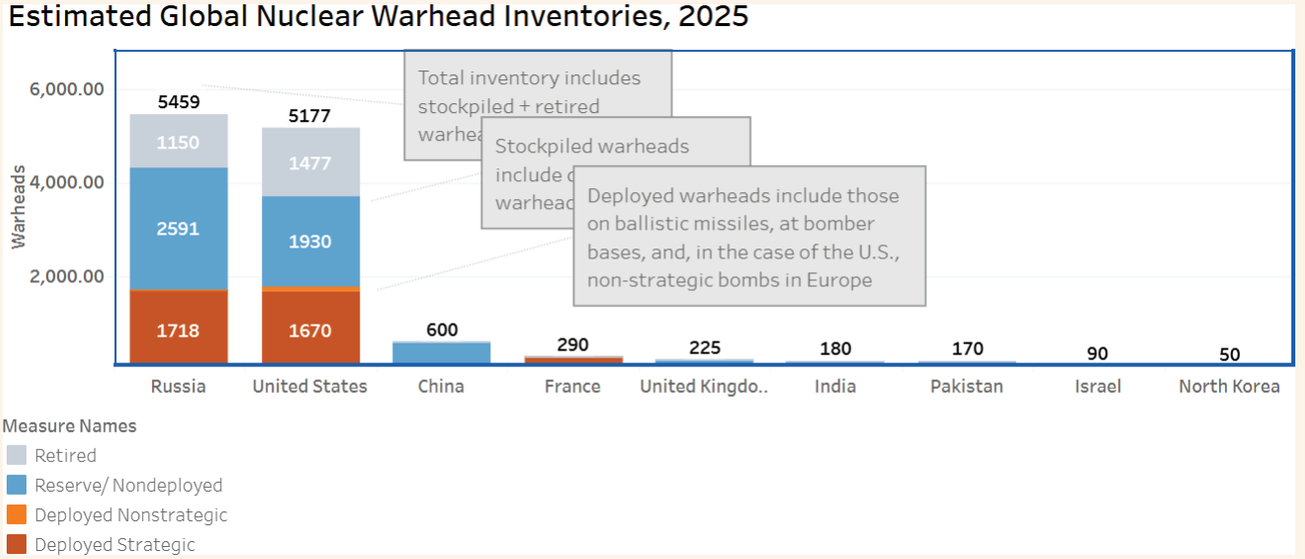
- It is a **Hybrid Vertical Take-Off and Landing (VTOL) Unmanned Aerial Vehicle (UAV)** – can take off and land vertically, does not need runways.
- **Developed by:** Solar Defence and Aerospace Limited (SDAL).
- **Features:**
  - **Weaponry:** Equipped with **precision-guided anti-personnel warheads** capable of **mid-altitude release**.
  - **Surveillance:** Capable of relaying **live video feed** and returning to the launch point autonomously.

An **UAV** is an unmanned aircraft that can be remotely operated or fly autonomously without a human pilot.

SIPRI Report

- SIPRI Yearbook 2025 revealed that **India now possesses more nuclear warheads than Pakistan**, but significantly fewer than China.

Countries with Nuclear Weapons (9 States)



Trends and Key Insights

- **Russia and USA** together hold **~90% of all nuclear warheads** globally.
- Despite a slight **decline in global stockpiles**, nuclear warheads **ready for use** have **increased**.
- All nuclear-armed states are engaged in **modernising their arsenals**:
  - Upgrading existing weapons
  - Developing new warhead designs and delivery systems
- **China's arsenal** is growing **faster than any other country**.
- Countries are investing in **more advanced systems**, including:
  - **Canisterised missiles**
  - **Multiple Independently targetable Reentry Vehicles (MIRVs)**
  - Improved **alertness and mobility** of nuclear forces

Operation Sindhu

Context

The first flight of Operation Sindhu, carrying 110 Indian students evacuated from Iran due to the escalating Iran-Israel conflict, landed safely in New Delhi.

About Operation Sindhu

- Operation Sindhu is a government-led mission to evacuate Indian nationals from conflict-affected areas in Iran.
- It is launched by the **Ministry of External Affairs (MEA)**, Government of India.
- The operation is supported by Indian Embassies in Iran and Armenia.
- Its main aim is to **safely evacuate Indian citizens**, especially students, from war-hit regions of Iran.
- The evacuation route involves transporting people from **northern Iran to Yerevan, Armenia, and then to New Delhi.**
- The Indian Embassy is closely monitoring the situation and coordinating actively with local governments.
- A 24/7 MEA Control Room has been set up in New Delhi to provide continuous assistance.

Other Evacuation Missions by India

Vande Bharat Mission	Evacuation of Indians stranded abroad during COVID-19 (2020)
Operation Devi Shakti	Evacuation from Afghanistan after Taliban takeover (2021)
Operation Ganga	Evacuation of Indians from Ukraine war zones (2022)

Operation Kaveri	Rescue of Indian citizens from Sudan conflict (2023)
Operation Ajay	Return of Indians from Israel during conflict (2023)
Operation Sindhu	Ongoing evacuation from war-hit Iran (2025)

Exercise SHAKTI

Context

Exercise SHAKTI-VIII is in news as India and France began their joint military exercise in France from **18 June 2025**, strengthening defence ties and interoperability.

About Exercise SHAKTI

- The **8th edition** of Exercise SHAKTI is being held from **18 June to 1 July 2025** at **Camp Larzac, La Cavalerie, France**.
- It is a **biennial joint military exercise** between **India and France**.
  - The **Indian Army contingent** includes **90 personnel**, mainly from the **Jammu & Kashmir Rifles**.
  - The **French contingent** also has **90 personnel**, including troops from the **13th Foreign Legion Half-Brigade (13th DBLE)**.
- **Aim:**
  - boost **interoperability**, **operational coordination**, and **military-to-military ties**.
  - **joint operations in sub-conventional warfare** under **Chapter VII of the UN Charter**.
  - Training is conducted in **semi-urban terrain**.
  - Activities include **tactical drills**, sharing of **TTPs** (Tactics, Techniques & Procedures), and use of **new-generation equipment**.
  - The exercise promotes **physical endurance**, **team spirit**, and **mutual respect**.
- It reflects the **strengthening defence cooperation** and **strategic partnership** between India and France.

Why India should address its propulsion gap

Context

- India's ambitious aerospace journey, marked by the development of platforms like the **Advanced Medium Combat Aircraft (AMCA)**, is being hailed as a major step towards military indigenisation.
- However, the country's persistent **propulsion gap** — its overdependence on foreign aircraft engines — remains a serious strategic vulnerability.
- The historical failure of the **HF-24 Marut**, and more recently the setbacks with the **Kaveri engine**, underscore this critical weakness.

Why India Should Urgently Address Its Propulsion Gap

- **Strategic Autonomy & National Security:** Relying on foreign engine suppliers leaves India vulnerable to **geopolitical pressure**, **supply chain delays**, and **technology denial regimes**, which can cripple national defence preparedness.
- **Lessons from History:** Indigenous platforms like the **Marut** and **Tejas (LCA)** suffered due to the **lack of a suitable domestic engine**, forcing reliance on imports and compromising full combat potential.
- **Delays in Force Modernisation: Delayed engine deliveries** (e.g., GE F404 for LCA Mk1A) push back timelines for induction, training, and deployment, directly impacting the IAF's operational readiness amid falling squadron strength.
- **Export Constraints:** Aircraft powered by **foreign engines require third-party clearances** for exports — limiting India's defence diplomacy and industrial outreach.
- **Naval and Armoured Dependency:** Engine dependence isn't limited to aircraft — India's **warships and tanks** also run on imported power packs, compromising holistic self-reliance in defence.
- **Barrier to 'Atmanirbhar Bharat':** Without indigenous propulsion, slogans of self-reliance remain hollow. Engines are the **heart of any combat platform**; without them, true independence is incomplete.

INS Tamal

Context

The Indian Navy is set to commission INS Tamal, on July 1, 2025.

About INS Tamal

- It is a stealth multi-role frigate of the **Krivak class**, part of a series inducted from Russia over the last two decades.
- It is the **second ship** of the **Tushil Class**, an upgraded version of earlier **Talwar** and **Teg Class frigates** (each consisting of 3 ships).
- **Built at: Yantar Shipyard, Kaliningrad (Russia)**.

- Comprises **26% indigenous components**, including:
  - **BrahMos long-range cruise missile** (for land and sea targets).
- Enhanced weaponry and systems compared to predecessors:
  - **Vertically launched surface-to-air missiles (VLS SAMs)**.
  - **Improved 100 mm naval gun**.
  - **Modern EO/IR targeting systems**.
  - **30 mm Close-In Weapon Systems (CIWS)**.
  - **Heavyweight torpedoes** and **anti-submarine rocket systems**.
  - Advanced **fire control radars** and **surveillance systems**.

POLITY & GOVERNANCE

TOPICS FOR MAINS

E-voting in local body elections

Syllabus Mapping: GS2: Elections, Transparency in Governance

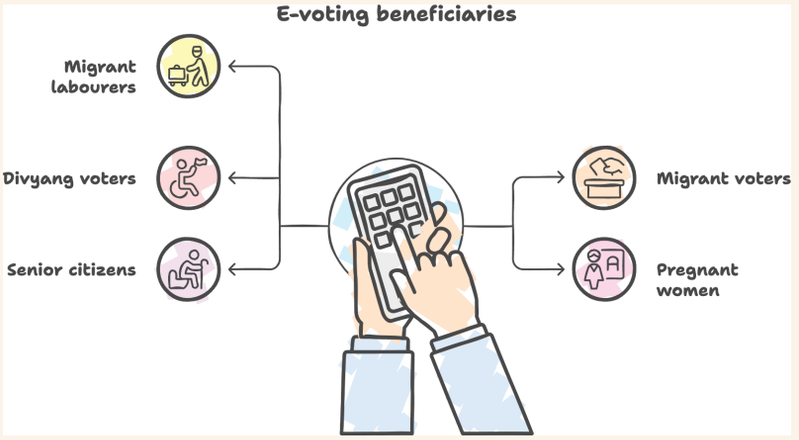
Context

Recently, in a first, voters exercised their franchise through mobile applications in Bihar's municipal bypolls and election in Nagar Panchayats in the State.

E-Voting SECBHR mobile app

Developed By:

- Centre for Development of Advanced Computing (C-DAC)
- Bihar State Election Commission (SEC)



Purpose:

- The mobile app enables remote voting without visiting polling booths.
- Up to 50,000 voters can use the system.

Woking of the E-Voting System

The new e-voting process hinges on technology is designed to keep the democratic process secure and tamper-proof:

- **Blockchain technology** ensures votes are recorded and stored in a secure, immutable system.
- **Face recognition and matching** help verify voter identities during login and voting.
- **Digital scanning and OCR (Optical Character Recognition)** assist in accurately counting votes.
- Audit trails similar to the **Voter Verifiable Paper Audit Trail (VVPAT)** in EVMs help track votes.
- **Digital locks on EVM strong rooms** provide additional physical security, even for traditional ballot processes running in parallel.

Introduction

Bihar has set a national precedent by becoming the first Indian state to implement mobile app-based voting for municipal bypolls and elections in six Nagar Panchayats. The initiative marks a significant step in using e-governance to promote inclusive democratic participation.

Potential of Mobile-Based E-Voting

- **Inclusive Participation:** The E-SECBHR app allowed elderly, disabled, and pregnant citizens, who often face logistical challenges to vote from home.
  - **Eg: Mrs Bibha Kumari** from East Champaran became the **first Indian to cast an e-vote.**
- **Empowerment of Marginalized Groups:** As highlighted by the State Election Commission, this initiative symbolizes convenience, security, and empowered participation.
- **Technological Integration:** The app was developed by the Centre for Development of Advanced Computing (C-DAC), showcasing the growing capability in secure digital governance.

- **Logistical convenience**: Voting from home for pregnant women, divyang voters, senior citizens among others reduced physician and logistical challenges in reaching polling booths.
  - **Eg**: Over 489 individuals in Bihar have voted using the app during Municipal bypolls.

Associated concerns with e-voting

- **Security and Tampering:** Concerns were raised about the potential for e-vote tampering, identity theft or unauthorized access to the mobile apps.
  - Measures such as blockchain technology, face-matching, and scanning were employed to ensure secure voting.
- **Verification Protocols:** Only two registered voters could log in from a single mobile number, with verification using voter ID details.
- **Digital Divide**: Digital illiteracy and access to smartphones and internet connectivity remain structural barriers.
  - **Eg: 51% Rural women don't own a mobile phone (NSO Data)**
- **Scalability and Transparency**: Though effective in small-scale implementation, uncertainty remains about extending it to larger elections like the upcoming Assembly polls.
- **Public skepticism**: Erosion of public trust and skepticism may arise if digital processes are not perceived as transparent or independently verifiable.

Related Quotes and Data

- **President Droupadi Murmu**: "Providing a dignified life to persons with disabilities is the responsibility of the entire society"
- **PM Modi:** "Last mile saturation of schemes ensures true social justice"
- **Former CJI DY Chandrachud**: 'Our worth as a nation will largely depend on worth we ascribe to women'
- **India ageing Report, 2023:** Current elderly population is of 153 million and is expected to reach 347 million by 2050

***The above information can be utilised in Introduction/Conclusion for Value addition**

Conclusion

Mobile-based e-voting can be a transformative tool for inclusive democracy if accompanied by robust safeguards. Bihar's experiment offers a promising template, but national-level adoption must address concerns of security, equity, and transparency to uphold the integrity of India's democratic process.

Municipal Corporations (Urban local bodies)

Syllabus Mapping: GS2: Powers, Finances, Challenges at local level

Context

Recently, Gandhinagar municipal corporation announced the listing of its Municipal Bonds on the National Stock Exchange (NSE)

Urban Governance in India

- **Urban Population**: India's urban population is over 400 million, projected to exceed 800 million by 2050. Cities contribute over 60% to GDP while occupying just 3% of land area.
- **Constitutional Backing**:
  - The **74th Constitutional Amendment Act, 1992** formalized Urban Local Bodies (ULBs) as the third tier of governance.
  - The **12th Schedule lists 18 functions** that may be devolved to municipalities, including urban planning, sanitation, and public health.
  - **Article 243X:** Empowers state legislatures to authorize municipalities to levy, collect, and appropriate taxes, duties, and fees.
  - **Article 243Y:** Mandates the constitution of State Finance Commissions (SFCs) to recommend devolution of funds and grants to ULBs.

Revenue Sources of Urban Local Bodies

Source Type	Examples
Own Tax Revenue	Property tax, water tax, conservancy tax, advertisement tax
Own Non-Tax Revenue	User charges (e.g., water usage), license fees, development charges
Other Receipts	Lease rent, income from municipal assets, sale of scrap/rubbish

Source Type	Examples
Assigned Revenue	Professional tax, entertainment tax (partly subsumed under GST)
Grants-in-Aid	From Central and State governments via Finance Commissions and schemes like SBM, AMRUT
Borrowings	Loans from Central/State governments, banks, and financial institutions

Key Findings of the RBI Report on Municipal Revenue Generation, 2024

- **Inadequate Revenue Mobilization**: In 2023–24, urban local bodies (ULBs) contributed only 0.6% of GDP, in contrast to the central government's 9.2% and state governments' 14.6%, reflecting a severe fiscal shortfall for urban development.
  - **Composition of Receipts:**
  - **Tax revenue**: 30% of total receipts
  - **Grants, contributions, and subsidies**: 24.9%
  - **Fees and user charges:** 20.2%
  - **Property Tax Collection Efficiency:** As per CAG data, Municipal Corporations in 18 states collect only 56% of the property tax demand, indicating poor compliance and administrative inefficiency.
- **High Dependence on Fiscal Transfers**: Municipalities remain financially dependent on state and central governments. In 2022–23, grants rose by 24.9% (central) and 20.4% (state), yet delays and unpredictability persist.
- **Rising Debt and Limited Market Access:**
  - **Municipal borrowings increased:** From ₹2,886 crore (2019–20) to ₹13,364 crore (2023–24), now comprising 5.2% of total receipts.
  - **Municipal bonds remain underutilized:** Totaling just ₹4,204 crore (0.09% of corporate bonds), mostly via private placements, restricting wider market participation.
  - **Green Bonds**: Though emerging, the green bond ecosystem is still at an early stage. Issuance involves high compliance costs like green audits and ongoing KPI monitoring, limiting scalability

Associated challenges with Municipal Corporations

Financial Constraints

- **Delayed Implementation:** Many states delay or inadequately act on State finance commission (SFC) recommendations, undermining predictable fiscal devolution.
  - **Eg**: Telangana's SFC was announced in 2015 but constituted only in 2018.
- **Limited Absorptive Capacity**: Urban Local Bodies (ULBs) often fail to utilize the funds allocated to them.
  - **Eg: According to a recent CAG report, ULBs in 11 out of 18 states utilized only 61% of allocated funds.**

Governance Deficiencies

- **Incomplete Devolution of Powers**: Despite the 74th Constitutional Amendment, many state governments retain key functions like urban planning and land-use regulation, stifling local autonomy.
- **Weak State Election Commissions (SECs)**: Delayed and irregular municipal elections due to underpowered SECs erode democratic accountability.
  - **Eg**: Elections to the **Bruhat Bengaluru Mahanagara Palike (BBMP)** have been pending since 2020.
- **Human Resource Shortages:** High vacancy rates and inadequate training hinder effective municipal service delivery.
  - **Eg**: CAG data shows an average 37% vacancy across 18 states, with some ULBs experiencing 30–40% workforce shortages.
- **Ineffective Urban Planning & Service Delivery:** A substantial portion of municipal budgets is spent on non-developmental activities.
  - **Eg**: As per the CAG report, 29% of municipal expenditure is not linked to infrastructure or urban development, hampering long-term city planning.

Way Forward for Strengthening Municipal Finances

- **Boost own revenue generation**: Implement valuation-based property tax systems, leverage GIS mapping, and promote digital payment solutions to enhance compliance and reduce revenue leakage.
- **Enhance Non-Tax Income**: Revise user charges for services such as water supply, sanitation, and waste management to reflect actual costs. Leverage technology and awareness campaigns to improve fee collection efficiency.
- **Ensure Timely Fiscal Transfers**: Institutionalize formula-based, inflation-adjusted, and growth-sensitive transfers from State governments to Urban Local Bodies (ULBs)

- **Diversify Funding Sources**: Expand the use of municipal bonds and explore alternative financing mechanisms to fund infrastructure projects.
  - **Eg: financial pooling across** municipalities for large-scale urban development and tap into global climate finance mechanisms to support green infrastructure and sustainable energy initiatives.
- **Strengthen Transparency**: Enforce the adoption of the **National Municipal Accounting Manual (NMAM, 2004)** for uniform and transparent financial reporting.
  - **Eg: Link state-level fiscal support** to compliance with accounting standards and invest in training municipal personnel to enhance financial accountability.

MUNICIPAL BONDS

Municipal bonds are also known as "**Muni bonds**" and are debt securities issued by local governments in order to fund public projects. Such include infrastructure development - building highways, hospitals, etc. **Vadodara Municipal Corporation** initiated **India's and Asia's first certified green muni bond for sustainable water infrastructure. (2024)**

Potential of municipal bonds in financing urban infrastructure in India

- **Urban demographic growth:** The urban population is expected to grow by 40% till 2036 which surges the demand for urban infrastructure. Municipal bonds can help meet the need of financing essential services and infrastructure.
- **Capital requirements:** Urban infrastructure calls for adequate investments which are projected at **Rs 3.5 Lakh crore for the FY21-FY26 under the National Infrastructure Pipeline.** Muni-bonds can act as a source of capital for robust infrastructure projects.
- **Global market comparison**: The Indian municipal bond market holds potential growth over the upcoming years which would be on par with global standards.
  - **Eg: US municipal bonds for 2022 stood at USD 292 Billion**
- **Debt capacity**: The untapped potential of municipal bonds to support urban infrastructure was estimated by **CareEdge Ratings.**
  - It mentioned that municipal corporations reporting adequate surplus possess financial flexibility to raise an incremental debt of about Rs. 25, 000 crore.

Limitations of municipal bonds in financing urban infrastructure in India

- **Credit risk:** The investors worry about the defaulters due to inconsistent revenue streams of municipal bodies.
  - **Eg**: **Collapse of the IL&FS in 2018,** impacted the overall confidence in the Indian bonds market and its spillover effect lies on the municipal bonds.
  - **Eg**: Early redemption of **municipal bonds in Chennai** for refinancing at lower rates, affected investor returns.
- **Inadequate price mechanism:** Urban local bodies often undercharge for services which leads to insufficient revenues.
  - **Eg: Water tariffs** set up by municipalities usually do not cover the actual cost of service.
- **Project delays:** At many times, project mismanagement leads to delays and cost overruns which affects the revenue generation expected to service the bonds.
  - **Eg**: Delay in completion of **Pune's waste management facility project.**

Interventions for the robust implementation of municipal bonds

- **Boosting creditworthiness:** By enhancing transparency in Urban local bodies in order to improve their overall financial health.
  - **Eg**: Implementing standardised financial reporting and performance metrics for Urban local bodies can help boost investors confidence.
- **Regulatory reforms:** A streamlined process of bond issuance through regulatory reforms can be an attractive option for smaller municipalities.
  - **Eg: Standardised toolkit** for bond issuance such as the **U.S. Municipal Securities Rulemaking Board (MSRB) guidelines.**
- **Realistic price mechanism:** Municipal bodies must price their services realistically to cover costs and ensure sustainable operations.
  - **Eg: Surat Municipal Corporation** used tiered water pricing that was based on usage levels to ensure cost recovery and to discourage wastage of water.
- **PMOs**: Project management officers (PMOs) can help oversee projects funded through bonds to ensure timely project completion and maintain the Municipal corporations financial health.
  - **Eg**: **Bengaluru's use of a dedicated Metro Rail project management unit** ensured its on-time delivery.

Therefore, municipal bonds can help address the existing urban infrastructure financing in India and through strategic reforms and innovations it can ensure a safe economic environment for investors and enriched quality of life for urban dwellers.

Internet Shutdowns

Syllabus Mapping: GS2: Significant features of the Constitution

Context

In recent days, Iranians experienced a near-complete internet blackout, with local service providers – including mobile services – repeatedly going offline. It throws light on the frequent internet shutdowns that raise concerns about the balance between national security and civil liberties

Recent Data on Internet Shutdowns

India records second-highest number of internet shutdowns globally in 2024

- In 2024, there were 296 internet shutdowns in 54 countries, marking a 35% rise in affected nations compared to 2023
- **Myanmar** led with 85 shutdowns, while India followed closely with 84.
- This marked India's first drop from the top spot since 2018, though it remained the country with the most shutdowns among democracies
- The 84 shutdowns in India occurred across 16 states and union territories. The regions most impacted were:
  - **Manipur**: 21 shutdowns
  - **Haryana**: 12 shutdowns
  - **Jammu & Kashmir**: 12 shutdowns

Legal Framework Governing Internet Shutdowns in India

1. **Article 19(2) of the Constitution**:
   - The government can impose **reasonable restrictions** on the freedom of speech and expression to protect national security, public order, or state integrity.
2. **Code of Criminal Procedure (CrPC), 1973:**
   - Until 2017, most internet shutdowns were imposed under Section 144 of the CrPC (**now Section 163 of the Bharatiya Nagarik Suraksha Sanhita**).
   - This section empowered District Magistrates to prevent unlawful gatherings and direct individuals to refrain from certain actions in the interest of maintaining public order.
3. **Indian Telegraph Act, 1885 (Amended in 2017)**:
   - Internet shutdowns are now primarily governed by the Temporary Suspension of Telecom Services (Public Emergency or Public Safety) Rules, 2017.
   - These rules **permit shutdowns for a maximum of 15 days at a time.**
   - **Grounds**: Orders can be issued in cases of "public emergency" or "public safety", though neither term is explicitly defined in the legislation.
   - **Issuing Authority**: Only the **Home Secretary of the Union or the respective State government** is authorized to issue such orders.
   - **Review Mechanism:** A **three-member review committee** (headed by the **Cabinet Secretary** at the central level or Chief Secretary at the state level) must be **formed within 5 days** to examine the validity of the shutdown order.

Arguments Supporting Internet Shutdowns

- **National Security Vs. Insurgency**: Internet restrictions have been used as a tool to curb militant activity and separatist narratives, especially in sensitive regions like Jammu and Kashmir.
  - Eg: Following the abrogation of Article 370 in 2019, repeated shutdowns were implemented to prevent the circulation of anti-national propaganda.
- **Preventing Communal and Ethnic Violence**: Internet suspensions are often imposed to contain communal tensions and ethnic unrest.
  - **Eg: In 2023, internet services were suspended in Manipur** following ethnic clashes to stop further escalation.
- **Curbing Misinformation**: Social media platforms can quickly spread inflammatory content. Temporary shutdowns help in containing rumors and incitement to violence.
  - **Eg: During the Delhi riots in 2020**, targeted shutdowns were imposed to halt the spread of fake news and hate content.

- **Maintaining Public Order**: During mass protests, internet restrictions are sometimes used to prevent mobilization and maintain law and order.
  - **Eg: Internet services were restricted during the anti-CAA protests** and the farm law agitations to control unrest at protest sites.
- **Preventing Examination Malpractices**: Shutdowns are occasionally employed to stop online cheating during large-scale exams.
  - **Eg: In 2021, the Rajasthan government enforced a statewide shutdown during the REET exam to ensure exam integrity.**

Arguments Against Internet Shutdowns

- **Economic Consequences**: Internet shutdowns significantly impact the economy.
  - **Eg: According to Access Now's Internet Shutdowns Report,** India suffered $1.9 billion in losses and $118 million in lost foreign investment in the first half of 2023 alone.
  - **Eg: In 2020, 129 shutdowns caused economic damages of $2.8 billion**, affecting over 10.3 million people.
  - **Eg: The Internet Society's NetLoss Calculator** estimates that a single day of shutdown in India can render up to 379 people unemployed.
- **Human Rights Violations**: Internet suspensions hinder access to justice and protection for women by limiting their ability to report crimes such as rape, murder, and domestic violence, especially in conflict zones.
- **Infringement of Fundamental Rights:** Such shutdowns curtail freedom of speech and expression under Article 19 of the Constitution and restrict the right to access information, thereby undermining digital rights and civil liberties.
- **Suppression of Media and Press Freedom:** Journalists face serious hurdles during internet blackouts.
  - **Eg: In 2019, during the shutdown in Jammu & Kashmir,** several newspapers were forced to suspend operations or relocate, and journalists struggled to file reports.
- **Obstruction of Essential Services**: Internet suspensions severely disrupt online education, telemedicine, and emergency communication systems, especially in remote and underserved areas.

Recommendations of the Parliamentary Committee on Internet Shutdowns (2021)

- **Best Practices:** The Department of Telecommunications (DoT) should undertake a comprehensive study of how democratic nations regulate internet shutdowns, and identify globally accepted best practices that can be adapted to India's unique context.
- **Define Clear Criteria for Shutdowns:** There is a need to establish codified and objective parameters to guide decisions on the grounds for suspending internet services. A structured mechanism should be developed to evaluate the necessity and merit of such actions.
- **Ensure Proportionality and Timely Withdrawal:** The DoT and Ministry of Home Affairs (MHA) should jointly frame clear guidelines based on the principle of proportionality, including defined procedures for timely lifting of shutdowns to avoid arbitrary or prolonged suspensions.
- **Inclusive Review Committees:** The existing executive-dominated three-member review committee should be made more representative by including retired judges or independent public representatives to enhance credibility and impartiality.
- **Service-Specific Restrictions Over Blanket Bans:** The DoT should develop a policy framework allowing for targeted suspension of specific internet services (e.g., social media platforms) instead of enforcing complete internet blackouts, thus minimizing disruption to public life while controlling misinformation.

Structural inequality in the Legal profession

Syllabus Mapping: GS2: Judiciary

Context

- Recently, the Supreme Court of India decided to refix the methodology and the criteria for designating lawyers as senior lawyers.
- In **Jitendra Kalla vs State (Govt.) of NCT of Delhi (2025)**, the Court revisited the earlier judgments in the **Indira Jaising vs Supreme Court of India case of 2017.**

Introduction

Historically, the Indian legal profession played a foundational role in the national freedom movement and constitutional development. Lawyers from that era upheld public service and sacrifice, contributing to a democratic legal architecture. Over time, this commitment has eroded due to arbitrary designation practices under Section 16 of the Advocates Act.

Section 16 of the Advocates Act, 1961

- **Classification within the legal profession**: Senior Advocates and Other Advocates.
- **Criteria for designation:** It includes the ability of the lawyer, standing at the Bar, special knowledge, or legal experience.

- **Legitimizes unequal treatment among equals**: Section 16 leads to the creation of a legal hierarchy and oligarchy within the profession.
- **This hierarchy:**
  - **Distorts the principle of equality before law.**
  - Adversely impacts **judicial fairness.**
  - Accelerates **commercialisation of the legal profession.**

Jitendra Kalla vs State of NCT of Delhi case (2025)

- The Supreme Court's endorsement of Section 16 of the Advocates Act has **perpetuated legal hierarchies within the profession.**
- The 2025 judgment continued the **flawed designation system,** failing to address the deep-rooted inequality in legal recognition.
- The Court's acceptance of the senior advocate classification **lacked sufficient constitutional and empirical scrutiny.**
- Instead of questioning the unequal framework, the Court legitimised subjective and arbitrary procedures for designating senior advocates.
- Such decisions have **reinforced elitism** and failed to uphold the constitutional principle of **equality before the law.**

Causes of Inequality in the Legal Profession

- **Statutory Hierarchies**: Section 16 of the Advocates Act, 1961, which allows the courts to designate certain **advocates as senior advocates,** creates a legal hierarchy based on vague criteria like standing at the Bar, special knowledge, or experience in law.
- **Subjective Designation Process**: As noted by the Supreme Court, the process of senior designation **often lacks objectivity** and tends to favour personal preferences, **elite networks, and star lawyers.**
- **Underrepresentation**: Women, lawyers from marginalized communities, and those from rural or non-metropolitan backgrounds are significantly underrepresented in senior designations and elite legal circles.
- **Commercialization of the Profession:** The growing monopoly of a few elite lawyers over high-stakes litigation has led to the commodification of legal services, creating barriers for equally competent but less-connected advocates.
- **Lack of Judicial Accountability:** Courts have not fully addressed the discriminatory implications of internal hierarchies.
  - Despite criticisms, judgments such as Indira Jaising (2017) and Jitender Kalla (2025) upheld Section 16 without sufficiently reforming its discriminatory application.

Consequences of Inequality in the Legal Profession

- **Legal plutocracy:** It takes place in a scenario where the power is concentrated among a few elite lawyers.
  - **Eg: F.S. Nariman** criticized the designation process, calling it exclusionary and based on **"homo social morphing"** i.e. selection based on self-image.
- **Creamy layer**: Women, marginalized groups, and rural lawyers are systematically excluded, creating a **creamy layer** within the legal elite.
  - The monopolisation of high-stakes litigation by **"star lawyers"** without checks has distorted the legal profession's meritocratic nature.
- **Erosion of Judicial Democracy**: When courtrooms are dominated by a privileged few, it compromises the fairness of legal representation and excludes diverse voices.
- **Impact on Political Democracy**: A **skewed legal system undermines the rule of law,** which is foundational to democratic governance.
- **Public Distrust in Legal Institutions:** A visible elite capture of legal power can diminish public confidence in the impartiality and accessibility of justice.
- **Loss of Meritocracy:** Talented young lawyers from less privileged backgrounds are often **denied opportunities** for recognition, limiting the profession's ability to renew itself.

Way Forward

- **Reform Designation Process**: Introduce objective, transparent, and inclusive criteria for designating senior advocates, with representation from all sections of the Bar.
- **Diversity Audits**: Regularly review the diversity profile of senior advocates, constitutional court lawyers, and judicial appointments.
- **Strengthen Legal Aid and Support Systems:** Institutionalize support for first-generation lawyers and expand access to mentorship and litigation exposure.
- **Limit Concentration of Appearances**: Encourage equitable distribution of cases in higher courts to reduce the dominance of a few elite lawyers.

- **Parliamentary and Judicial Scrutiny:** Revisit Section 16 of the Advocates Act and Supreme Court rules through legislative debate and constitutional interpretation.

Conclusion

Guarding against inequality in the legal profession is essential not just for upholding the ideals of the Constitution but also for ensuring a just, fair, and truly representative democracy. Unless systemic reforms are undertaken, legal elitism will continue to undermine the accessibility and credibility of justice in India.

Legal Aid

Syllabus Mapping: GS2: Judiciary

Context

The **NALSA in collaboration with the Supreme Court's Mediation and Conciliation Project Committee (MCPC)**, is developing a module to promote community mediation with the objective to encourage citizens to opt for this dispute resolution mechanism instead of choosing the litigation route.

About National legal services authority (NALSA)

- **Legal Basis**
  - Constituted under the **Legal Services Authorities Act, 1987**
  - **Statutory body formed (1995)** to provide legal aid nationwide
- **Primary Mandate**
  - To ensure **"Access to Justice for All"**, particularly for marginalized and underprivileged groups.
  - Enhance **speedy disposal of cases** via mediation and alternative dispute resolution methods
  - Reduce burden on formal courts by **promoting ADR mechanisms like Lok Adalats**
- **Institutional Structure**
  - The Chief Justice of India serves as Patron-in-Chief.
  - Executive Chairman: Second-most senior Supreme Court judge.
- **Decentralized Framework:** Replicated at State and District levels:
  - **State Legal Services Authorities (SLSAs)** led by Chief Justices of High Courts
  - **District Legal Services Authorities (DLSAs)** led by District & Sessions Judge

LOK ADALATS

"Peace is a sine qua non for development"

Introduction to Lok Adalats

- Lok Adalat means **"People's Court"** and is **based on Gandhian principles**.
- Lok Adalats are given statutory status under the **Legal Services Authorities Act, 1987**.
- **Section 19(5):** Lok Adalats have jurisdiction to arrive at a compromise or settlement.
- **Section 22:** They have the same powers as vested in Civil Courts under CPC, 1908 for certain matters.
- It is an **Indian innovation** in the judicial system.
- Lok Adalats are being organized by NALSA and State LSAs for amicable settlement of disputes. Though Lok Adalats are designed to expedite case resolution, they encounter challenges due to their limited powers compared to regular courts

Data

- National Lok Adalats achieved a **110% increase** in total case disposals in 2023 compared to the previous year.
- **State Lok Adalats** improved from **8,51,309 cases (FY 2022-23)** to **9,97,494 cases (FY 2023-24)**

Function/Role/Power of Lok Adalats

- **Utilization of Existing Infrastructure**: Lok Adalats are typically held on non-working days of the courts. This allows for the optimal use of existing court infrastructure for periodic Lok Adalats without requiring dedicated space.
- **Judicial Training**: Referral judges and deputed judges for Lok Adalats are:
  - Regularly trained at State Judicial Academies

  - Training is aligned with State-specific judicial training schedules
- **Pre-Lok Adalat Meetings**: NALSA encourages SLSAs to conduct these meetings to ensure parties are informed and motivated to attend.
  - Result: These efforts have led to a noticeable increase in disposal rates.
- **Alternate Dispute Resolution (ADR):** Effective for resolving disputes in a conciliatory manner outside courts.
- **Pocket friendly:** No court fees are payable, and any paid fees are refunded if the dispute is settled there (According to NALSA). This enables Lok Adalats to provide a cost-effective and speedy alternative to traditional court proceedings.
- **Non-Appealable:** Awards are deemed decrees of a civil court. An appeal is generally not allowed against an award passed by a Lok Adalat. The award of a Lok Adalat is considered final and binding on all parties involved.

Challenges Faced by Lok Adalats

- **Limited Powers Compared to Regular Courts**: Lok Adalats do not possess the full range of powers that regular courts have. This limits their ability to enforce participation and manage proceedings effectively.
- **Absence of Formal Procedures:** Lok Adalats are not bound by strict legal procedures. While this provides flexibility, it may result in inconsistency and inefficiency in handling disputes.
- **Inability to Compel Party Attendance**: Lok Adalats cannot legally compel parties to appear. This often leads to one or more parties being absent during hearings.
- **Resulting Delays in Disposal:** When parties fail to appear, the intended swift resolution process is disrupted. This defeats the objective of quick and amicable dispute settlement.
- **Complexity**: Repeated sittings with the same judge are often not feasible, breaking the continuity of deliberations.
- **Imposed Justice**: Compromises may be imposed on the poor who may have limited choices.
  - **Eg:** Some litigants may accept reduced compensation or future values of claims to end a long-pending legal process.
- **Patriarchy**: Poor women may be pressured by family courts to compromise matrimonial disputes under romanticized views of marriage.

Way forward

- **State Legal Services Authorities (SLSAs)** have been advised to take up the matter of **infrastructure, facilities, and staffing** at the **State/UT Government and High Court level.**
  - In order to ensure **long-term institutional support** for the efficient functioning of Lok Adalats
- **NALSA proposes to launch extensive awareness initiatives** to:
  - Promote Lok Adalats as effective **Alternative Dispute Resolution (ADR)** mechanisms.
  - Encourage **higher participation**, further boosting efficiency and disposal rates.
- **Literacy Programs**: Provide legal literacy and aid programs for the poor and marginalized.
- **Awareness Camps:** Conduct camps at grassroots levels and use mass media to spread awareness.
- **Increase Remuneration**: Raise remuneration for lawyers from legal service authorities to encourage effective assistance.
- **Establish Balance**: Balance formal and informal forums to encourage redressal through Lok Adalats.
- **Protect Indigenous People**: Address social injustices in rural cultures by integrating some protections from the judicial system.
- **Regularity**: Increase the frequency of Lok Adalats.

Conclusion

Lok Adalats play a **crucial role in advancing "equal access to justice" and clearing case backlogs**. Their success in Indian practice underscores their importance in the justice system.

Access to Legal AID for Prisoners

Introduction

According to the **Prisons Act of 1894**, a **prison** refers to "**any jail or facility (whether used on a permanent or temporary basis) designated by the State Government for the detention of prisoners**". This includes all associated land and buildings. However, it excludes:

- Facilities used solely for holding individuals in police custody,
- Any location specifically designated by the State Government, and

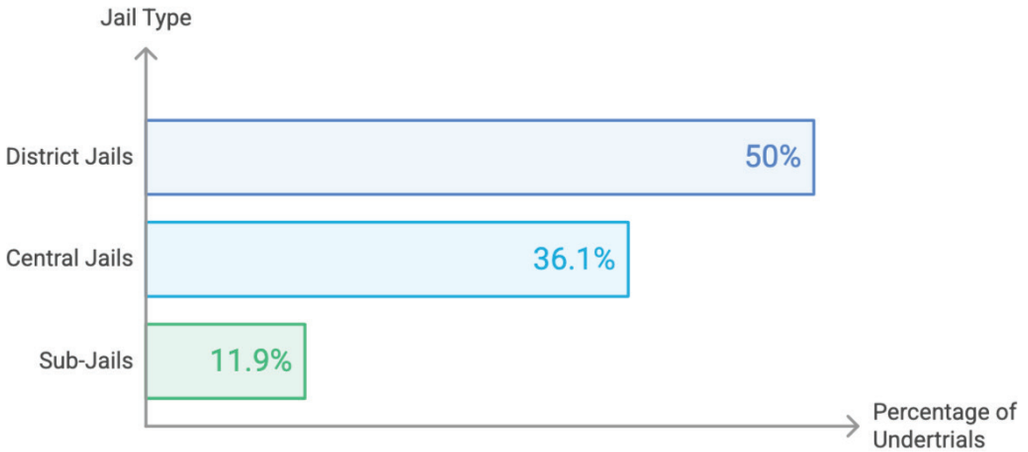
- Any place declared as a subsidiary jail through a general or special order by the State Government.

President Droupadi Murmu unveiled a report: **"Prisons in India: Mapping Prison Manuals and Measures for Reformation and Decongestion."**

- A key recommendation of the report is the **electronic tracking of prisoners** as a strategy to address prison overcrowding.

Issues Associated with Prisons and Prisoners in India

1. **Overcrowding**
   - **Definition**: The occupancy rate reflects the number of inmates housed in jails relative to their sanctioned capacity (e.g., 100 inmates for a capacity of 100 = 100% occupancy).
   - **Despite a reduction from 140% (2007) to 131% (2022),** Indian prisons continue to remain overcrowded
   - Notably, the occupancy rate among transgender inmates is alarmingly high at 636.4%.



Distribution of Undertrials in Jails (2019-2023)

2. **High Proportion of Undertrial Prisoners:** According to **Prison Statistics India 2020,** undertrials constitute over 75% of the prison population.
3. **Unnatural Deaths in Custody:** Includes suicides, inmate violence, neglect, and other causes.
   - Prison Statistics 2020: Out of 189 unnatural deaths, 156 were suicides, followed by 8 murders and 8 accidental deaths.
4. **Understaffing**: As of December 2020, only 61,296 personnel were in service against a sanctioned strength of 87,961, hampering prison management.
5. **Judicial Backlogs:** Over 4.7 crore cases are pending (2022), especially in subordinate courts.
   - Delays in trials prolong the detention of undertrials and burden the prison system.
   - Solution: Increase judge strength and improve case disposal rates.
6. **Systemic Discrimination**: Corruption and caste/class bias within prisons result in inhumane treatment of socio-economically weaker inmates.
   - Basic rights are often denied, and custodial torture is prevalent.
7. **Poor Health and Mental Well-being**: Overcrowding, poor sanitation, limited healthcare access, and lack of mental health support worsen physical and psychological conditions.
   - Mental health remains a neglected aspect of prison welfare.
8. **Economic and Social Disparities:** Marginalized groups encounter more obstacles in seeking justice.
   - **Eg**: The President of India highlighted the **black coat syndrome** in courts which describes the anxiety experienced by ordinary citizens in court settings.

Measures to Improve Prisons and Prisoners Conditions

1. **Legal Services Management System (LSMS)**
   - Developed by NALSA as a centralized digital platform to allow prisoners and other beneficiaries to apply for legal aid and provides real-time application tracking.
   - **In Prisons:** Prison Legal Volunteers (PLVs) and Jail Visiting Lawyers help prisoners access the LSMS portal

2. Legal Aid Access at All Stages of Criminal Justice System

Police Stations

- **NALSA's Early Access to Justice Framework**: Legal aid is available at pre-arrest, arrest, and remand stages
  - **Eg: As per 2023 Data, 20,688 arrested persons were provided legal aid at police stations**

Courts

- **Remand Lawyers:** To be deputed at courts to assist arrested persons
  - **Eg: As per 2023 Data, 9,372 remand lawyers deployed across the country** who filed 66,294 bail applications and out of which 56% of these applications were successful.

Prisons

- **NALSA's SOP:** Every prison must have a Legal Aid Clinic Staffed by Jail Visiting Lawyers, located in accessible areas for prisoners
  - **Eg; As per 2023 Data**: 1,171 Prison Legal Aid Clinics have been Visited by 3,32,600 prisoners, of which 2,33,269 prisoners received legal assistance.

3. Effective Implementation of the Model Prison Manual, 2016

- Aligns with Article 39A of the Constitution (free legal aid).
- Key provisions:
  - District-level Undertrial Review Committees
  - Legal aid clinics in prisons
  - Appointment of competent defense lawyers
  - Better living conditions, especially for women
  - Annual reviews of implementation

4. E-Prisons Project

- Supported by MHA (Ministry of Home Affairs), the project uses the **Prisoner Information Management System (PIMS)** to digitally store prisoner data: biometrics, legal history, medical records, etc.
  - Legal aid web application launched in 2017 by NALSA for undertrial support.

5. Bail for Eligible Undertrials

- **268th Law Commission Report (2017)**: Recommends bail for undertrials who have served one-third of the maximum sentence for offences punishable up to 7 years.

6. Alternate dispute redressal:

- **Lok Adalats** help in ease of communication where parties can directly interact with the judge.
- **Fast track courts**: Special courts for speedy trials to make the judiciary more effective and to avail justice as fast as possible.

7. Promotion of Open Prisons

- Minimum-security facilities for well-behaved convicts.
- Encourage agricultural or community-based work.

8. Mulla Committee (All India Jail Reforms Committee) Recommendations

- Establish a **National Prison Commission**.
- Ban housing juvenile offenders with hardened criminals.
- Enact protective laws for juvenile delinquents.

Parliamentary Standing Committee (2025)

Committee Findings:

- **Over 70% of prisoners are undertrial**: The committee reports that more than 70% of inmates in Indian prisons are awaiting trial, most of whom cannot afford bail or fines
- **High cost of detention versus bail:** It is far more expensive for the state to keep prisoners incarcerated than the bail amounts required for their release.
- **Limited Access to Justice for Undertrials:** Many undertrial prisoners still face barriers in accessing legal aid and timely legal consultation remains inadequate.

Recommendations:

- NALSA should study and evaluate such cases and Undertrial prisoners must be assisted on priority to ensure timely legal remedies.
- **Need for a Centralised Application Process to ensure:**
  - Prompt allocation of legal counsel
  - Efficient case tracking

  - Minimized delay in accessing legal remedies
- **Technology in prisons**: Suggested adoption of surveillance systems like **X-ray scanners**, **e-Mulakat (video visits)**, and enhanced frisking to curb smuggling of Narcotics and mobile phones.

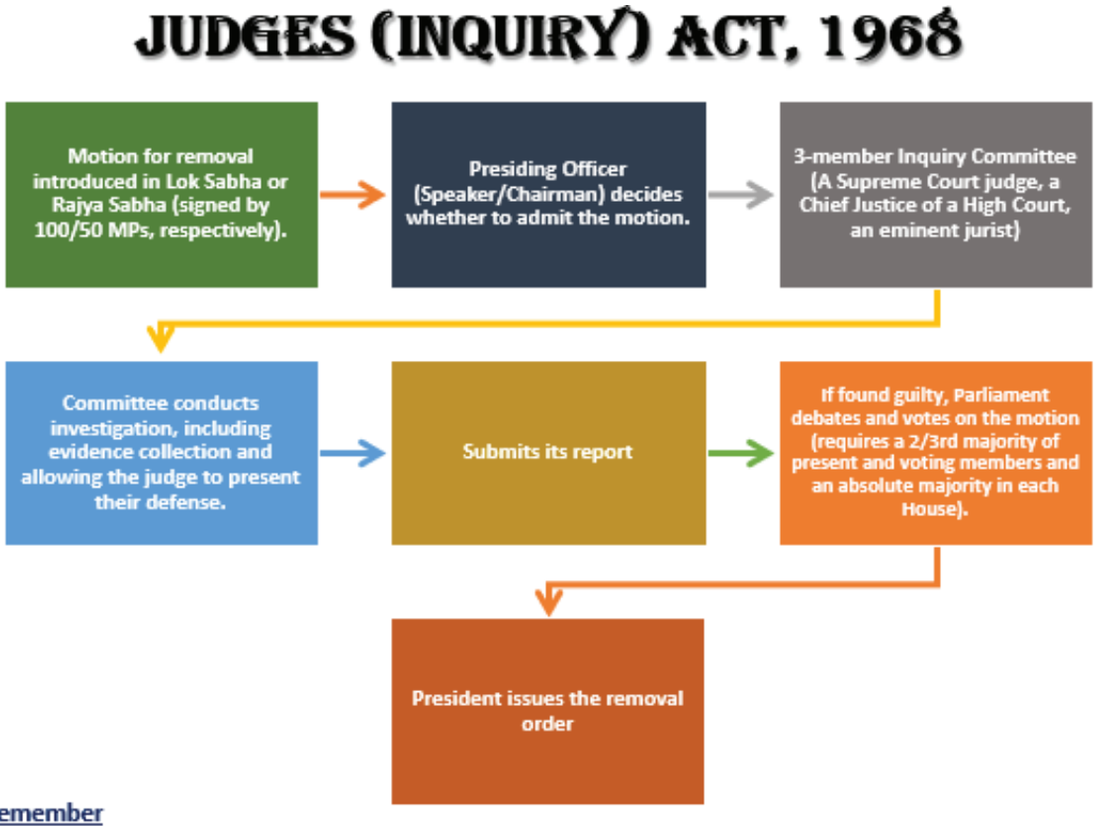
Judicial accountability

Syllabus Mapping: GS2: Judiciary

Context

- Justice Yashwant Varma case (discovery of burnt currency from his residence) has sparked concerns about judicial accountability and independence.
- The 2024 controversy over Justice Shekhar Kumar Yadav's speech at a Vishwa Hindu Parishad event brought to the forefront concerns regarding the effectiveness of accountability mechanisms in India's higher judiciary.
- In one instance, a former Chief Justice of India became part of the internal panel investigating sexual harassment allegations against himself, raising concerns over conflict of interest.

Relevant Constitutional and Legal Provisions



Points To Remember

- **Applies to the judges of the Supreme Court** (including the Chief Justice of India) and **the High Courts** (including Chief Justice).
- The **motion for removal must be signed by**: At least **100 members of the Lok Sabha** or At least **50 members of the Rajya Sabha.**

Existing Mechanisms for Judicial Accountability

- **Impeachment Process**: Governed by **Articles 124, 217, and 218 of the Constitution and the Judges (Inquiry) Act, 1968**, impeachment is the formal process for removal of judges, though it is rarely used due to its high threshold.
- **In-House Procedure (1999):** Developed to address complaints of judicial misconduct internally, this mechanism draws on two key ethical frameworks:
  - The Restatement of Values of Judicial Life (1997)
  - The Bangalore Principles of Judicial Conduct (2002)

- **Structure and Process**:
  - The Chief Justice of India can receive complaints against judges of the Supreme Court and Chief Justices of High Courts.
  - Chief Justices of High Courts are authorized to process complaints within their respective jurisdictions.
  - Complaints are examined by a three-member committee, which may recommend disciplinary or criminal action.
- **Composition of Committees**:
  - **Against a High Court Judge**: Complaint Committee to consist of Two Chief Justices from other High Courts + one High Court judge
  - **Against a High Court Chief Justice:** One Supreme Court judge + two Chief Justices from other High Courts
  - **Against a Supreme Court Judge:** Three judges of the Supreme Court
- **Notable cases**: **Justice Soumitra Sen and Justice Nirmal Yadav** were found guilty by such in-house committees, demonstrating the system's potential effectiveness despite limitations.

Landmark case of Justice K. Veeraswami (1991)

About the landmark case: The trajectory of judicial accountability in India reflects a nuanced balance between constitutional autonomy and legal obligation. The landmark judgment in **K. Veeraswami v. Union of India (1991)** significantly reshaped the framework for initiating legal action against judges by instituting procedural safeguards that still shape judicial oversight today.

Constitutional Issues in the Veeraswami Case

Period: 1976–1979

- **Justice K. Veeraswami held the position of Chief Justice of the Madras High Court** from May 1969 until April 1976.
- Allegations arose that he possessed assets and financial resources allegedly disproportionate to his known income sources.
- Acting on these claims, **the Central Bureau of Investigation (CBI) filed a First Information Report (FIR) against the sitting Chief Justice.**
- Facing these charges, Justice Veeraswami took leave just a few months before his scheduled retirement.

Period: 1979–1991

- In 1979, a full bench of the Madras High Court, by a 2:1 majority, declined to dismiss the CBI investigation. Justice Veeraswami approached the Supreme Court, questioning the **constitutional validity of initiating criminal proceedings against a sitting judge**.
- The apex court was asked to consider two fundamental constitutional questions:
  - **Whether a High Court or Supreme Court judge qualifies as a "public servant"** under the **Prevention of Corruption Act, 1947.**
  - Who constitutes the **"competent authority"** authorized to sanction the prosecution of such a judge.

1991 Supreme Court Ruling

- **Constitutional Principles Laid Down:** In a 3:2 majority decision, the Supreme Court ruled that although a **judge qualifies as a "public servant"** for the purposes of initiating a corruption case, any such **prosecution requires prior sanction** from the Chief Justice of India (**CJI**)
- The Court clarified that a **judge does not stand in an employer-employee** or **master-servant relationship** with the **President** of India.
- **Protective Safeguards Introduced:** The requirement of CJI's sanction was instituted as a **constitutional buffer to shield the judiciary** from undue executive influence.
- Though, under general law, the authority that appoints a public servant typically grants prosecution sanction, the **judiciary** was given **enhanced protection to preserve its independence.**
- The ruling firmly established that **no criminal investigation against a sitting judge** can begin **without** the express **prior approval of the Chief Justice of India.**

K. Veeraswami case ruling in practice (1991-2025)

- **Rarely Invoked Since Inception:** Since the Supreme Court's 1991 ruling, CJIs have exercised the power to sanction **prosecution against sitting judges with extreme caution**.
- For almost 30 years, no CJI approved such a sanction, reflecting the mechanism's role in **safeguarding judicial independence**—though it may have inadvertently **limited avenues for accountability.**
- **First Significant Use (2019):** The precedent was applied for the first time in 2019.
  - **Eg: CJI Ranjan Gogoi granted the CBI permission to file an FIR against Justice S.N. Shukla of the Allahabad High Court.**
  - However, the executive did not further act on it.

Key Concerns Regarding Judicial Accountability in India

1. **Accountability Vs. Judicial Independence:** Efforts to introduce **greater accountability** in the judiciary are often perceived as a **threat to its independence.**
   - **Eg: The Collegium System**, established in 1993 for appointing judges, has been widely criticized for its **lack of transparency.**
   - To address this, the **National Judicial Appointments Commission (NJAC)** was introduced.

- However, in the **Advocates on record association case (2015)** the Supreme Court struck down the NJAC, **reaffirming judicial primacy in appointments**.

2. **Cumbersome Impeachment Process**: The constitutional procedure for impeachment under **Articles 124 and 217** is extremely cumbersome and rarely results in action.
   - **Eg: No judge has ever been removed through impeachment**.
   - **Eg: Justice Ramaswamy,** though found guilty of misusing court funds, avoided removal due to insufficient support in Parliament.
3. **Lack of Mandatory Asset Disclosure**: There is no binding requirement for judges to publicly disclose their assets.
   - **Eg**: In 1997, a resolution was passed encouraging judges to declare their own and their family's assets to the CJI.
   - In 2009, the Supreme Court resolved to publish judges' assets voluntarily on its website.
   - Recently, all sitting SC judges have agreed to disclose their assets publicly via the Supreme Court's official website, marking a positive step toward transparency.
4. **Other Legal and Procedural Barriers**
   - **Immunity from Criminal Prosecution**: The K. Veeraswami judgment (1991) mandates prior approval from the CJI before initiating criminal proceedings against High Court or Supreme Court judges.
   - **RTI Restrictions**: The Supreme Court and several High Courts have declined to provide information under the Right to Information (RTI) Act on matters such as collegium proceedings and personal asset disclosures, curbing public scrutiny.

Way Forward for Strengthening Judicial Accountability

- **Revival of the Judicial Standards and Accountability Bill**: Originally introduced in the 15th Lok Sabha, the bill lapsed with the dissolution of the House.
  - A revised version could be reintroduced in Parliament to establish clear judicial standards and create a credible mechanism to inquire into judicial misconduct, while maintaining a balance between independence and accountability.
- **Establishment of a National Judicial Commission (NJC)**: Recommended by the **80th and 121st Law Commission Reports,** the NJC would be tasked with overseeing judicial appointments and disciplinary matters.
  - It is suggested that, along with senior judges, the commission should include non-judicial members to promote greater transparency and broader accountability.
- **Creation of a Permanent Disciplinary Committee**: A central-level disciplinary authority composed of senior members of the judiciary could be formed to address complaints against judges.
  - For **minor misconduct,** the committee could issue warnings, reprimands, or advisories.
  - In **more serious cases,** it could recommend the formation of a Judicial Inquiry Committee under the Judges (Inquiry) Act.
- **Regular Judicial Oversight and Performance Review**: A system of ongoing evaluation should be implemented to assess the conduct and performance of judges.
  - This would help ensure that deviations from ethical standards or instances of misconduct are identified and addressed promptly.

Implications of Judges joining politics

Syllabus Mapping: GS2: Judiciary, Seperation of Power

Context

Chief Justice of India B R Gavai has said that judges taking up government appointments "immediately after retirement" or resigning to contest elections "raises significant ethical concerns and invites public scrutiny".

Instances of Judges Joining Politics

- **Justice Fazl Ali (1952):** Appointed Governor of Odisha soon after SC retirement.
- **Justice M.C. Chagla (1958):** Resigned as CJ of Bombay HC to become Ambassador to the U.S.
- **Justice K. Subba Rao (1967):** Resigned as CJI to contest Presidential elections.
- **Justice Baharul Islam (1983):** Resigned from SC to contest Lok Sabha elections.
- **T.N. Chaturvedi (2002):** Appointed Governor of Karnataka after serving as CAG.
- **M.S. Gill (2004):** Former CEC nominated to Rajya Sabha and made Union Minister.
- **Former CJI Ranjan Gogoi (2020):** Nominated to Rajya Sabha within four months of retirement as CJI.

***You can utilise the above mentioned examples in questions on Judicial accountability or Seperation of Power as well.**

Introduction

While the Constitution provides strong safeguards — fixed tenures, financial autonomy, and limited removal processes — for bodies like the Supreme Court, Election Commission, CAG, etc., it **does not bar** former judges or bureaucrats from joining politics, contesting elections, or being nominated to political posts after their term ends

Constitutional Restrictions on Post-Retirement Benefits

- **Article 124(7):** Retired Supreme Court judges are barred from practicing law before any court or authority in India.
- **Article 220:** Retired High Court judges cannot appear before any court or authority except the Supreme Court or other High Courts.
- **Article 148(4):** The Comptroller and Auditor General (CAG) is ineligible for any future office under the Central or State government after retirement.
- **Article 319:** UPSC Chairman and Members are barred from taking up further government employment after demitting office.

Implications of Judges Joining Politics

- **Erosion of judicial independence:** When judges join politics soon after retirement, it creates perceptions of political bias even during their tenure on the bench.
  - **Eg: Justice Ranganath Mishra,** former CJI, joined the Indian National Congress and became an MP soon after retirement, raising concerns over conflict of interest.
- **Blurring Constitutional Boundaries:** The doctrine of separation of powers mandates a clear distinction between the judiciary and executive. Judges moving into political roles undermine this principle, potentially leading to institutional imbalance.
- **Violation of Oath**: Constitutional functionaries swear to act **without fear or favour.** Political affiliations post-retirement raise doubts about their impartiality during service.
- **Possibility of Political Patronage:** Politicians may reward favorable judges with post-retirement posts or political roles, creating a system of quid pro quo.
  - **Eg: Justice Baharul Islam,** after resigning from the Supreme Court, contested elections, raising alarms over judicial politicization.
- **Inconsistent Cooling-Off Period Norms:** Civil Services Rules mandate a cooling-off period before joining private jobs, but there's no such rule for political roles.
  - **Eg: Ranjan Gogoi (2020)** got nominated to Rajya Sabha within four months of retirement as CJI.
- **Breach of Bangalore Principles (2002):** Values such as impartiality, integrity, and propriety are compromised when judges enter political life soon after retirement.
- **Loss of Public Trust:** Judicial pronouncements (Such as **All India Judges' Association v. Union of India, 1991**) highlight how post-retirement roles may lead to erosion of public confidence in constitutional authorities.
  - **Eg: Justice P. Sathasivam**, after serving as CJI, was appointed Governor of Kerala, sparking criticism about judicial neutrality.

Way Forward

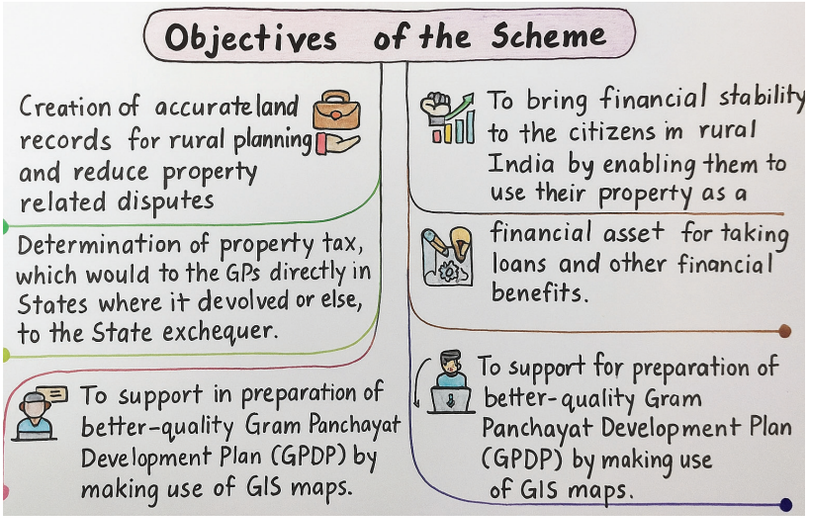
- **Cooling-off period:** Parliament should enact a law mandating a minimum two-year cooling-off period before retired officials take up political roles.
- **Raise Judicial Retirement Age:** Increasing retirement age to 70 can reduce incentives for post-retirement appointments.
- **Supreme Court (2022):** Rejected a plea for imposing cooling-off periods, stating it's a legislative matter.
- **Criteria-Based Tribunal Appointments:** Appointments should consider factors like nature of cases handled, judicial experience, and domain expertise.
- **Promote Self-Regulation:** Ethical restraint by individuals in high offices, as exemplified by Justices Chelameswar, Kurian Joseph, and former CJIs Kapadia, Lodha, and Thakur, should be the norm.

SVAMITVA Scheme

Syllabus Mapping: GS2: Rural governance

Context

India made a strong impact at the World Bank Land Conference 2025 at Washington D.C. showcasing flagship initiatives like the SVAMITVA Scheme and Gram Manchitra platform which gained global recognition as models of inclusive, tech-driven rural governance.



About SVAMITVA Scheme

- **Launched in:** 2020
- **Implementing Agencies**: The scheme is jointly executed by the Ministry of Panchayati Raj, State Revenue Departments, State Panchayati Raj Departments, and the Survey of India.
- **Key Technology Partners:** Survey of India and National Informatics Centre Services Inc. (NICSI)

Major Components

- **CORS Network Setup**: A network of Continuously Operating Reference Stations (CORS) is established to provide Ground Control Points for precise geo-referencing and land demarcation.
- **Drone-Based Mapping:** The Survey of India conducts drone surveys of inhabited rural areas to generate accurate property maps for issuing legal ownership documents.
- **IEC Activities:** Information, Education, and Communication initiatives raise awareness among rural residents about the scheme's processes and benefits.
- **Gram Manchitra Integration:** Digital spatial data collected through drone mapping supports planning and analysis under the Gram Panchayat Development Planning framework.

Significance of the SVAMITVA Scheme

- **Legal Empowerment and Land Dispute Resolution**: By issuing property cards, the scheme grants formal ownership rights to rural residents, significantly reducing land-related conflicts.
  - **Eg: 1,30,633 property cards** have been distributed nationwide, helping to resolve longstanding land disputes.
- **Economic Inclusion and Financial Empowerment:** The property cards serve as legally recognized assets, enabling rural citizens to access formal credit and banking services.
  - **Eg: Surveys have covered 67,000 sq.km of residential rural land**, with an estimated value of ₹132 lakh crore, highlighting the massive economic potential unleashed by the scheme.
- **Improved Governance and Efficient Resource Use:** Updated property records have enhanced revenue generation and enabled data-driven decision-making at the local level.
  - **Eg: Ekhatpur-Munjvadi (Maharashtra)** improved its Own Source Revenue, and Bilkisganj (Madhya Pradesh) transitioned from sketch maps to spatial data for better planning.
    - This fosters more efficient public service delivery and strengthens grassroots governance.
- **Technological Advancement in Rural Mapping**: SVAMITVA introduces cutting-edge technology into rural land management through the use of survey-grade drones and CORS networks.
  - **Eg: Drone surveys have been completed in 92% of notified villages across 31 States/UTs,** reflecting the scalability and efficiency of the model.
- **Blueprint for Sustainable Rural Development**:The scheme lays the groundwork for integrated rural planning and development.
  - **Eg: States like Haryana and Uttarakhand**, have **achieved 100% coverage in drone surveys and property card issuance**.

Implementation Challenges of the SVAMITVA Scheme

- **Legal Ambiguity Around Property Cards:** The legal status of property cards remains uncertain, as they are not always accepted by financial institutions as definitive proof of ownership.
  - **Eg: States need to amend their Revenue Acts** to include property cards as documents requiring stamp duty to enhance their legal standing.
  - Without such legal backing, property cards risk being **reduced to "just another document"** with limited legal authority.
- **Diverse State Land Laws and Record-Keeping Practices:** Land governance varies significantly across states, leading to inconsistency in implementation.
  - **Eg: Andhra Pradesh records both registered and unregistered land liabilities**, while most states record only registered ones, creating data mismatches and integration issues.
- **Limited Taxation Powers of Gram Panchayats:** Not all Gram Panchayats are authorized to collect property tax, limiting the scheme's impact on local revenue generation.
  - **Eg: In Odisha, Gram Panchayats lack taxation authority altogether.**
  - **Eg: In Uttar Pradesh and Uttarakhand, property tax is collected by District Panchayats, not the village-level bodies.**
- **Inadequate Safeguards for Vulnerable Groups:** There is a risk that influential individuals may manipulate the process to claim ownership at the expense of marginalized groups—such as Scheduled Castes, Scheduled Tribes, women, and tenant farmers.
  - **Eg: Karnataka and Maharashtra extend coparcenary rights to daughters**, but such protections are not uniformly enforced elsewhere.
- **Data Governance and Transparency Gaps:** There is no uniform framework to ensure compliance or transparency in handling the data generated by the scheme.
  - Provisions for public access to non-personal land data are lacking, limiting transparency and accountability in land governance.

Way Forward for Effective Implementation of SVAMITVA Scheme

- **Strengthen Legal Backing:** Amend state Revenue Acts to recognize property cards as official, stamp duty-bearing documents, thereby enhancing their acceptance by financial institutions as valid proof of ownership.
- **Harmonize Land Record Practices**: Establish standardized protocols for recording all liabilities—both registered and unregistered—on property cards.
  - Provide capacity-building and training for revenue officials to ensure consistent and accurate record-keeping.
- **Empower Grassroots Governance:** Legally enable all Gram Panchayats to collect property tax, ensuring greater financial autonomy.
  - Introduce detailed property classification systems and ensure ground-level verification during surveys to improve accuracy in taxation and planning.
- **Safeguard the Rights of Vulnerable Groups:** Train survey teams to identify and protect the land rights of Scheduled Castes, Scheduled Tribes, women, and tenant farmers.
  - Encourage inclusive participation of these communities in the surveying and documentation process to ensure fair representation.
- **Improve Data Transparency and Governance**: Make non-personal land data accessible to the public to foster accountability and trust.
  - Adopt uniform geospatial data standards across states to establish a robust framework for land data sharing, compliance, and digital governance.

Cooperatives as Engines of Growth

Syllabus Mapping: GS2: Development processes and development industry

Context

Recently Cooperative Literacy Camps were organised in Assam to mark the International Year of Cooperatives. It throws light on the significance of India's cooperative movement in driving inclusive growth.

About Cooperatives

- **Definition**: A cooperative is a voluntary association of individuals who come together to fulfill common economic, social, or cultural needs through collective ownership and democratic decision-making.

- **Objective**: Cooperatives primarily aim to empower their members, especially those from economically weaker sections, by promoting the principles of self-help and mutual support.
- **Collective Resource Utilization:** Members contribute and share resources, working collaboratively to ensure equitable benefits for all involved.
- **Global Recognition**:The global expansion of the cooperative model owes much to the efforts of the **International Cooperative Alliance (ICA)**
- **Established in 1895 by E.V. Neale and Edward Owen Greening**, the ICA is a prominent international NGO advocating for cooperative enterprises worldwide.
- In 2024, India hosted the **ICA Global Cooperative Conference** for the first time.
- The theme of the event, **"Cooperatives Build Prosperity For All"**, echoed India's national vision of **"Sahkar Se Samriddhi"** (Prosperity Through Cooperation)

Cooperatives in India

- **Origin**: 100 years ago in **1904 the Cooperative Credit Societies Act** was passed in pre-independent India (Marking the formal history of cooperatives)
- **Present Scenario:** India accounts for **27% of the world's cooperatives**, with 20% of its population participating in cooperative societies—significantly higher than the global average of 12%.
- **Major Sectors:** The most prominent cooperative sectors in India include:
  - Housing
  - Dairy
  - Primary Agricultural Credit Societies (PACS)
- **Leading States**: About 57% of the country's cooperatives are concentrated in a few key states:
  - Maharashtra alone accounts for 25%, followed by Gujarat, Telangana, Madhya Pradesh, and Karnataka.
- **Constitutional Recognition**: **97th Constitutional Amendment (2011)** granted **constitutional status to cooperatives** and introduced several important provisions:
  - **Fundamental Right:** Included the right to form cooperative societies under Article 19(1)(c).
  - **Directive Principle:** Added Article 43B to promote voluntary formation, autonomous functioning, and professional management of cooperatives.
  - **New Part IXB (Articles 243ZH to 243ZT):** Established a comprehensive framework for the governance of cooperative societies.
- **Governance Framework:** Multi-State Cooperative Societies fall under Entry 44 of the Union List in the Constitution. They are regulated by the **Multi-State Cooperative Societies Act, 2002.**

Role of Cooperatives in Socio-economic Development

- **Fostering Social Unity:** Cooperatives strengthen social ties and community relationships through voluntary association, without external intervention.
  - **Eg: Housing cooperatives serve as a bridge** between residents and urban governance, encouraging grassroots-level engagement and participatory development.
- **Empowering Communities:**
  - **Democratic Equality:** The principle of "**one person, one vote**" ensures equal say for all members, irrespective of their stake.
  - **Enhanced Bargaining Power**: Collectivism enables members to negotiate better prices, wages, or opportunities.
  - **Nurturing Leadership:** Democratic elections within cooperatives nurture leadership skills.
    - **Eg: In Maharashtra, many political leaders have emerged from the cooperative movement.**
- **Advancing Financial Inclusion**: Cooperatives provide affordable credit to rural populations, particularly farmers, helping reduce dependency on exploitative moneylenders. Their widespread presence in rural areas makes financial services more accessible.
- **Addressing Wealth Disparities:** By offering low-interest loans and supporting self-employment, cooperatives empower economically weaker sections and promote equitable growth.
- **Upholding Ethical Values:** Cooperative functioning instills values of trust, solidarity, honesty, and collaboration, contributing to long-term social harmony and stability.

Key Challenges Confronting Cooperatives in India

1. **Governance-Related Issues**
   - **Excessive Government Control**: Stringent regulations on borrowing, financial transactions, and investments often hamper operational autonomy and decision-making.
   - **Political Influence:** Local political leaders frequently dominate cooperative bodies, undermining democratic functioning.
   - **Lack of Awareness**: Many members and even elected directors lack understanding of the cooperative's core principles, roles, and responsibilities.
   - **Internal Conflicts:** Disputes and factionalism within cooperatives discourage member participation and weaken collective efforts.
2. **Limited Reach and Structural Inefficiencies**
   - **Regional Disparities:** The cooperative movement remains weak in many northeastern and eastern states, leading to uneven development.
   - **Small Scale Societies:** Limited membership and financial resources restrict the ability of many cooperatives to expand and make a larger impact.
   - **Narrow Operational Scope**: Many cooperatives are single-purpose entities, lacking integrated solutions for broader community needs.
3. **Operational and Coordination Challenges**
   - **Ineffective Audit Mechanism**: Cooperative audits are often irregular, delayed, and lack thoroughness, leading to poor financial oversight.
   - **Lack of Inter-Cooperative Coordination:** Different tiers of cooperatives—primary, district, and state-level—often function in isolation, limiting synergy and resource optimization.
4. **Functional and Capacity Constraints**
   - **Inadequate Scale and Resources**: Many cooperatives face constraints in terms of financial capital, managerial capability, and technical infrastructure.
   - **Shortage of Skilled Personnel:** There is a lack of adequate training institutions and limited opportunities for professional development, affecting performance.
   - **Weak Leadership and Management:** Limited incentives and career paths within cooperatives discourage talent retention and reduce operational efficiency.
   - **Digital Divide**: Only about 45% of cooperative members are proficient in using digital tools, reflecting a significant technological literacy gap.

Major Initiatives to Strengthen the Cooperative Sector in India

1. **Institutional Support**
   - **National Cooperative Development Corporation (NCDC), 1963:** A statutory organization under the Ministry of Cooperation, focused on financing and supporting cooperative initiatives across sectors.
   - **Ministry of Cooperation (2021)**: Formed to provide dedicated policy focus, strengthen the cooperative movement, and promote rural economic development.
   - **National Cooperative Policy (Upcoming):** A National Committee has been constituted to draft a new cooperative policy under the vision of 'Sahkar Se Samriddhi', aiming to guide the sector's sustainable growth.
2. **Legal and Governance Reforms**
   - **Multi-State Cooperative Societies (Amendment) Act, 2023:** Introduced to improve governance, transparency, and democratic functioning, including reforms in electoral processes of multi-state cooperatives.
   - **Model Bye-Laws for PACS:** Standardized governance framework designed to enhance accountability and management in **Primary Agricultural Credit Societies (PACS)**
3. **Economic and Infrastructure Development**
   - **Pilot Project – World's Largest Grain Storage Plan**: Integrates PACS storage facilities into the national food supply chain, bolstering food security and rural economic activity.
   - **Margdarshika Plan**: Targets the establishment of 2 lakh new cooperatives across PACS, dairy, and fisheries sectors, expanding the cooperative footprint in rural India.
   - **SOPs for 'White Revolution 2.0'**: Focuses on women-led growth in the dairy sector, with a goal to scale milk procurement to 1,000 lakh kg/day by 2029.

4. **Technological Integration and Financial Inclusion**
   - **National Cooperative Database (NCD):** A centralized platform compiling state-wise and sector-wise data to support evidence-based policymaking.
   - **Umbrella Organization for Urban Cooperative Banks (NUCFDC):** A proposed Self-Regulatory Body to enhance oversight and efficiency in urban cooperative banking.
   - **SOPs for 'Cooperation among Cooperatives':** Encourages inter-cooperative collaboration and promotes financial inclusion, such as facilitating bank account access for cooperative members.

Strengthening the Cooperative Movement in India

1. **Structural Reforms**
   - **Consolidate Weak Cooperatives**: Merge underperforming cooperatives with stronger ones to consolidate resources, improve financial viability, and enhance service delivery.
   - **Promote Multipurpose Cooperatives**: Encourage the formation of cooperatives that cater to multiple needs of members—such as credit, marketing, storage, and input supply—for holistic and integrated development.
   - **Improve Operational Efficiency:**
     - **Appoint professionally trained managers** in core areas like finance, business operations, and governance.
     - **Ensure loans are productively utilized** and repaid promptly to maintain financial discipline.
     - **Strengthen coordination** across cooperatives at village, district, and state levels to foster collaboration and resource sharing.
     - Streamline functioning by simplifying procedures and recruiting skilled administrators.
2. **Capacity Building**
   - **Skill Development Programs:** Provide structured training to cooperative employees, students, and aspiring entrepreneurs in areas like cooperative governance, financial literacy, and management.
   - **Digital Transformation:** Adopt digital technologies for cooperative governance, banking, accounting, and marketing to improve efficiency, accountability, and transparency.
3. **Public Awareness and Education**
   - **Mass Outreach Initiatives:** Launch large-scale awareness campaigns such as **Jan Andolan's** to educate citizens about the benefits and functioning of cooperatives.
   - **Ethics and Values Education**: Integrate value-based education in schools and colleges to foster a culture of cooperation, honesty, and collective responsibility from an early age.
4. **Legal and Governance Reforms**
   - **Strengthen the Legal Framework**: Implement recommendations of expert bodies like the Narasimham Committee to reform cooperative banking and improve regulatory oversight.
   - **Ensure Greater Transparency and Accountability:**
     - Bring cooperatives under the **Right to Information (RTI) Act.**
     - Allow **inquiries by agencies like the CBI and CVC** in cases of financial misconduct.
     - Improve the internal audit system and introduce concurrent audits to mitigate risk and foster professionalism.
     - **Support from NABARD in developing a Cooperative Governance Index (CGI)** will help monitor and upgrade governance standards in rural cooperative banks.

Multi-State Cooperative Societies (Amendment) Act, 2023

The **Multi-State Cooperative Societies (MSCS) (Amendment) Act & Rules, 2023** strengthen governance, enhance transparency, increase accountability and reform electoral processes in the Multi State Cooperative Societies by supplementing existing legislation and incorporating the provisions of **Ninety-seventh Constitutional Amendment.**

Multi-state cooperative societies act ensuring transparency in cooperative societies

- **Election process:** To ensure timely, regular and transparent conduct of elections in the multi-State cooperative societies, provision of Cooperative Election Authority has been included.
- **Grievance redressal:** Appointment of Co-operative Ombudsman by Central Government to provide a mechanism to address grievances of members.
- **Information dissemination:** To improve transparency, appointment of Information Officer by multi-State cooperative societies to provide information to members.
- **Auditing:** Concurrent Audit has been introduced for Multi-State Cooperative Societies with turnover/deposits of more than 500 crore rupees from a panel of auditors approved by the Central Registrar.

- **Composition of board of directors:** With a provision of a maximum number of 21 directors, there needs to be one scheduled caste or scheduled tribe member alongside two women members in the board of directors.

Limitations in the provisions of the Multi-state cooperative societies act

- **Sick multi-state co-operative societies**: They would be revived by a fund that will be financed through contributions by profitable multi-state co-operative societies.
  - **Impact**: It imposes a cost on well-functioning or profitable societies.
- **Shareholding crunch:** The Act provides that the central government may give directions and supersede the boards of malfunctioning multi-state co-operative societies, where the central government has a shareholding of at least 51%.
  - **Impact**: It may go against the cooperative principles of autonomy and independence.

Remedial measures to address the cause of cooperatives in India

- **Strengthening democratic functioning**: The cooperatives autonomy and democratic functioning can be maintained by reducing the interference and control of the government and political parties.
- **Enhancing resource mobilisation**: To enable capital formation of cooperatives by enabling them to access various sources of funds such as equity, debt, grants, and subsidies.
- **Promoting capacity building**: The value of professionalism can be imbibed in cooperatives by attracting and retaining competent managers, staff, and members. It involves providing training, education, and awareness programs for co-operatives.

The High-Powered Committee on Cooperatives recommended that as far as possible, government aid to co-operatives could be provided as grants or interest free loans. In the **words of PM Modi, 'Cooperatives are the spirit of Atma Nirbhar Bharat'**. The proposed amendments to the Act are in line towards improving governance, transparency, and efficiency within the cooperative sector.

Women in Panchayati Raj Institutions (PRIs)

Syllabus Mapping: GS2: Powers, Finances, Challenges at local level

Context

Recently 29 Women led gram panchayats were chosen as model villages in Bihar showcasing the shift **from 'development for women' to 'women led development'.**

Introduction

The 73rd Constitutional Amendment Act of 1992 was a landmark in India's journey toward democratic decentralization, as it formally established Panchayati Raj Institutions (PRIs). It mandated a minimum of 33% reservation for women across all tiers—Gram Panchayats, Block Samitis, and Zilla Parishads—which was later raised to 50% by several progressive states.

Data on Women in PRIs

- **Widespread Representation:** India has over 1.45 million elected women representatives (EWRs) across approximately 2.5 lakh Panchayats, accounting for more than 46% of all elected members. (2023-2024)
- **Constitutional Mandate:** The 73rd Constitutional Amendment Act mandates 33% to 50% reservation for women in PRIs, significantly enhancing their participation in grassroots governance.
- **States with 50% Reservation:** Several states—including Bihar, Madhya Pradesh, Chhattisgarh, Rajasthan, Odisha, Maharashtra, and Kerala—have proactively implemented 50% reservation for women in Panchayati Raj bodies.
- **Gender Gap Report, 2023:**
  - **New Indicator Introduced**: For the first time, the Global Gender Gap Report 2023 included women's participation in local governance as a key metric.
  - **India's Performance:** Globally, only 18 out of 146 countries have achieved over 40% female representation in local governance.
    - India stands out among the top performers, with over 44% participation of elected women in PRIs

Role of women in PRIs

- **Participation in Elections:** The Act mandates the reservation of at least one-third of total seats for women, aiming to enhance their involvement in the electoral process, both directly and indirectly. This initiative serves as a foundational platform for nurturing future women leaders in national politics.
  - It has also led to a notable increase in civic engagement among ordinary women, with attendance at Gram Sabha meetings rising significantly—reported between 68% and 78%.
- **Participation in Rural Development:** Women are contributing to rural development across all levels, ranging from grassroots labor roles to policy-making positions. Their active involvement reflects a growing recognition of their capabilities and their integral role in shaping rural progress.

- **Participation in Decision-Making:** The reservation of seats for women has notably increased their participation in decision-making processes, both as elected and non-elected members. This affirmative action has served as a catalyst, encouraging women to engage in local meetings and discussions, where they voice their opinions and suggest solutions to community issues.
- **Agents of Social Transformation:** Women are emerging as powerful agents of societal change, challenging social norms and speaking out against injustice and discrimination. Their leadership is reshaping traditional structures and empowering communities to adopt more inclusive practices
- **Curbing Corruption and Local Violence:** The increased presence of women in local governance has disrupted long-standing alliances between bureaucrats and male politicians. This shift has contributed to a notable reduction in corruption. Furthermore, the influence of local strongmen has diminished as women become more aware of their rights and exercise their authority more assertively.
- **Reducing Violence Against Women:** Incidents of domestic violence have seen a significant decline in areas where women serve as sarpanch or pradhan. Women representatives often take a proactive stance in addressing such issues, creating a safer and more responsive environment where victims feel more comfortable reporting their grievances.
- **Mitigating Caste-Based Violence:** The entrenched dominance of upper-caste patriarchs has weakened, leading to a decline in caste-based discrimination. The growing participation of women, especially from marginalized communities, is dismantling barriers of casteism and promoting greater social equity.
- **Fostering Participatory Democracy:** The increasing involvement of women and other marginalized groups is transitioning the Indian democratic system from a predominantly representative model to a more participatory one. This evolution reflects a deeper engagement of citizens in governance and decision-making processes, reinforcing democratic values at the grassroots level.

Challenges associated with Women in PRIs

- **Patriarchal Constraints:** Many women are discouraged or outright prevented from contesting elections. Even when elected, they often serve as proxies for male relatives. Gender insensitivity from male colleagues, domestic responsibilities, the purdah system, and domestic violence further hinder their effective participation.
- **Inadequate Capacity Building:** Most women enter public life for the first time through PRIs, often lacking the necessary knowledge and skills. Government training initiatives are insufficient in coverage and timeliness, leaving many underprepared.
- **Community Resistance and Violence:** Women face stronger societal resistance, especially when they attempt progressive reforms. This includes intimidation and violence from entrenched power structures.
- **Two-Child Norm Restrictions:** States like Odisha and Rajasthan impose a two-child norm for contesting panchayat elections. Given limited reproductive agency in rural settings, such regulations disproportionately exclude women.
- **Caste-Based Discrimination:** Women from Scheduled Castes and Scheduled Tribes often struggle to assert autonomy and influence due to entrenched caste hierarchies
- **Absence of Female Support Networks:** The scarcity of female colleagues and mentors at higher administrative levels restricts peer support and hampers confidence and autonomy.
- **Dual Burden of Responsibilities:** Balancing household duties with public responsibilities creates significant stress and limits their administrative effectiveness.
- **Security Concerns**: Safety issues deter women from traveling to remote or unsafe areas, especially during odd hours. The increasing criminalization of politics adds to their vulnerability.
- **Lack of Experience and Knowledge:** Newly elected women often lack adequate information, governance skills, and clarity about their roles, making them susceptible to power usurpation by male counterparts.
- **Deficit in Leadership Skills**: Limited exposure and confidence hinder women's ability to voice opinions or influence decisions.
  - Studies suggest that 77% of women in PRIs feel powerless to effect meaningful change.
- **'Sarpanch Pati' syndrome**: In many instances, elected women remain figureheads while their husbands exercise real control, undermining genuine female leadership

Way forward

1. **Legal Reforms and Institutional Strengthening**
   - Ensure strict enforcement of the 73rd Constitutional Amendment through robust monitoring mechanisms.
   - Establish dedicated Women's Help Desks at Block and District levels for grievance redressal.
   - Recognize and incentivize efforts to combat proxy leadership through awards such as "Anti-Pradhan Pati Champions."
2. **Capacity Building and Education**
   - Provide targeted digital literacy and governance training to all elected women representatives.

- Launch gender sensitization campaigns to reshape community attitudes towards women in leadership.
- Consider instituting a minimum educational qualification (e.g., Class 12) for sarpanches to enable informed and independent decision-making.

3. **Financial and Administrative Empowerment**
   - Facilitate direct transfer of funds to women leaders to ensure financial independence.
   - Streamline administrative procedures and reduce bureaucratic hurdles to support effective governance.
4. **Political and Community Support**
   - Encourage senior women leaders to mentor first-time representatives.
   - Strengthen grassroots support networks like Self-Help Groups (SHGs) and Mahila Panchayats to empower women functionaries.
5. **Showcasing Role Models**
   - **Chhavi Rajawat (Rajasthan):** India's first MBA sarpanch, known for initiatives in rainwater harvesting and digital literacy.
   - **Minati Barik (Odisha):** Instrumental in improving sanitation, healthcare, and women's safety in her panchayat.

Enforcement Directorate (ED)

Syllabus Mapping: GS2: Statutory, Regulatory and various Quasi-judicial bodies

Context

Recent summons were issued by the ED to senior lawyers Arvind Datar and Pratap Venugopal for rendering legal advice to a corporate client concerning the employee stock option plan granted by M/Care Health Insurance Ltd. The event throws light on the autonomy of the legal provision and a direct threat to the independence of the administration of justice.

About ED

The Enforcement Directorate (ED) is a key investigative agency in India responsible for probing money laundering and foreign exchange violations. Over the years, its mandate has expanded to tackling a broader range of economic offences and safeguarding financial integrity. However, the agency has drawn criticism for the extensive scope of its powers and the potential for misuse, underlining the urgent need for reforms to ensure investigations are both fair and accountable.

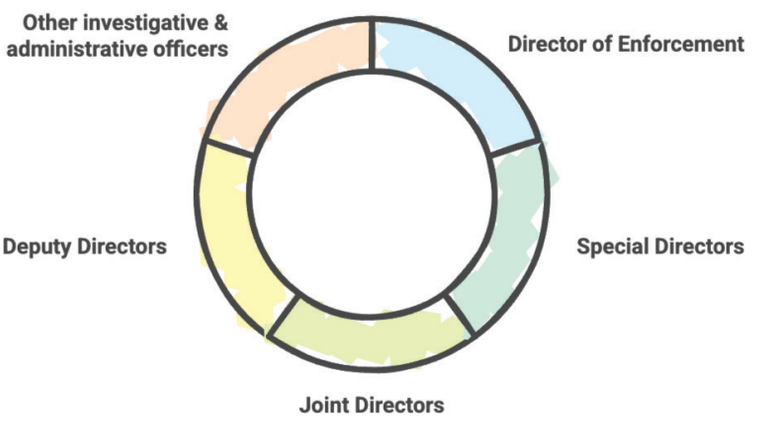
Evolution of ED

- **1956**: The "Enforcement Unit" was created within the Department of Economic Affairs, Ministry of Finance, to investigate violations under the Foreign Exchange Regulation Act, **1947 (FERA)**. It was headquartered in Delhi and led by the Director of Enforcement.
- **1957**: The Enforcement Unit was officially renamed as the Enforcement Directorate (ED).
- **1960**: Administrative control of the ED was shifted from the Department of Economic Affairs to the Department of Revenue, Ministry of Finance.
- **1973–1977:** During this period, the ED functioned under the Department of Personnel and Administrative Reforms.
- **1977**: The ED was brought back under the Department of Revenue, where it continues to operate today.

Key Functions of ED

- **Enforcement of Laws:** Implements the provisions of key financial legislations, including the Foreign Exchange Management Act (FEMA), the Prevention of Money Laundering Act (PMLA), and the Fugitive Economic Offenders Act (FEOA)
- **Investigation of Financial Offences**: Conducts investigations into a range of economic crimes, such as money laundering, foreign exchange violations, and banking frauds.
- **Exercise of Investigative Powers**: Has the authority to arrest individuals, conduct searches and seizures, and summon documents and individuals for questioning during the course of its investigations.
- **Inter-agency Coordination:** Collaborates with other enforcement and regulatory bodies, including the Central Bureau of Investigation (CBI), Income Tax Department, and Customs Department, to address complex economic offences.

Organizational Structure of ED



Statutory Functions of ED

1. **Prevention of Money Laundering Act, 2002 (PMLA)**
   - A criminal statute aimed at curbing money laundering and enabling the confiscation of assets derived from such activities.
   - The ED is entrusted with: Investigating the origin and movement of illicit assets.
     - Provisionally **attaching properties linked to proceeds of crime**
     - Assisting in the prosecution of offenders and facilitating confiscation of assets through designated Special Courts.
2. **Foreign Exchange Management Act, 1999 (FEMA)**
   - A civil law enacted to regulate foreign exchange transactions, facilitate external trade and payments, and promote a stable foreign exchange market.
   - **The ED's responsibilities under FEMA include:**
     - Investigating suspected violations of foreign exchange rules.
     - Conducting adjudication proceedings.
     - Imposing penalties on individuals or entities found guilty of contravention.
3. **Fugitive Economic Offenders Act, 2018 (FEOA)**
   - Enacted to prevent economic offenders from evading legal proceedings by remaining outside Indian jurisdiction.
   - **Under FEOA, the ED is empowered to:**
     - Identify and attach properties of declared **Fugitive Economic Offenders (FEOs).**
     - Facilitate the confiscation of such assets and ensure they are transferred to the Central Government

Composition and Structure of the ED

Recruitment of ED Officials

The ED recruits officers through two main channels:

- **Direct recruitment**
- **Deputation from other government services**, particularly:
  - Indian Revenue Service (IRS)
  - Indian Police Service (IPS)
  - Indian Administrative Service (IAS)

Director of Enforcement Directorate

- The Director is the head of the ED and is responsible for overall administration, supervision, and strategic direction of the agency.

Appointment of the Director

- The appointment is governed by the **Central Vigilance Commission Act, 2003 (CVC Act).**
- The Central Government appoints the Director based on the recommendation of a **high-level committee** comprising:
  - Central Vigilance Commissioner (CVC)
  - Vigilance Commissioners
  - Secretaries from the Ministries of Home Affairs, Personnel, and Finance
- Under the CVC Act, 2003, the **Director has a fixed tenure of 2 years.**

Associated challenges and its impact

- **Scope and Overreach:** The ED has been accused of stretching its jurisdiction to cover ordinary crimes beyond its legal mandate.
  - **Impact**: This dilutes the agency's core function and raises concerns over arbitrary use of power.
- **Lack of Transparency in Investigations:** The Enforcement Case Information Report (ECIR) is treated as an internal document, with little public disclosure or clarity on how cases are chosen.
  - **Impact**: Erodes trust in the investigative process and raises questions about fairness.
- **Alleged Political Misuse:** The ED is often accused of being used as a tool to target political opponents under the pretext of financial scrutiny.
  - **Impact**: Undermines the agency's neutrality and damages public confidence.
- **Harsh Penalties for False Complaints:** High penalties for filing false or frivolous complaints, particularly against public servants.
  - **Impact**: Discourages even genuine complainants from coming forward due to fear of retaliation.
- **Ban on Anonymous Complaints:** Only formally identified complaints are allowed.

  - **Impact**: Limits whistleblowing and inhibits reporting of sensitive issues like corruption.
- **Lack of Transparency in Handling Complaints Against the PM:** The process for investigating complaints against the Prime Minister lacks public transparency.
  - **Impact**: Raises concerns about accountability at the highest levels of government,
- **No Suo Motu Powers:** The ED cannot initiate investigations on its own without an external complaint or referral.
- **Procedural Formalism in Complaint Filing:** Greater focus on technicalities of complaint filing rather than the substance of the issue.
  - **Impact**: Creates barriers for complainants and diverts attention from addressing the core problems.

Way Forward

- **Enhance Clarity and Transparency:** Introduce clear, standardized guidelines for case selection and investigation procedures.
- **Uphold Due Process**: Ensuring fairness and procedural integrity in investigations is essential. Accused individuals should be granted access to the Enforcement Case Information Report (ECIR) or equivalent documentation to enable a fair defense and promote an equitable legal process.
- **Establish Independent Oversight:** To address concerns about political misuse or overreach, an independent oversight body should be created or strengthened.
- **Focus on Training and Ethical Conduct:** Regular training and capacity-building for ED personnel is vital to promote a multidisciplinary and legally sound approach.
- **Promote Data Transparency and Public Reporting:** Publishing comprehensive data and performance metrics—including case numbers, conviction rates, asset recoveries, and investigation timelines—would significantly improve transparency and allow public scrutiny of the agency's effectiveness.

TOPICS FOR PRELIMS

President's Rule

Context

A group of 10 MLAs from the Manipur Assembly recently met with the State Governor to urge the formation of a stable government. Manipur has been under President's Rule since February 2025.

About President Rule

Constitutional provisions regarding President Rule

- **Article 355:** Duty of the Centre to ensure that the government of every state is carried on in accordance with the **'provisions of the Constitution'.**
- **Article 356:** President can issue a proclamation that the government of state cannot be carried in accordance with the 'provisions of the constitution'. **(can act with or without a Governor's report).**
- **Article 365:** Failure of state government to comply with the directions of the Centre → President can hold that State government cannot be carried in accordance with the 'provisions of the constitution' → President's Rule

- **Approval:** Must be approved by both houses of Parliament **within two months** with a simple **majority**.
- **Duration:** After approval by both houses' emergency continues for **six months.**
  - It can be extended for a maximum period of **three years (Parliament approval every 6 months).**
- **Revocation:** President proclamation (No Parliamentary approval is needed).

Effects of President Rule

- The President is empowered to administer the state under the President's rule as it dismisses the State Council of ministers headed by the Chief Minister.
- The President can transfer State Legislature's powers to **Parliament.**
- It **does not impact** the functioning of the High Court.
- The President **can only dissolve a state legislative assembly after Parliament's approval of the proclamation**, and until then, the assembly remains suspended. **(SC in SR Bommai Case)**

Judicial Review and Landmark Case

- **S.R. Bommai Case (1994) – Landmark Judgement:**
  - **Judicial review** of the President's Rule is permissible.
  - **Political misuse** of Article 356 is **unconstitutional**.
  - **Legislative Assembly should not be dissolved** before **Parliamentary approval**; can only be kept under **suspended animation**.
  - Should be used only in **cases of constitutional breakdown**, not for ordinary law and order problems.
- **Other Examples of Judicial interventions:**
  - **Bihar (2005):** President's Rule struck down.
  - **Uttarakhand (2016):** President's Rule revoked by High Court.
  - **Arunachal Pradesh (2016):** SC reinstated the dismissed government.

Facts

- Article 356 was used for the first time while imposing the President's rule in **Punjab in 1951.**
  - **Manipur: maximum number of President rule - 11** (Including latest).
- Laws made by Parliament, President or any other specified authority **continue to be operative** even after the end of the President's Rule. **i.e.,** Laws are not **coterminous** with the duration of President's Rule
  - However such laws can be **altered or repealed** by the state legislature.

New Protections for Ladakh

Context

The Centre has notified new regulations for Ladakh

Background

- Ladakh became a **Union Territory (UT)** in **2019** after the abrogation of **Article 370** and the **J&K Reorganisation Act**.
- **Demand for Sixth Schedule**: Over **90% of Ladakh's population** belongs to **Scheduled Tribes (STs)**, leading to demands for **autonomy** under the **Sixth Schedule** (like Northeastern states).
- **Protests**: Led by **Leh Apex Body (LAB)** and **Kargil Democratic Alliance (KDA)**, including climate activist **Sonam Wangchuk's hunger strike**.

Key Provisions of New Regulations (2025)

- **Ladakh Civil Services (Amendment) Regulation, 2025: Domicile requirement** for govt jobs:
  - 15 years residency **OR**
  - 7 years of education in Ladakh + Class 10/12 exams.
  - Children of central govt employees (10+ years service) are also eligible.
  - **Issuing authority**: Deputy Commissioner.
- **UT of Ladakh Reservation (Amendment) Regulation, 2025**
  - **Total reservation capped at 85%** (SC/ST/OBC + socially backward groups).
  - **Excludes 10% EWS quota**.
  - **Professional colleges**: SC/ST/OBC quota raised from **50% to 85%**.
- **Ladakh Official Languages Regulation, 2025**
  - **Official languages**: English, Hindi, **Bhoti, Purgi**.
  - **Promotion of local dialects**: Shina, Brokkat, Balti, Ladakhi.
- **Ladakh Autonomous Hill Development Councils (Amendment) Regulation, 2025: 1/3rd seats reserved for women** (rotational basis) in **Leh & Kargil councils**.

Significance of the Regulations

- First **legal framework** for Ladakh since **2019 UT creation**.
- Addresses **job reservations**, **language recognition**, and **women's representation**.
- **Falls short of Sixth Schedule demands**:
  - **No land protection** (outsiders can still buy land).
  - **No legislative powers** for Hill Councils (only administrative).
  - **Executive orders (Article 240)** can be revoked (unlike constitutional safeguards).

Criticism & Pending Demands

- **No Sixth Schedule Status**: Lack of **constitutional autonomy**.
- **Land & Environment**: No safeguards against **tourism/ commercial exploitation**.
- **Domicile Duration**:Activists demand **30 years** instead of 15.

National Company Law Appellate Tribunal (NCLAT)

Context

NCLAT refused relief to Gensol Engineering Ltd. against an asset freeze order by NCLT (Ahmedabad).

About NCLAT

- **Establishment:**
  - It is a **quasi-judicial body** under the **Companies Act, 2013.**
  - Constituted under **Section 410** of the Companies Act, 2013.
  - Became operational on **1 June 2016.**
- **Purpose:**
  - Appellate tribunal for appeals against orders of:
    - National Company Law Tribunal (NCLT) - **[Adjudicates company law disputes (original jurisdiction)]**
    - Insolvency and Bankruptcy Board of India (IBBI).
    - Competition Commission of India (CCI).
- **Composition:**
  - **Chairperson:** Retired Judge of the Supreme Court or Chief Justice of a High Court.
  - **Members:** Judicial and technical experts.
- **Jurisdiction:**
  - Adjudicates matters related to company law, insolvency, and competition law.
  - Final appellate authority under the Insolvency and Bankruptcy Code (IBC), 2016.

Gensol Engineering Case

- **Issue:** NCLAT refused relief to Gensol Engineering Ltd. against an asset freeze order by NCLT (Ahmedabad).
- **Entities Involved:**
  - Matrix Gas and Renewable Ltd.
  - Blu Smart Fleet Private Ltd. (linked to Gensol).

- **Key Observation:** NCLAT directed the matter back to NCLT for reconsideration.

EC upgrades system to create Index Cards

Context

- The Election Commission of India (ECI) launched a major technological upgrade to the Index Card system.
- The upgraded Index Card system now generates:
  - 35 statistical reports for Lok Sabha (Parliamentary) elections
  - 14 statistical reports for State Assembly elections

What is the Index Card?

- It is a **comprehensive, constituency-level data record created after each election.**
- It contains detailed information such as candidate details, vote counts, party performance, gender-based voting patterns, regional voting variations, and other key statistics.
- While not a legally mandated (statutory) document, it is crucial for supporting electoral research, academic studies, and fostering informed democratic discourse.

Census

Context

The Union Home Ministry has announced the next Census will be conducted in two phases and that the reference date for Census enumeration would be March 1, 2027.

About Census

- **History of Census in India**
  - **Ancient References**: Population enumeration is mentioned in **Kautilya's Arthashastra** and **Abul Fazl's Ain-i-Akbari** during Akbar's reign.
  - **Modern Census Begins (British Era)**: The first **synchronous census** (data collected simultaneously across the country) was held in **1881** under **W. C. Plowden**, India's first Census Commissioner.
    - Subsequent censuses were held **every 10 years** without interruption till 2011.
  - **Post-Independence**: Censuses continued every decade; the last was in **2011**.
    - **Caste enumeration for Hindus** was last done in **1931**; post-independence censuses only captured **SC/ST data**.
- **How is the Census Conducted?**
  - **Legal Framework**: Governed by the **Census Act, 1948** (a Union List subject).
    - The **Central Government** appoints the **Registrar General and Census Commissioner** to lead the process.
  - **Operational Structure**: **Directors of Census Operations** are appointed in each state.
    - **State governments** provide staff (mostly **school teachers**) through local authorities.
  - **Two Phases of Operation (Since 1971)**:
    - **House Listing Phase** (5–6 months): Collects data on housing — type, facilities, assets, etc. **(35 questions in 2011)**
    - **Population Enumeration Phase** (typically in February): Captures demographic details — **name, age, sex, religion, mother tongue, literacy, occupation, caste (SC/ST)**, etc. **(Reference date is usually March 1 of Census year)**
- **Data Release**: **Provisional data** is released within a month.
  - **Final detailed reports** are released 1–2 years later (e.g., 2011 Census report in April 2013).

Significance of Upcoming Census

- **Caste Enumeration:** For the **first time post-Independence**, caste data for all Hindus may be included, addressing long-standing political and social demands.
- **Delimitation Basis**: Will serve as the **basis for redrawing Lok Sabha and State Assembly constituencies** after the freeze ends in **2026**.
- **Women's Reservation**: The data will also facilitate the implementation of **one-third reservation for women** in legislatures.

Govt has not abandoned lateral entry to posts

Context

The government clarified that **lateral-entry recruitment** through UPSC is **not scrapped**, despite withdrawing an ad for 45 posts due to **reservation concerns**.

What is Lateral Entry?

- It is the appointment of **specialists from the private sector** or non-government organisations into the **middle and senior levels** of government.
- Meant to bring in **domain expertise** and address the **shortage of IAS officers**.
- Proposed by **NITI Aayog** in its **Three-Year Action Agenda**.
- Also recommended by the **Group of Secretaries (GoS)** on Governance.
- **Enhance domain expertise** in government policymaking and implementation.
- **Address shortage** of officers at key levels in central administration.
- Recruit professionals from fields like:
  - Revenue, Finance, Economic Affairs
  - Agriculture, Civil Aviation, Commerce
  - Road Transport, Rural Development, etc.

Recruitment Process

- Conducted by the **Union Public Service Commission (UPSC)**.
- Steps involved:
  - **DoPT** requests UPSC to initiate recruitment.
  - UPSC issues **online applications** for specified roles.
  - Shortlisted candidates are interviewed.
  - **Final selection list** is recommended to DoPT.
  - Appointments made for **3–5 years**.

50 years of Emergency

Context

50 years ago, on June 25, 1975, a national emergency was declared in India.

About Emergency Provisions

- Enumerated in **Part XVIII** of the Constitution. It mentions **3 types** of Emergencies;
  - National Emergency - **Article 352**
  - State Emergency (popularly known as President Rule) - **Article 356**
  - Financial Emergency - **Article 360**.
- **Article- 355:** It mandates the Centre to protect states from external aggression and internal disturbances, while ensuring that state governments function according to the Constitution.
- **Article- 356:** It grants Centre the power to impose President's Rule in a state if it fails to comply with **Constitutional norms.**
- **Effects of President Rule**
  - The President is empowered to administer the state under the President's rule as it dismisses the State Council of ministers headed by the Chief Minister.
  - The President can declare that the powers of the state legislature are to be exercised by the Parliament.
  - The President can take all other important steps including the suspension of the constitutional provisions relating to any authority in the state, **except provisions related to the High Court.**
- **Approval of the Constitutional Emergency by the Parliament**
  - Both Houses of Parliament must approve the proclamation of President's Rule within **2 months** of its issue
  - **Required majority:** Simple majority.
  - **Duration of the President Rule:** If approved by both the houses, the President's rule continues for **6 months**.

Did You Know?

- Article 356 was used for the first time while imposing the President's rule in **Punjab in 1951.**
- Laws made by Parliament, President or any other specified authority **continue to be operative** even after the end of the President's Rule. **i.e.,** Laws are not **coterminous** with the duration of President's Rule
  - However such laws can be **altered or repealed** by the state legislature.
- **Borrowed from various sources – Source: Provision**
  - **Germany:** Suspension of Fundamental Rights during the emergency
  - **Government of India Act 1935**: Emergency provisions

Legal and Defence counsel scheme (LADCS)

I. Scheme Approval and Funding

- Approved as a **Central Sector Scheme for FY 2023–24 to 2025–26**
- **Shift from Empanelled Lawyers to Full-Time Counsels:**
  - LADCS represents a paradigm shift in legal aid delivery—moving from part-time empanelled lawyers to full-time dedicated defence counsels.
  - This ensures exclusive, continuous, and quality legal representation in criminal matters.
  - Emphasis is placed on ensuring competent and dedicated lawyers are selected through a transparent and merit-based process.

II. Recruitment and Selection Process

- **Selection Committee Composition:**
  - Principal District & Sessions Judge (Chairman, DLSA)
  - At least three senior-most judicial officers (criminal jurisdiction)
  - Final approval by Hon'ble Executive Chairman, SLSA
- **Selection Criteria:**
  - Based on merit, experience, skills, and legal knowledge
  - Two-year contract, extendable based on performance

III. Performance Monitoring and Evaluation

- **Multi-level Monitoring Structure:**
  - District Level: Monitoring and Mentoring Committees (MMCs)
  - Monthly Reviews: By DLSA Chairman
  - Quarterly Reviews: By SLSA
  - Half-Yearly Reviews: By NALSA
- **Evaluation Parameters Include:**
  - Number of cases handled and disposed
  - Bail applications filed
  - Client counselling and representation effectiveness
- **Post-One-Year Impact Study:**
  - A comparative performance evaluation of LADCS offices to be conducted by NALSA

IV. Training and Capacity Building

- **Specialized Induction Training:**
  - Tailored training modules developed by NALSA
  - Covers criminal litigation, client counselling, and procedural role.
- **Refresher Training:**
  - Includes updates on new criminal laws
  - Regular sessions at State level.

ECONOMY AND AGRICULTURE

TOPICS FOR MAINS (ECONOMY)

Asset Monetisation Strategy for Road Sector

Syllabus Mapping: GS-Paper 3, Infrastructure

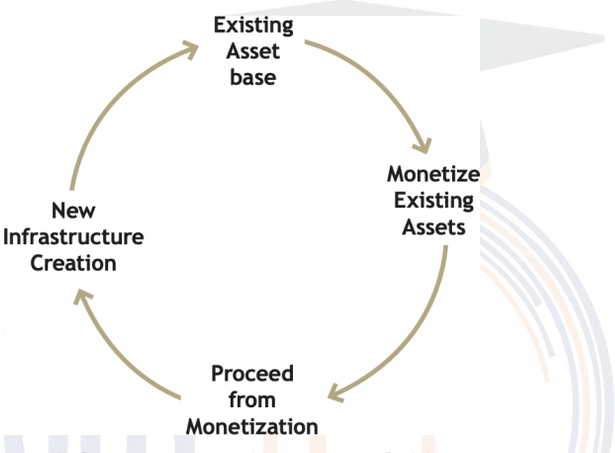
Context

NHAI has released a comprehensive road map for asset monetisation in the roads sector paving way for unlocking value and generating funds for further investment in the roads sector. NHAI has raised over Rs 1.4 lakh across using the asset monetisation strategies of Toll-Operate-Transfer, InvITs & Securitisation models under the National Monetisation Pipeline.

Asset Monetisation

Asset Monetisation (also known as asset or capital recycling) entails a limited period license/lease of a public sector asset to a private sector entity for an upfront or periodic consideration through a well defined concession or contractual agreement.

Note: Development of national highways has a multiplier effect on the economy by facilitating trade and increased overall economic development of a region.



(Infrastructure Asset Monetisation Cycle)

Importance/Significance of NHAI's Asset Monetisation Strategy

- Unlocking of economic value: Economic value of completed road assets is unlocked, leading to generation of funds for future investment in new road projects.
- Reducing fiscal pressure for road development: Traditional budgetary support from the Union Government and toll revenues accounted for funding development of National Highways in India. For example, In FY 24-25 budgetary support and toll revenues accounted for 93% of total funds with NHAI. Asset Monetisation will result in attracting private capital in the National Highway sector for further accelerating roads development.
- Efficiency improvement by:
  - Attracting private sector expertise in operations & management of road infrastructure
  - Boosting quality of roads due to better maintenance
  - Leverage of advanced technologies
  - Increased longevity road assets
- Ensuring trust, transparency & fair competition in asset monetisation
- by integration of better O&M and technologies by the private sector.
- Supporting National Monetisation Pipeline
- Deepening of infrastructure financing ecosystem

Asset Monetisation Strategies Employed by NHAI

1. **Toll - Operate - Transfer (TOT):** This model is structured to attract private capital for management of completed projects, in exchange for toll collection rights. The concessionaire pays a lump sum amount to NHAI at the start of concession and also undertakes operations & management obligations for the asset during the duration of concession period.

Benefits to NHAI

- Upfront payment of concession fee leading to quick infusion of capital for future roads development.
- Efficiency in O&M with the private sector bringing best practices to enhance road user experience, road longevity and safety.

2. **Infrastructure Investment Trusts (InvITs):** InvIT is a pooled investment vehicle that raises funds from investors by issuing units. Infrastructure asset owners use InvITs to pool funds from a diverse set of investors, who receive cash flow generated by the assets periodically. They are regulated by the SEBI.

Benefits of InvITs

- Stable and predictable cash flows.
- Low risk
- Liquidity
- Diversification
- Tax benefits to investors
- Confidence & trust as regulated by SEBI

3. **Securitisation of Projects:** Under this strategy, NHAI raises long term finance from banks by securitising user fee receipts from toll plazas. For example, for the construction of 1,337 km Delhi-Mumbai Expressway, NHAI has formed a Special Purpose Vehicle (SPV) to securitize the corridor's future revenues and raise funds for its development and raised Rs 40,000 crores through this mechanism.

Outline of NHAI's Asset Monetisation Strategy 2025-30

The objective of NHAI's Asset Monetisation Strategy is to:

- **Streamline processes:** Strategy for simplification and standardization of processes involved in asset monetization.
- **Enhance transparency:** Measures to enhance transparency in all transactions and operations.
- **Mitigate risks:** Identification of potential risks associated with asset monetization and develop strategies for risk mitigation.

The three pillars of NHAI's asset monetisation strategy are: (i) Value Maximisation (ii) Transparency (iii) Market Development.

1. **Value Maximisation:** Ensuring maximisation of value of public assets by creating standardised processes to identify and offer attractive assets for monetisation.

- **Creation of Asset register:** Identification of list of highways which will be attractive for investors to participate in NHAI's asset monetisation program. Criteria for filtering out assets to be included in asset register:
  - Age of Asset: Already operation for at least 1 year enables assessment of operational and financial history.
  - Nature of stretch: Complete with no requirements for enhancement works in near future.
  - Revenue: Should have significant toll revenue to sustain positive cashflows and returns for concessionaires. Assets with toll revenue more than Rs 0.8 cr/km to be considered.
  - Historic Revenue Growth: Assets should have steady and stabilized revenue growth for reducing unpredictability and risk and increasing bankability for investors. Thus, assets with a stable pattern of traffic growth will be offered.
- **Technical & Traffic evaluation of the asset:** Result in maximisation of value of the asset and also highlight issues that may come in monetisation of the asset to be addressed well in advance.
  - Technical investigations to be done by using drone videography, mobile LIDAR surveys, axle load surveys, and network survey vehicles (NSV). Spatial planning platforms such as the PM Gati Shakti National Master Plan portal will also be leveraged.
  - Traffic volume count survey tol be done on the asset to determine its traffic volumes, which will in turn feed into the calculation of the project's Initial Estimated Concession Value (IECV).
  - Asset Monetisation Cell of NHAI will be employed for conducting technical and commercial evaluations.
- **Transaction Value of ToT bundles:** To maximise the value attributed to NHAI, Free Cash Flow to Firm (FCFF) method will be employed.
- **Categorisation of Assets:** Following the traffic and technical assessments, assets will be categorised into various classes based on toll revenue per km and toll revenue growth rate. These classes will help in creating a balanced bundle of assets.

- **Identification of monetisable assets:** Shortlisted assets will be pooled together to create bundles of sizable value which are attractive to investors. The bundles will be created with the aim to balance immediate returns with future growth, preferably located to provide geographical advantages and the sizes of bundles will be varied to suit the needs of different segments of investors.
- **Execution of monetisation process:** Following the creation of bundles, an assessment will be made as to which route to be employed for monetisation - Toll Operate Transfer or InvIT.
- **Timing & frequency of operations:** Bundles will be issued on an annual basis by NHAI, depending on prevailing market conditions following assessment of market capacity & due diligence.

2. **Transparency:** Essential for building trust among investors. These strategies focus on building transparency both within NHAI and in communications with investors.

- Standardisation & Dissemination of Processes & Documents across the value chain, including pre and post bidding stages.
- Public dissemination of relevant investor information about NHAI's future monetisation pipeline, macro-economic factors, assumptions for estimating future toll revenues for monetisation bundles.
- Asset Monetization Cell set up by NHAI will be used as the information backbone for NHAI for managing the dissemination of information by:
  - Public disclosure of future monetisation pipeline.
  - Full disclosures of assumptions made to arrive at IECV.
  - Continuous monitoring and performance evaluation by establishing KPIs, regular reporting and review, risk monitoring and mitigation and feedback mechanisms.

3. **Market Development:** Aims to (i) broaden investor base to attract more private participation (ii) enhance stakeholder engagement to increase traction of NHAI's asset monetisation.

- Launching Public InvITs: NHAI is considering launching a public InvIT to increase overall investor base, increase retail participation in the infrastructure sector, develop a competitive environment in InvIT market, and mitigate the risk of limited investor base.
- Offering Multiple Bundle Sizes: NHAI already has initiatives underway to increase the number and volume of ToT bundles and InvIT phases by offering three ToT bundles per quarter and conducting one/two InvIT phases.
- Improving Risk-Reward Mechanism for Concessionaires: Creating mechanisms for hedging risks of investors. For example model concession agreement for ToT, concessionaires are only expected to absorb risk of traffic variation up till 5%.
- High Quality Institutional Investment: Targeted outreach programs across geographic locations and investor profiles to attract high quality investors with expertise in the infrastructure sector.
- Periodic review of existing policies: Regular engagement with investors to understand investors' concerns and revise MCA/ bidding process.
- Developing impactful 'value proposition' by producing compelling communication material that highlights socio-economic benefits such as improved connectivity, job creation & economic growth.
- Expand outreach base: networking at international conferences, business events, roadshows and seminars.
- Collaborate with financial intermediaries such as mutual funds, investment banks etc.

Challenges and opportunities for Indian Economy

Syllabus Mapping: GS-Paper 3, Indian Economy, Issues of Growth

Context

India's economy, projected to grow at 6.5% in FY 2024–25, reflects resilience amid global uncertainties. However, challenges persist, requiring reforms and strategic investments to sustain inclusive and robust growth.

Recent Estimates: Indian Economy (2024–25)

- India's **GDP growth is estimated at 6.5%**, with **Q4 growing at 7.4%**, indicating robust momentum.
- **Nominal GDP** grew by **9.8%**, increasing the economy's size to **$3.91 trillion**.
- **Private consumption** rose **7.2%**, supported by rural demand, but urban demand remained weak.
- **Government consumption** grew by just **2.3%** for the full year and **contracted -1.8% in Q4**.
- **Manufacturing** underperformed with only **4.5% growth**, lower than the agriculture sector.
- **Construction** grew by **9.4%**, supporting employment and labour-intensive sectors.
- **Merchandise exports** were nearly flat (~$437 billion), while **services exports** remained resilient.
- **Forex reserves** remain strong at **$686 billion**.

- **Capital expenditure** touched ₹1.59 lakh crore in April 2025 (14.3% of full-year budgeted capex).
- **Income Inequality:** Gini coefficient stable (~0.33–0.35), showing only moderate improvement.
- **Low Per Capita Income Globally:** India ranks lowest among G20 nations, below Sri Lanka and Bhutan in PPP per capita terms.

Changes in India's Economy (2014–2025)

- **Nominal GDP Growth:**
  - 2014: **$2.04 trillion**
  - 2025: **$4.19 trillion** (doubled in 11 years)
- **PPP-based GDP Expansion:**
  - 2004: **$2.75 trillion**
  - 2014: **$6.45 trillion**
  - 2025: **$17.65 trillion** (3rd largest globally)
- **Per Capita Income in PPP terms improved:**
  - 2004: **$2,424.2**
  - 2014: **$4,935.5**
  - 2025: **$12,131.8**

Subsidy Inefficiencies: Large spending on **food subsidy (Rs 2.03 lakh crore)** and **fertiliser subsidy (Rs 1.56 lakh crore)**, yet facing significant leakages and inefficiencies.

- **Significant Poverty Reduction:** Extreme poverty (at $3/day) reduced from **27.1% in 2011 to 5.3% in 2022**.
  - Poverty at $4.20/day dropped from **57.7% to 23.9%** during 2011–2022.

Current Situation in Global Trade

- **Resurgence of Trade Wars:** Countries are imposing or reviewing tariffs, especially the U.S. on strategic imports.
- **Proliferation of Bilateral Trade Agreements (BTAs):** Shift from multilateralism to **mini deals and FTAs**, making trade rules more fragmented.
- **Geopolitical Tensions:** Conflicts (e.g., U.S.-China, Middle East) are disrupting supply chains and raising shipping costs.
- **Supply Chain Realignment:** Global firms are adopting **'China +1' or 'friend-shoring'** strategies to diversify manufacturing bases.
- **India's Trade Exposure:** The U.S. is India's largest export market (~20% of merchandise exports).
  - Sectors like **gems & jewellery, pharma, auto parts, textiles** are highly dependent on the U.S.
- **Taxation over remittances:** USA is passing the Big Beautiful Bill which aims to tax the outward remittances from the USA to other countries, hurting developing countries like India.

Challenges Ahead

- **Global tariff tensions** (e.g., US-China, US-India) threaten India's export competitiveness and disrupts planning and pricing for Indian exporters.
- **Slowing global economy** (S&P forecasts 2.7% global growth in 2025 vs 3.3% in 2024) leads to a low demand environment for Indian exports.
- **Export market risks**, including reduced demand from the US, EU, and Asia.
- **Dumping Risk in India:** Countries like China may divert excess output to India, **hurting domestic industries**.
- **Private investment delays** due to policy and global uncertainties.
- **Urban consumption remains weak**, limiting overall demand growth.
- **Volatility in capital flows and currency rates** may continue.
- **Structural bottlenecks** still hamper ease of doing business and logistics efficiency.
- **Reduced remittance income** due to taxation in the USA. India is the largest recipient of remittances in the world ($135 billion), thus, taxation of remittances will hurt the current account balance and incomes of families.

Opportunities

- **Services exports** (nearly 50% of total exports) are less sensitive to global trade shocks.
- **Record agricultural output** and good monsoon prospects may boost rural incomes and control food inflation.
- **Crude oil prices are expected** to average **$65/barrel**, reducing import bill and inflation.
- **RBI may cut rates** (expected two rate cuts of 25 basis points) to support growth.

- **Foreign investments increasing**: Apple and Vietnamese EV firms expanding in India.
- **Strong corporate balance sheets** enhance India Inc.'s ability to leverage new opportunities.
- **Early push in capital expenditure** suggests the government prioritizes growth through infrastructure.

Way Forward for Indian Economy

Steps to be taken in domestic front

- **Undertake structural reforms** in factors of production like land, labour, and logistics to attract long-term investments.
- **Improve investment climate** through stable policies and reduce compliance burden.
- **Enhance rural demand** via targeted welfare and support for agri-value chains.
- **Ensure fiscal prudence** while maintaining productive government spending.
- **Promote employment-intensive sectors** such as construction, MSMEs, and manufacturing.
- **Promoting employment intensive low-cost manufacturing** which can absorb and provide employment to low-skilled workers moving out from the agricultural sector.
- **Focussing on new economies and technologies** such as Artificial Intelligence, Semiconductor, Green transition, biotechnology, materials, battery technology, etc. by way of fiscal incentives like PLI.
- **Investment in human capital** by focusing on universalisation of quality primary education, skills for the new economy and healthcare to improve productivity. India's large skilled workforce is a driver of India's **increasing service exports.**
- **Subsidy Rationalisation (Food & Fertiliser):** Shift from free grains distribution to targeted **digital food coupons** for nutritious foods (milk, pulses, eggs).
  - Replace fertiliser subsidy with **digital fertiliser coupons**, promoting balanced fertiliser use and natural farming.
  - Deregulation of the fertilizer sector to encourage innovation.
- **Environmental Sustainability:**
  - India's focus is on green energy transition by boosting renewable energy output, low-carbon technologies, green hydrogen etc.
  - Promote organic and natural farming practices through incentives.

Steps to be taken on external sector front

- **Supply Chain Diversification:** India can emerge as a **key alternative manufacturing base** for global companies.
- **First-Mover in U.S. BTA:** Early conclusion of a trade deal with the U.S. can offer **competitive edge**.
- **Robust Services Sector:** India's IT and digital exports remain resilient and continue to grow.
- **Expanding FTA Network:** FTA with the **U.K. concluded**; talks with the **EU** ongoing.
- **Potential to Anchor Global FDI:** India can attract companies **relocating from China, Vietnam, etc.**
- **Diversify exports**, especially in digital and green sectors, to reduce global trade dependency.

Expansionary Policies In A Slowing Economy

Syllabus Mapping: Mobilisation of Resources

Context

Reserve Bank of India (RBI) has cut key lending rates in two successive meetings, indicating a significant expansionary shift.

Instances of RBI Lending Rate Cuts in 2025:

- **April 2025:** RBI reduced the **repo rate** by **25 basis points (bps)**.
- **June 2025:** A further **50 bps cut** was announced.
  - **Current repo rate: 5.5%**

What is Expansionary Policy in India?

- Expansionary policy refers to the use of **fiscal** and **monetary tools** to **stimulate economic growth**, especially when the economy is facing low demand, low growth, or recessionary trends.
- These policies principally aim to make access to money cheaper by way of reduced interest rates, incentivising borrowing or reducing taxation putting in greater amounts at disposal of individuals and firms for further investment & consumption.
- **There are two types of expansionary policies:**

1. **Expansionary Monetary Policy (RBI):**
   - Reducing **repo rates** to lower the cost of borrowing.

- Encourages **investment and consumption** by making loans cheaper.
- Also includes increasing liquidity in the banking system.

2. **Expansionary Fiscal Policy (Government):**
   - **Cutting income taxes** (as done in Feb 2025).
   - **Increasing public expenditure** to boost aggregate demand.
   - Providing incentives/subsidies for specific sectors.

Advantages of Expansionary Policy

- **Boosts Aggregate Demand:** Lower interest rates and tax cuts encourage households and firms to **spend and invest more**.
- **Revives Investment Activity:** Helps private sector, especially MSMEs, to access cheaper credit and **restart production**.
- **Reduces Unemployment:** Rising demand for goods and services increases the **demand for labour**, thereby reducing joblessness.
- **Counteracts Economic Slowdown:** Especially useful during **low inflation and low credit growth** (like in 2025), to **revive economic momentum**.
- **Supports Growth Projections:** Aims to maintain or enhance GDP growth (RBI projects **6.5%** for FY 2025–26).

Risks of Expansionary Policy

- **Inflationary Pressure:** Increased demand may lead to **higher prices**, especially if supply doesn't rise proportionately.
  - Could breach RBI's **targeted inflation band of 4% ± 2%**.
- **Fiscal Deficit Widening:** Tax cuts may reduce revenue without proportional increase in GDP, causing the **fiscal deficit to rise**.
  - May force the government to cut spending, especially on welfare schemes.
- **Policy Coordination Risk:** If both fiscal and monetary policies are expansionary without coordination, it may **destabilize macroeconomic balance**.
- **Delayed Impact:** Time lags in the transmission of monetary signals or implementation of fiscal measures may lead to **slow or uneven outcomes**.
- **Dependence on External Conditions:** Global headwinds (e.g. **Trump's tariff wars**, **Middle East conflict**) may offset domestic policy gains.
- **Uneven Benefits:** Expansionary policies may **disproportionately benefit corporates and high-income groups**, while vulnerable sections may lose out if the government cuts revenue spending.
- **Need not translate into investment outcomes:** An expansionary economic policy environment without the structural reforms might not translate into actual long-term investment.
  - For ex. Firms and individuals might use the ease money policies but boost consumption of imported goods etc.
  - Long term investments demand a stable policy environment, reforms in factor markets, greater global integration with supply chains etc.

Plateauing of FDI

Syllabus Mapping: GS-Paper 3, Mobilisation of Resources

Context

The RBI Bulletin (May 2025) provides foreign direct investment (FDI) figures for the fiscal year 2024-25. According to the report, the gross FDI flows in India have increased by 13.7% over the past year to reach $81 billion in 2024-25. However, when compared over a 5 year period, gross FDI inflows in India continue to be lower than the level in 2020-21. Gross FDI flows have increased at a meagre rate of 0.3% in the post-pandemic years.

Trends of GDP

- **Diverging Figures:**
  - **Gross FDI inflows** reached **$81 billion** in FY25.
  - **Net FDI** fell sharply to **$353 million**, a **near-zero figure**.
- **Declining FDI Ratios:**
  - **Gross FDI-to-GDP** ratio declined from **3.1% (FY21)** to **2.1% (FY25)**.
  - **Net FDI-to-GDP** dropped from **1.6% to 0%** in the same period.
  - **FDI as % of Gross Fixed Capital Formation (GFCF)** peaked at **7.5% in FY21**, but declined steeply afterward.
- **Rising Disinvestment and Outward FDI (OFDI):**

  - Increased capital outflow due to disinvestment and Indian firms investing abroad.
  - A significant portion of OFDI goes to tax havens like **Singapore and Mauritius**.
- **Shift in FDI Composition:**
  - **Private Equity and Venture Capital (PE/VC) funds** now dominate FDI, forming **over 75.9%** of inflows by FY21.
  - **Greenfield FDI** (new projects) has seen a steady decline.

Reasons For The Divergence

- **High Repatriation and Disinvestment:** Over half of FDI inflows were sent back out via dividends, share sales, or exits.
  - PE/VC funds, with short-term horizons (3–5 years), cashed out during stock market booms.
- **Rising Outward FDI:** Indian companies are investing more abroad to tap into global markets and supply chains.
  - This reduces net FDI, as more capital flows out.
- **Global Headwinds:** Higher interest rates, wars, and global economic slowdown made investors cautious.
  - Resulted in reduced fresh investments into India.
- **Policy and Regulatory Uncertainty:** Complex rules, weak enforcement, and absence of strong investment treaties are discouraging investors.

Impacts

- **Illusion of Investment Strength:** Headline numbers (gross inflows) mask the **underlying weakness** of actual productive investment.
- **Low Contribution to Capital Formation:** Dominance of brownfield and financial FDI limits **technology transfer**, job creation, or industrial upgradation.
- **Economic Vulnerability:** High volatility due to **short-term, speculative** flows reduces economic stability.
- **Loss of Policy Credibility:** Disconnect between government claims and real data undermines **investor confidence** and policymaker credibility.
- **Missed Industrial Development:** India's manufacturing and tech sectors receive **less benefit**, further aggravating structural economic issues.

Way Forward

- **Shift Focus to Greenfield FDI:** Incentivize **long-term investments** in infrastructure, manufacturing, and R&D through targeted policy and ease of doing business.
- **Tighten Capital Flow Regulations: Regulate PE/VC flows** more carefully, especially those via tax havens; ensure alignment with national development goals.
- **Improve Investment Environment:** Enhance policy clarity, reduce bureaucratic hurdles, and strengthen contract enforcement to attract serious investors.
- **Transparent Reporting:** Disaggregate FDI data to distinguish between **productive** vs. **financial flows** for better policymaking.
- **Reform Tax Treaties and Curb Treaty Shopping:** Revise **Double Taxation Avoidance Agreements (DTAAs)** with tax havens to prevent round-tripping and misuse.
- **Strengthen Domestic Capabilities:** Promote **technology upgrading, skill development**, and innovation domestically to make India a destination for quality FDI.

Opportunity for India to integrate more with Global Supply Chains

Syllabus Mapping: GS Paper 3, Economic growth, External Sector

Context

If supply chains are rejigged during the second Trump presidency, India may have an opportunity to integrate more deeply with global value chains.

Why a Second Trump Presidency Matters

- **Tariff-Centric Policy:** Trump is likely to impose **broad-based tariffs**, including proposed **60%+ on Chinese goods**.
- **Disruption of China-centric Supply Chains:** High U.S. tariffs will make importing from China expensive, **pushing global firms to diversify sourcing**.

- **Incentive for 'China+1' Strategy:** Multinational corporations will seek **alternative manufacturing hubs** to reduce dependence on China.

How This Creates an Opportunity for India

- **Favorable Geopolitics:** Though Trump has announced tariffs against India as well, India is **targeted** by U.S. tariffs and is seen as a **friendly partner** in global trade. It is expected that the USA will sign a trade deal with India soon.
- **Large and Skilled Workforce:** India has a **cost advantage** (low wages) and a growing pool of **engineering and technical talent**.
- **Existing Government Schemes:** PLI (Production Linked Incentives), Make in India, and improved ease of doing business **position India as an attractive alternative**.

Sectors Likely to Benefit in India

- **Electronics Manufacturing:** Smartphones, semiconductors, display units (Apple, Foxconn already shifting).
- **Mid-tech Labour-Intensive Sectors:** Textiles, footwear, toys, furniture — sectors where **China's dominance could be challenged**.
- **Auto Components & EVs:** Wiring harnesses, battery modules — growing sectors where India can plug into value chains.

India's Strengths in Capturing the Shift

- **Low Labour Costs:** Manufacturing wages in India are among the **lowest in Asia**.
- **Existing Manufacturing Ecosystems:** For electronics (Tamil Nadu), textiles (Gujarat, Tamil Nadu), auto parts (Maharashtra, Haryana).
- **Improved Global Perception:** India is increasingly viewed as a **reliable, democratic partner**.
- **Large service exports capabilities:** USA is a largest market for India's service exports. Sectors like IT/ITES, BPO etc. in India have been working with multiple US firms. Also, increasingly many US based companies have started opening their own global capability centres in India to benefit from India's excellent human capital.

What India Must Fix to Fully Seize the Opportunity

- **Lower Import Tariffs:** Reverse recent protectionist hikes (e.g., increased import duties on certain goods like steel and edible oils) to make it easier to join **global supply/value chains**.
- **Trade Agreements:** Fast-track FTAs with **U.S., EU, UK**, and Indo-Pacific allies to **ease exports**.
- **Ease of Doing Business:** Streamline **land acquisition, labour laws, power supply, and customs clearance**.
- **Infrastructure Development:** Improve **port connectivity, freight corridors, and plug-and-play industrial zones**.
- **Workforce Skilling:** Align vocational training with **electronics, textiles, auto parts** industry needs.

Risks India Should Watch Out For

- **Competition from Vietnam, Indonesia, Mexico:** These countries already benefit from earlier shifts and are **better integrated** in Global Value Chains (GVCs).
- **Policy Uncertainty:** Frequent tariff changes and unclear regulations could **deter foreign investors**.
- **Infrastructure Bottlenecks:** Slow logistics and unreliable utilities may **hurt scalability**.

Conclusion

India has a **strategic window of opportunity** due to the potential reshaping of global trade under a second Trump presidency. To become a **preferred alternative to China**, India must act fast with **deep trade and domestic reforms**, especially in **mid-tech export sectors**. If executed well, this shift could significantly boost India's role in global value chains, driving growth, exports, and employment.

India's Energy Transformation

Syllabus Mapping: Infrastructure Issues

Context

India has become the world's fourth-largest economy, driven by reform-led growth. Central to this rise is a transformed energy sector, now a pillar of sovereignty, self-reliance, and sustainable development.

Why India Must Strengthen Its Energy Sector

- **Accelerating Demand:** Energy demand is projected to **rise 2.5x by 2047**, contributing **25% of global incremental demand**.
- **Strategic Sovereignty:** Energy security **equates to national development security**, especially in a geopolitically turbulent world.
- **Economic Growth Engine:** With GDP at $4.3 trillion, uninterrupted energy flow is vital for sustaining India's global economic momentum.
- **Self-Reliance & Resilience:** Reduced import dependency through domestic production and diversified sources enhances India's strategic autonomy.
- **Green Development Goals:** Biofuels, green hydrogen, and CBG (Compressed Biogas) integration support India's net-zero and energy transition commitments.
- **Consumer-Centric Model:** Subsidies, stable pricing, and wide LPG access prioritize affordability without compromising infrastructure upgrades.

Steps Taken by Government in Enhancing Energy Strategy

- **Exploration and Production Push:** Doubling of exploration acreage (8% to 16%) with the goal of covering 1 million sq. km by 2030.
  - Reform-driven expansion via Open Acreage Licensing Policy (OALP), reduced 'No-Go' areas by 99%.
  - Pricing incentives and infrastructure sharing under new revenue-sharing models.
- **Technology-Backed Discoveries:** Over 25 new hydrocarbon discoveries by ONGC and Oil India across multiple basins.
  - Use of seismic surveys, AGG, and Mission Anveshan to map frontier areas like the Andamans and Cauvery.
- **Downstream and Retail Expansion:** 24,000 km product pipelines, 96,000+ fuel retail outlets.
  - City gas coverage increased to 307 areas; PNG and CNG networks scaled up.
- **Green Energy Integration:** Ethanol blending reached 19.7% (2025); CBG under Sustainable Alternative Towards Affordable Transportation (SATAT) with over 100 plants; ₹1.26 lakh crore in forex savings.
  - Massive push for green hydrogen—8.62 lakh tonnes of tenders awarded, with major PSU-led projects underway.
- **Policy and Infrastructure Reforms:** Oilfields Act 2024 enables hybrid leases for hydrocarbon-renewable synergy.
  - PM Gati Shakti mapped over 1 lakh assets; aided projects like Indo-Nepal pipeline and Samruddhi Corridor.

Other Indian Energy Security Initiatives

Initiative	Objective	Current Status (2024-25)
PM Surya Ghar Muft Bijli Yojana	Launched 2024, subsidizes rooftop solar for 1 crore households, providing 300 free electricity units monthly, enhancing energy access and security.	Over 1 million installations; ongoing national rollout.
PM-KUSUM Scheme	Aims for 34,800 MW solar via decentralized solar for farmers: pumps, plants, grid-connected; boosts clean energy and farmer income.	4,233 MW installed by Dec 2024; implementation ongoing.
National Solar Mission (NSM)	Started 2010, targeted 100 GW solar capacity by 2022 under India's climate goals; supports solar parks, rooftop, and off-grid solutions.	Target met; ~110.8 GW installed by May 2025; expanding.
National Green Hydrogen Mission	Launched 2023, promotes green hydrogen production, export, and ecosystem; aims to make India a global hub for green hydrogen.	Pilot plants set up, policy frameworks developing.
CCDC Wind Initiative	Launched 2020 to centralize wind energy data, enable better site identification, and coordinate wind energy development nationwide.	800+ stations; 48 GW wind installed by Jan 2025.

Energy Transition Index 2025

Recently, **the Energy Transition Index (ETI)** was **released by the World Economic Forum.**

About Energy Transition Index (ETI)-2025

- **Purpose:** Assesses national energy systems and tracks progress in energy transition across 118 countries
- **Final Score:** Composite of two sub-indices:
  - **System Performance (60%)** – Measures equity, security, and sustainability
  - **Transition Readiness (40%)** – Includes:
    - **Core Enablers:** Regulation, political commitment, finance & investment
    - **Enabling Factors:** Innovation, infrastructure, education, and human capital
- **Top 5 Countries:** Sweden > Finland > Denmark > Norway > Switzerland

- **Other Major Rankings:**
  - **China:** 12th
  - **USA:** 17th
  - **Pakistan:** 101st
  - **Congo:** Ranked lowest
- **India's Performance:** 71st
- **Progress in:**
  - Expanding energy access
  - Reducing energy intensity
  - Lowering methane (CH_4) emissions
  - Improving energy regulations
  - Attracting clean energy investments

Reimagining a green movement of goods

Syllabus Mapping: GS Paper 3, Logistics sector

Context

India's logistics sector, expected to nearly double to **$428 billion by 2033**, plays a crucial role in powering economic growth and trade. However, it also contributes significantly to **greenhouse gas emissions** and **diesel consumption**. As India pushes towards its **Net Zero goals** and the vision of **Viksit Bharat 2047**, transitioning to **green and efficient logistics** is not just desirable—it is essential.

Environmental Concerns Related to Logistic Sector

- **Overdependence on Road Transport:** Roads carry over 60% of freight, causing higher emissions and road congestion. The sector accounts for **13.5% of India's GHG emissions**; trucks alone emit over **one-third of transport CO_2.**
- **Excessive Diesel Consumption:** Accounts for **nearly 40% of India's total diesel use**. Diesel combustion releases **particulate matter (PM), nitrogen oxides (NOx),** and **sulphur dioxide (SO_2)** — harmful air pollutants.
- **Urban Congestion and Noise Pollution:** Inefficient last-mile delivery and unregulated freight movement in cities cause traffic congestion, wasted fuel, and noise pollution.
- **Carbon-Intensive Infrastructure:** Logistics infrastructure like warehouses and cold chains often rely on non-renewable energy sources. Lack of energy-efficient designs leads to high carbon footprints.

Government Schemes to Boost the Logistics Sector

Scheme/Initiative	Objective
PM Gati Shakti National Master Plan (2021)	Integrated infrastructure development for seamless multi-modal logistics across 7 engines (rail, road, air, etc.).
National Logistics Policy (2022)	Reduce logistics cost from 13-14% of GDP to 8-10%; improve efficiency and sustainability.
Unified Logistics Interface Platform (ULIP)	Digital integration of various stakeholders to streamline documentation and real-time tracking.
Sagarmala Project	Port-led development to reduce logistic cost, transit time through coastal and inland waterways.
Bharatmala Pariyojana	Development of highways & economic corridors to improve road connectivity for freight movement.
Freight Smart Cities (MoRTH Initiative)	Promote city-level logistics planning for congestion-free, green, and efficient freight systems.
Dedicated Freight Corridors (DFCs)	Decongest railways by shifting goods transport from road to energy-efficient rail corridors.

Steps for greening of Logistics Sector

- **Promote Green Logistics Practices:** Incentivise adoption of **Electric Vehicles (EVs)** and **LNG trucks** for urban and intercity freight.
- **Expand Rail and Waterway Freight:** Strengthen **Dedicated Freight Corridors** and **inland water transport** to reduce road load.

- **Adopt Smart Planning Tools:** Use **AI and data analytics** to optimise routes, reduce fuel usage, and improve load efficiency.
- **Invest in Sustainable Infrastructure:** Develop **green warehouses** with solar energy, LED lighting, and rainwater harvesting systems.
- **Skilling and Formalisation:** Support MSMEs and transporters in adopting digital tools and eco-friendly practices.
- **Policy Support for Clean Energy Use:** Provide **subsidies or tax incentives** for using alternative fuels and EV charging infrastructure.
- **Strengthen Urban Freight Management:** Promote **Freight Smart Cities** with dedicated freight lanes, time-slotting, and low-emission zones.

Aviation Sector Concerns

Syllabus Mapping: GS-Paper 3, Infrastructure

Context

The recent **Air India Dreamliner crash (AI171)** in Ahmedabad, Gujarat has intensified scrutiny on the preparedness of the Aviation sector.

Current Growth Of Aviation Sector of India

- Domestic air travel is rebounding strongly with **6–10% annual growth**.
- India is now the **3rd-largest aviation market in the world**.
- **Delhi's Indira Gandhi International (IGI)** airport ranks among the **top 10 busiest airports worldwide** (around 79 million passengers) and 3rd busiest in Asia

Concerns and Issues of Aviation Sector

- **Aircraft Safety and Airworthiness:** Past issues with Dreamliner include **battery fires**, **engine icing**, and **manufacturing quality lapses**. Experts fear gaps in **aircraft maintenance**, **pre-flight checks**, and **crew training**.
- **Regulatory Oversight Gaps: Directorate General of Civil Aviation (DGCA)** faces staff shortages, limiting its ability to perform thorough safety audits.
  - There are delays in responding to complaints, ramp inspections, and safety incident analysis.
  - India's aviation regulator is **overstretched** given the rapid fleet expansion.
- **Shortage of Skilled Manpower: Pilot shortage** is acute, especially for widebody aircraft.
  - **Training facilities and simulators** are insufficient to meet demand.
  - Skilled **aircraft maintenance engineers (AMEs)** and **air traffic controllers (ATCOs)** are also in short supply.
- **Airport Infrastructure Challenges: Congestion at** major airports like Delhi, Mumbai, and Bengaluru causes delays and potential safety risks.
  - **Tier-2 and Tier-3 airports** lack essential infrastructure like fire safety, navigation aids, and bird hazard control.
  - **Airspace saturation** in busy corridors increases mid-air risk.
- **Supply Chain and Aircraft Availability:** Delays in aircraft and engine deliveries due to **global supply chain issues**.
  - **Spare parts shortages** increase aircraft-on-ground (AOG) time.
  - Airlines are forced to **cannibalize grounded jets** for parts.
- **Financial Fragility of Airlines:** Margins are thin due to **high fuel costs**, **leasing rates**, and **currency volatility**.
  - Many airlines are still recovering from **COVID-era debts**.
  - **High leasing costs** persist due to weak contract enforcement (Cape Town Convention not fully implemented).

Key Government Initiative

- **National Civil Aviation Policy (NCAP) – 2016 (MoCA):** Enhances domestic aviation growth by rationalizing MRO taxation, supporting international expansion, and creating a more investor-friendly aviation ecosystem.
- **NABH (NextGen Airports for Bharat) Nirman (MoCA):** Focuses on modernizing airport infrastructure and increasing capacity to accommodate the rising number of air passengers.
- **DigiYatra (MoCA):** Introduces biometric-based, paperless travel to streamline airport processes and improve the passenger experience.
- **GAGAN (GPS-Aided GEO Augmented Navigation) – ISRO + AAI:** Enhances flight navigation accuracy and efficiency, improving operational safety through satellite-based augmentation.
- **100% FDI in Aviation (DPIIT):** Permits full foreign ownership in greenfield airport projects and up to 49% in domestic airlines via the automatic approval route to attract global investment.
- **Krishi Udan Scheme (MoCA):** Supports air transportation of perishable agricultural products, aiming to boost farmers' income and reduce post-harvest losses.
- **Aircraft Leasing & Financing at GIFT City (IFSCA):** Establishes a domestic hub for aircraft leasing and financing to reduce reliance on foreign leasing companies.
- **Open Sky Policy (MoCA):** Liberalizes international airspace access, encouraging greater global connectivity and foreign airline participation.
- **Make in India – Aviation (DPIIT):** Encourages domestic manufacturing of aircraft parts, systems, and airport infrastructure to strengthen the aviation supply chain and reduce imports.
- **GST Introduced**: A uniform **5% Integrated Goods and Services Tax (IGST**) rate has been introduced for aircraft parts to promote India as a competitive global MRO hub.

Union Budget 2025–26: Key Initiatives to Strengthen India's Aviation Sector

- **Revamped UDAN Scheme**: The government has announced a modified UDAN initiative aimed at strengthening regional air connectivity.
  - The updated scheme will add 120 new destinations and is expected to serve an additional 4 crore passengers over the next 10 years.
- **Infrastructure Development**: Major plans include the expansion of Patna Airport and the development of a brownfield airport at Bihta in Bihar to enhance aviation infrastructure.
- **Focus on Remote Areas**: The UDAN scheme will also support the establishment of helipads and small airports in hilly regions, aspirational districts, and the Northeastern states, promoting access in underserved areas.
- **Budget Allocations**: The Ministry of Civil Aviation has been allotted ₹2,400.31 crore, a decrease from ₹2,658.68 crore in the previous year.
  - Funding for **UDAN scheme** has been **reduced to ₹540 crore from ₹800 crore**.

Regional Connectivity Scheme - Ude Desh ka Aam Naagrik (RCS-UDAN)

- **Launched:** 2016
- **Ministry:** Ministry of Civil Aviation
- **Objective**: To connect small and medium cities with big cities through air service.
- **Funding**: **Jointly funded** by the central government and state governments.
- **Features**: Linking **small and medium towns** to **major cities** through air connectivity.
  - Ensuring air travel is **affordable, economically sustainable, and commercially viable**.
  - Offering **financial incentives** to select airlines to promote services from **unserved and underserved airports**.

Two components of UDAN:

- **Airports:** The first component is to develop new airports and enhance the existing regional airports to increase the number of operational airports for scheduled civilian flights.
- **Flight routes:** The second component is to add several hundreds of new financially-viable, capped-airfare, new regional flight routes to connect more than 100 under-served and unserved airports in smaller towns by using "Viability Gap Funding" (VGF) where needed.

Significance of UDAN Scheme

- **Enhanced Regional Connectivity**: The scheme promotes **balanced regional development** by connecting smaller cities and remote areas with major urban hubs through air routes.
  - It boosts **intra-state and inter-state connectivity**, particularly in the North-Eastern states, hill states, and islands.

- **Affordable Air Travel**: UDAN caps airfare at **₹2,500 for a one-hour flight**, making flying more accessible to the common man.
  - This democratizes air travel, encouraging **middle-class and lower-middle-class** participation.
- **Infrastructure Development**: Development of **airports in tier-2 and tier-3 cities** fosters local infrastructure growth.
  - Reviving unused or underused airstrips helps in **optimizing national assets**.
- **Economic and Tourism Boost**: Enhanced connectivity promotes **tourism**, trade, and **employment generation**.
  - It leads to the **development of regional economies** and supports the **Make in India** and **Startup India** missions.
- **Environmental and Social Benefits**:
  - Better air connectivity reduces **road traffic congestion** and can **lower fuel usage** for long journeys.
  - Improves **medical evacuation** and emergency services access in remote areas.

Way Forward

- **Infrastructure Modernization & Expansion:** Accelerate the 200-airport target by 2025 and 4,000-aircraft fleet plan through $11 billion in infrastructure investments.
  - **Prioritize greenfield airports in underserved regions** and **upgrade existing hubs** (e.g., Delhi, Mumbai) to handle rising traffic, which is projected to double by 2029.
- **Legislative & Policy Reforms**: Implement the Protection of Interest in Aircraft Objects Bill, 2025 to align leasing laws with global standards.
- **MRO Ecosystem Development:** Establish MRO clusters near major airports and streamline customs for faster spare-part clearances.
- **Workforce & Safety Enhancements:** Address 12–15% crew shortages through accelerated training programs and partnerships with global institutes.
  - Mandate AI-driven safety protocols and fatigue management systems to reduce incidents like unstable approaches and runway overruns.
- **Technological Integration & Global Collaboration:** Adopt AI/ML for predictive maintenance and digital twin systems to optimize operations.
  - Partner with firms like Airbus for "Make in India" aviation manufacturing, starting with the TATA-Airbus C-295 facility in Vadodara.
  - Expand UDAN 5.0 to enhance last-mile connectivity through electric/hybrid aircraft pilots.

Issues in Inflation Estimation

Syllabus Mapping: GS Paper 3, Indian Economy

Context

In May 2025, India's inflation rate dropped, however, this decline was accompanied by a rise in unemployment and a slowdown in economic growth, exposing deeper challenges in India's economic landscape.

Data

- **Inflation:** In May 2025, India's inflation rate stood at **2.8%**, down from **3.2% in April**—well below the government's target.
- **Unemployment:** The **unemployment rate rose** from **5.1% in April to 5.8% in May 2025** (Periodic Labour Force Survey).
  - While falling inflation benefits those already employed (their purchasing power erodes more slowly), it offers no solace to the unemployed.
- **GDP Growth: GDP growth dropped** from **9.2% in 2023-24** to **6.5% in 2024-25**.

Key Drivers for Reduction in Inflation

The principal reason for reduction in the overall inflation in the Indian economy is sharp reduction in food prices. Food inflation fell from 11% in October 2024 to less than 1% in May 2025. It has to be noted that Food has the largest weightage in the CPI with 45.86% weight, meaning food prices have a significant impact on inflation numbers in the Indian economy. This was due to:

- **Sharp Increase in Agricultural Growth:** Agriculture was the only sector to accelerate significantly in 2024-25, boosting food supply.
- **Normal monsoon** facilitated large scale cultivation and production of food grains.
- **Narrowing Supply-Demand Gap for Food.**
- **Low global demand for consumption and investment** to plateauing of economic growth and policy uncertainties.
- **Reducing interest rates:** Across the world central banks have started reducing interest rates. RBI has reduced the policy repo rates in recent months, in June RBI cut the repo rates by 0.5%.

Challenges on inflation front

- **Commodity price pressures on account of conflict in the Middle East:** Iran has threatened to block the Gulf of Hormuz which can trigger an oil shock. India depends on imports for meeting 8%% of its crude oil.
- **Trade wars:** Ongoing trade wars and particularly hoarding of commodities such as rare earth magnets may lead to supply disruptions and trigger price hikes.
  - Note, China has imposed export restrictions on rare earth magnets adversely affecting many industries, principally automobile.

Issues in Inflation Estimation

- **Overemphasis on Monetary Policy:** There is a common tendency to credit the Reserve Bank of India's monetary policy—especially interest rate adjustments—as the main reason for changes in inflation.
  - This view often **overlooks the crucial role of supply-side factors**, such as agricultural output, which have a more direct impact on food prices and overall inflation in India.
- **Neglect of Unemployment and Growth:** While the decline in inflation is celebrated, **important indicators like unemployment and GDP growth are ignored**.
  - **E.g.,** during the period when inflation fell from 3.2% (April 2025) to 2.8% (May 2025), **unemployment actually rose from 5.1% to 5.8%**, and GDP growth slowed significantly from 9.2% (2023-24) to 6.5% (2024-25).
- **Misinterpretation of Inflation Expectations:** Policymakers often rely on the idea that inflation targeting will anchor public expectations.
  - However, **household inflation expectations have remained persistently high**, well above the RBI's target, showing that inflation targeting has **not effectively influenced public sentiment**.
- **Ignoring Structural Drivers:** Mainstream inflation analysis frequently **underestimates the impact of structural factors** such as the relative growth rates of agricultural and non-agricultural sectors.
  - The recent sharp fall in food inflation was driven more by improved agricultural output than by changes in monetary policy, **highlighting the need to factor in sectoral growth dynamics**.

What Needs to Be Done

- **Adopt a Broader Policy Perspective:** Focus equally on growth, employment, and inflation, not just price stability.
- **Strengthen Agricultural Productivity:** Invest in agriculture to sustain food supply and control food inflation.
- **Address Unemployment:** Implement targeted job creation and skills development programs alongside macroeconomic management.
- **Enhance Data-Driven Policymaking:** Use comprehensive data analysis (including sectoral growth and supply-side factors) for effective economic decision-making.
- **Communicate Realistic Policy Goals:** Ensure public understanding that inflation management requires balancing both demand- and supply-side interventions.

TOPICS FOR MAINS (AGRICULTURE)

Empowering Women in Agriculture for Food Security

Syllabus Mapping: GS Paper 3, Agriculture

Context

The United Nations General Assembly has declared **2026 as the International Year of the Woman Farmer.** The resolution celebrates the essential role of women in global agriculture while raising awareness of their challenges, which include property rights and market access.

Significance of Women in Agriculture

- **Substantial Contribution to Food Production:** Women account for **60% to 80% of food production** in developing countries and nearly **39% of agricultural labour** in South Asia.
- **Vital Role in Household Food Security:** Women farmers directly contribute to family nutrition, food availability, and community food security through local and subsistence agriculture.
- **Contribution to Rural Economy:** Women's involvement boosts local economies by ensuring steady agricultural production, contributing significantly to rural economic resilience.

- **Custodians of Biodiversity and Traditional Knowledge:** Often maintain traditional agricultural practices, preserving indigenous seeds, biodiversity, and promoting climate-resilient farming techniques.
- **Critical Role in Climate Adaptation:** Women actively adapt farming practices to environmental changes, significantly contributing to resilience at community levels.

Challenges Faced by Women Farmers

- **Identification Challenges:** Difficulty in accurately identifying and supporting women farmers, especially those who work as tenant farmers or agricultural labourers.
- **Land Ownership and Property Rights:** Women in India represent only about **8.3%** of landowners, significantly limiting their control over resources and their ability to secure credit and institutional support.
- **Limited Access to Finance:** Due to **lack of property collateral,** women farmers struggle to obtain substantial loans, constraining their ability to invest in farming technology and infrastructure.
- **Restricted Access to Technology and Information:** Lower access to mobile phones, internet, and agricultural advisories hampers women's capability to adopt advanced farming practices and climate-adaptive techniques.
- **Increased Vulnerability to Climate Change:** Climate change disproportionately affects women farmers, escalating their **household and agricultural responsibilities,** and intensifying their exposure to agricultural and livelihood risks.
- **Inadequate Representation and Participation: Limited decision-making power and inadequate representation in agricultural policy** formation impede their ability to advocate effectively for their needs.

Way Forward

- **Improve Farmer Identification:** Use advanced data triangulation to accurately identify **women farmers.** This is the first step to ensure that government policies and welfare measures reach them.
- **Ensuring Gender-Equitable Land Rights:** Policies must actively promote property ownership among women, facilitating land registration and inheritance rights to empower their economic position.
- **Enhancing Financial Access and Inclusion:** Expand access to credit and financial services tailored specifically for women, leveraging self-help groups, cooperatives, and microfinance models.
- **Scaling Up Access to Agricultural Technology:** Enhance digital literacy and technology access through targeted interventions, like **Climate Adaptation Information Centres and mobile advisories**, to enable women farmers to make informed decisions.
- **Strengthening Agricultural Value Chains:** Support **women-led agricultural cooperatives, value chains, and enterprises**, ensuring market linkages, fair prices, and sustainable agricultural practices.
- **Inclusive Policy Design and Implementation:** Implement **gender-sensitive agricultural policies based on granular, gender-disaggregated data,** ensuring the unique needs of women farmers are recognized and addressed effectively.
- **Capacity Building and Empowerment Initiatives:** Continuously enhance skills and knowledge of women farmers through government schemes like **Mahila Kisan Sashaktikaran Pariyojana**, promoting skill upgrades and sustainable farming practices.
- **Encourage Community-Based Climate Adaptation:** Expand successful **models like ENACT (Enhancing Climate Adaptation of Vulnerable Communities),** which leverage women's active participation in adopting climate-resilient practices, diversification, and community seed production.

Mustard Oil, GM Crops, and Public Health

Syllabus Mapping: GS Paper 3, Agriculture, Oilseeds

Context

Two recent decisions — FSSAI's 2021 ban on blended mustard oil and the Supreme Court's 2024 ruling against GM mustard — aim to protect public health, but raise complex trade-offs.

Mustard oil (rapeseed-mustard oil) is the 3rd-largest edible oil consumed in India. It is a dietary staple, especially in northern and eastern regions.

Issues in Mustard Oil Policy

- **High Erucic Acid Content in Mustard Oil:** Indian mustard oil contains 40–54% erucic acid vs. global norm of <5%.
  - High levels are linked to cardiac and organ-related issues in lab animals.
  - Globally, low-erucic alternatives like canola are preferred.
- **FSSAI Ban on Blended Mustard Oil (2021):** Aimed at reducing adulteration and boosting mustard farming.

- However, blending reduces erucic acid and improves lipid profile (↑ HDL, ↓ LDL). The ban affects consumer health options and affordability.

HDL (High-Density Lipoprotein) – "Good" Cholesterol

- HDL is known as the "good" cholesterol.
- Its main function is to absorb cholesterol from the blood and carry it back to the liver, where it can be broken down and removed from the body.
- Higher levels of HDL are associated with a lower risk of heart disease and stroke because HDL helps clear excess cholesterol from the arteries, preventing plaque buildup.
- HDL also has anti-inflammatory and antioxidant properties, further protecting blood vessels.

LDL (Low-Density Lipoprotein) – "Bad" Cholesterol

- LDL is referred to as the "bad" cholesterol.
- It transports cholesterol from the liver to the cells, but when present in excess, LDL can deposit cholesterol on artery walls, leading to the formation of plaque.
- This buildup narrows and hardens arteries (atherosclerosis), increasing the risk of heart attack, stroke, and other cardiovascular diseases.
- High levels of LDL are a major risk factor for coronary artery disease.

- **Supreme Court Ruling Against GM Mustard (2024):** GM crop DMH-11 has lower erucic acid (30–35%) and higher yield.
  - SC cited insufficient health impact assessments.
  - Denial may prolong reliance on high-erucic, traditional mustard.
- **Public Health vs. Food Safety:** Adulteration concerns are valid — FSSAI found 24% oils failed quality checks.
  - But a blanket ban reduces healthier blending options instead of improving regulation.
- **Economic Angle:** India imports $20.56 billion worth of edible oils annually.
  - GM mustard could reduce this by enabling domestic production of low-erucic oil.
  - Current policy may perpetuate high import dependency.

Policy Gaps and Recommendations

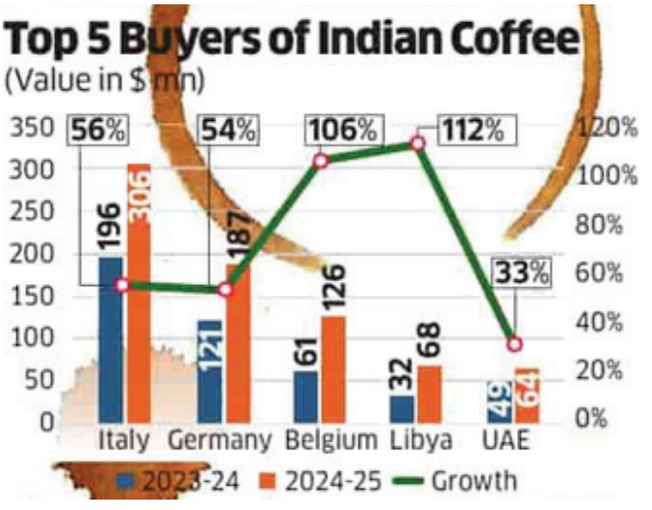
- Both the FSSAI ban and the Supreme Court's cautious approach to GM mustard were motivated by public health concerns.
- However, neither policy fully addresses the core problem: the high erucic acid content of Indian mustard oil.
- **International Context:** Canada and Europe have developed rapeseed cultivars with <2% erucic acid through breeding programs.
  - India's plant breeding efforts should prioritize achieving similar low-erucic acid traits.
- **Effective solutions require:** Promoting low-erucic acid mustard varieties (through GM or conventional breeding).
- Allowing safe, regulated blending with clear labeling and strong enforcement to prevent adulteration.
- Prioritizing research and development to bring Indian mustard oil in line with international health standards.

India's Robusta Beans Export

Syllabus Mapping: GS Paper 3, Agriculture, Plantation crops

Context

The country's coffee exports have **increased by about 125%** to $1.8 billion over the last 11 years, according to government data.



Journey of Coffee Plantation in India

- **Origin (17th Century):** Introduced around 1670 by **Baba Budan**, who smuggled seven coffee seeds from Yemen and planted them in the hills of **Chikmagalur, Karnataka**.
- **British Expansion (19th Century):** British planters systematically expanded coffee cultivation in Karnataka (especially Kodagu and Chikmagalur), Tamil Nadu (Nilgiris), and Kerala (Wayanad).
- **Post-Independence Scenario (1950s-1980s):** Coffee plantations gradually expanded to other southern states, stabilizing India as a key global exporter.

- **Crisis and Transition (1990s)**: Severe **white stem borer** infestations destroyed high-quality **Arabica** coffee plantations, especially in Karnataka.
  - Farmers transitioned from **Arabica** (high-quality, sensitive, premium-priced) to **Robusta** (hardy, lower-priced).
- **Recent Boom (Post-2020)**: Robusta coffee prices surged globally, driven by global shortages, positioning Indian coffee (especially from Kodagu) favourably in international markets.
  - Exports reached record levels ($1.2 billion in FY2024-25), despite modest volume growth.

Major Regions of Coffee Plantation in India

- **Karnataka** (Largest producer ~70% of India's coffee):
  - **Kodagu (Coorg)**: Robusta-dominated, largest contributor.
  - **Chikmagalur**: Traditionally Arabica-dominant but increasingly shifting to Robusta.
  - **Hassan**: Mixed Arabica and Robusta.
- **Kerala**: **Wayanad** (Predominantly Robusta).
- **Tamil Nadu**: **Nilgiris, Yercaud, Shevaroys, Palani Hills** (Mostly Arabica).
- **Andhra Pradesh**: **Araku Valley**→→ High-quality, exclusively Arabica.
- **Northeast India**: Parts of Assam, Meghalaya, Mizoram, Tripura, Nagaland.

Requirements for Coffee Plantation

- **Climate**:
  - Moderate rainfall (150–250 cm/year).
  - Cool to moderate temperatures (15–28°C).
  - Frost-free environment.
  - High humidity and misty conditions are ideal.
- **Altitude**:
  - **Arabica**: Higher altitudes (600–2200 meters above sea level).
  - **Robusta**: Lower elevations (300–800 meters above sea level).
- **Soil**: Rich, well-drained loamy soils with organic matter.
  - Slightly acidic (pH around 6.0 to 6.5).
- **Shade & Canopy**: Indian coffee predominantly grown under shade (shade-grown), creating natural habitat that preserves biodiversity and moisture.
  - Trees such as Jackfruit, Silver Oak, Teak, and Pepper vines are common shade-providers.
- **Labour Intensive**:
  - Primarily hand-picked, ensuring higher quality.
  - Labour cost is a significant portion (~60%) of production expenses.

Recent Trends and Challenges

- **Shifts in Coffee Varieties**: Once 70% Arabica and 30% Robusta, the ratio has reversed. Now India exports premium-quality Robusta globally.
- **Labour Shortage**: High wages, welfare schemes, and urban migration causing persistent labour shortages.
- **Environmental Concerns & Sustainability**: Elephant-human conflicts due to plantation encroachment on elephant corridors.
  - Indian coffee cultivation's shade-grown method positions India advantageously under new EU deforestation regulations (EUDR, effective Dec 2025).
- **Market Volatility**: Recent price fluctuations due to changing global supplies.
  - Increasing formation of farmer-producer companies to leverage better pricing power.

Coffee Board of India

- **Established**: 1942 under the Coffee Act of 1942.
- **Headquarters**: Bengaluru, Karnataka.
- **Ministry**: Ministry of Commerce and Industry, Government of India.
- **Primary Functions**:
  - **Promotion of coffee production** through research and development.

  - **Quality assurance and grading**.
  - **Market promotion** of Indian coffee globally.
  - **Export facilitation**.
  - **Supporting growers** through training, guidance, and subsidies.
  - **Providing market intelligence and price information**.
- **Recent Initiatives**:
  - Encouraging sustainability practices.
  - Assisting farmers in transitioning to profitable Robusta.
  - Promoting value-added coffees like organic, specialty, and eco-friendly produce.

Conclusion

India's coffee industry has traversed multiple phases—from the initial high-value Arabica dominance, through pest-driven challenges, to successfully leveraging robusta's global demand surge. Strategic interventions by the Coffee Board, sustainability initiatives, and adaptability to global market changes hold promise, though labour availability remains a critical issue moving forward.

TOPICS FOR PRELIMS (ECONOMY)

Anti Dumping Duty

Context

India imposed a **30% Anti-Dumping Duty (ADD)** on **bare printed circuit boards (BPCBs)** to protect domestic PCB manufacturers.

About Anti Dumping Duty

- **Definition:** An **Anti-Dumping Duty (ADD)** is a protectionist tariff imposed by a country on imported goods that are priced below fair market value.
- **Purpose**: ADD is imposed to protect local businesses from unfair competition by adjusting prices to fair trade levels and rectifying trade distortions caused by dumping.
- **WTO Permitted**: Anti-dumping measures are allowed under WTO regulations to ensure fair competition.
- **Impact**: While they protect local businesses, ADDs can result in higher prices for domestic consumers and may reduce international competition for domestic producers.
- **Administration in India:** Managed by the **Directorate General of Trade Remedies (DGTR)** under the Ministry of Commerce and Industry.
  - The **Department of Commerce** recommends the duty, and the **Ministry of Finance** levies it.

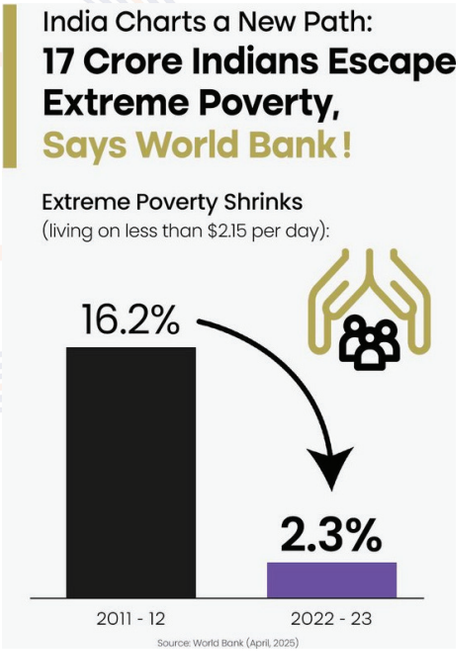
India's Extreme Poverty Fell Sharply: World Bank

Context

- According to the World Bank, 17 crore Indians were lifted out of poverty between 2011-12 and 2022-23.
  - Extreme poverty fell sharply from 16.2% to just 2.3%.

Key Points

- **Numerical Decline:** Extreme poverty in India fell from 344.47 million in 2011-12 to 75.24 million in 2022-23.
- **State Contributions:**
  - **Major Contributors (2011-12):** Uttar Pradesh, Maharashtra, Bihar, West Bengal, and Madhya Pradesh together accounted for **65% of India's extreme poor**.
  - These five states contributed to **two-thirds of the total reduction** in extreme poverty from 2011-12 to 2022-23.



- **Poverty Line Metrics:** Using the earlier $2.15 per-day poverty line (based on 2017 prices), India's poverty rate fell from 16.2% in 2011 to 2.3% in 2022, translating to a reduction from 205.93 million to 33.66 million individuals.
- **Rural vs. Urban Reduction:** Rural poverty decreased from 18.4% to 2.8%, while urban poverty declined from 10.7% to 1.1% between 2011-12 and 2022-23.
- **Multidimensional Poverty Index (MPI):** The MPI, which considers factors like health, education, and standard of living, dropped from 53.8% in 2005-06 to 15.5% in 2022-23.

- **Multi-dimensional Poverty Index:** Uses a range of indicators (monetary, health, education and others) to calculate a summary poverty figure for a given population.

Government Initiatives

- **Pradhan Mantri Awas Yojana:** Provided affordable housing to poor households, improving living standards.
- **Pradhan Mantri Ujjwala Yojana:** Ensured access to clean cooking fuel (LPG) for rural and economically weaker sections.
- **Jan Dhan Yojana:** Expanded financial inclusion by opening bank accounts for millions of unbanked individuals.
- **Ayushman Bharat:** Offers free health insurance to low-income families, reducing out-of-pocket medical expenses.

Small Finance Banks

Context

Jana Small Finance Bank Ltd has submitted an application to the Reserve Bank of India (RBI) seeking approval for a voluntary transition from a small finance bank to a universal bank.

About Small Finance Banks

- **Key Objectives:**
  - **Financial Inclusion:** Extend banking services to rural and semi-urban areas.
  - **Microfinance Expansion:** Provide affordable credit and banking services to lower-income groups.
  - **Credit Accessibility:** Enhance credit availability for small enterprises, marginal farmers, and micro-entrepreneurs.
- **Regulatory Framework:**
  - Established based on recommendations of the **Nachiket Mor Committee (2014)**.
  - Licensed and regulated by the **Reserve Bank of India (RBI)** under differentiated banking licenses.
- **Eligibility and Operational Criteria:**
  - Minimum paid-up equity capital: ₹**200 crore**.
  - Must allocate **75% of Adjusted Net Bank Credit (ANBC)** to priority sector lending.
  - **At least 50% of the loan portfolio** must be loans and advances up to ₹25 lakh.
  - Mandatory to open at least **25% of branches in unbanked rural areas**.
- **Permitted Activities:**
  - Accept deposits (savings, current, fixed deposits).
  - Provide small-ticket loans, primarily microfinance and MSME loans.
  - Issue debit and ATM cards.
  - Distribution of financial products (insurance, mutual funds, pension) after RBI approval.
- **Prohibited Activities:**
  - Cannot engage directly in **large-scale corporate lending**.
  - Not permitted to set up **subsidiaries for non-banking financial services**.
  - **No foreign operations** are allowed.

Facts

- RBI allowed SFBs to apply for **Authorized Dealer (Category-II)** licenses for forex transactions in a limited scope (2023).
- After a period of successful operation, SFBs achieved the status of 'scheduled banks' under **Section 42 of the RBI Act, 1934**.
- In India, as of now **no Small Finance Bank has completed full conversion** to a universal bank.

Comparison of Small Finance Banks (SFBs) and Universal Banks

Aspect	Small Finance Banks (SFBs)	Universal Banks
Scope of Activities	Primarily cater to underserved segments like small businesses, farmers, MSMEs.	Offer a wide range of services to all customer segments, including corporate and retail banking, investments, forex, etc.
Minimum Capital Requirement	₹200 crore	₹500 crore
Credit Requirements	Minimum 75% of Adjusted Net Bank Credit to priority sectors	40% of Net Bank Credit to priority sectors
Focus Segment	Unbanked, semi-urban, rural, micro-enterprises	All customer segments (retail, corporate, etc.)
Branch Expansion	Mandatory 25% of branches in rural/unbanked areas	No mandatory specific ratio, but have rural presence norms
Foreign Operations	Not permitted	Allowed
Regulatory Framework	Regulated under RBI's differentiated banking norms	Regulated under RBI's universal banking norms
Deposits and Lending	Accept deposits; focus on small-ticket lending	Accept deposits; diverse lending and financial services
Investment Activities	Limited involvement	Wide-ranging investment banking and market operations

Relaxation of Special Economic Zones rules

Context

To support India's semiconductor ambitions, the Ministry of Commerce and Industry **amended the SEZ Rules, 2006.**

What Were the Changes?

- **Rule 5**: Reduction in Minimum Land Area For Semiconductor/ Electronic SEZs → **50 hectares** to **10 hectares.**
- **Rule 7: Relaxation of Encumbrance-Free Land Requirement**
- **Rule 18: Permission for Domestic Sales** → Sell only for export to the domestic **market** after paying applicable duties.

What are Special Economic Zones (SEZs)?

- SEZs are specifically delineated, duty-free enclaves treated as foreign territory for trade and customs purposes, set up to boost exports, attract investment, and create jobs.
- SEZs are created in India under the Special Economic Zones Act, 2005.
- Regulated by the Ministry of Commerce and Industry.
- **Key Features:**
  - Exemption from customs duty, GST, and other taxes
  - 100% FDI allowed in manufacturing
  - Single-window clearance and liberal regulatory regime
  - Units must export a minimum portion of production

Currently, India has 276 operational SEZs with total employment and 3.19 million people (March 2024). Goods exports from Indian SEZs reached US$ 143.34 billion till January, 2025.

History of SEZs in India

Year	Development
1965	First Export Processing Zone (EPZ) set up in Kandla, Gujarat — Asia's first.
2000	SEZ Policy announced as part of EXIM Policy to enhance EPZ framework.
2005	**SEZ Act, 2005** enacted to provide a legal framework and incentives. Came into effect in 2006.
2018	Baba Kalyani Committee recommended reforms to make SEZs more WTO-compliant and employment-friendly.
2022	Budget proposed replacing the SEZ Act with a new **Development of Enterprise and Service Hubs (DESH)** framework to align with WTO norms.

According to the Semiconductor Industry Association, **China accounted for about 35% of all semiconductors** manufactured in the world in 2021.

TOPICS FOR PRELIMS (AGRICULTURE)

Asafoetida (Heeng)

Context

CSIR-IHBT has reported the **first successful flowering and seed setting of asafoetida (heeng) at Palampur, Himachal Pradesh**, marking a significant milestone in its acclimatisation and domestication on Indian soil.

What is Asafoetida?

- **Botanical Name: Ferula assa-foetida**, a perennial herb.
- **Common Name:** Heeng in India.
- **Source:** Derived from the **oleo-gum resin** of the plant's taproot.
- **Usage:** Widely used as a **spice and medicinal agent** in Indian cuisine and Ayurveda.
- **Ancient Mentions:** Found in **Charaka Samhita**, **Mahabharata**, and **Panini's texts**.

Cultivation Zones

- **Native Habitat:** Cold arid regions of **Iran, Afghanistan, and Central Asia**.
- **Ideal Conditions:**
  - Sandy, well-drained soil.
  - Low rainfall (<300 mm).
  - Temperature range: –4°C to 40°C.
- **Potential Indian Zones:**
  - **Lahaul-Spiti**, **Kinnaur**, **Uttarkashi**, and similar high-altitude valleys.

Key Features of Asafoetida

- **Long Maturation:** Requires **5 years** to mature before flowering and resin extraction.
- **Resin Yield:** Oleoresin forms **40–64%** of the dried gum extracted from its roots.
- **Drought Tolerant:** Survives harsh winters and minimal water; remains dormant in extreme cold.
- **Medicinal Uses:** Treats **digestive issues**, **bloating**, **abdominal pain**, and helps stimulate metabolism.
- **Cultural Role:** Used in **rituals**, **cooking**, and **traditional medicine**.

Significance of Indigenous Cultivation

- **Self-Reliance Goal:** India was **100% import-dependent**, but now moves towards **domestic production**.
- **Breakthrough in Adaptation:** Successful **flowering and seed set** at **Palampur, Himachal Pradesh** (1300 m altitude), showing adaptability beyond cold desert zones.
- **National Importance:**
  - **Heeng Germplasm Resource Centre** established in 2022.
  - Development of **tissue culture labs** to scale up cultivation efforts.

CROPIC Initiative

Context

The Ministry of Agriculture and Farmers Welfare is set to launch **CROPIC**, an initiative to collect crop data through field photos and analyze it using **AI-based models**.

About CROPIC Initiative

- **CROPIC** stands for **Collection of Real-Time Observations & Photo of Crops**.
- Launched under **Pradhan Mantri Fasal Bima Yojana (PMFBY)**.
- Financed through the **Fund for Innovation and Technology (FIAT)** under PMFBY.
- Aim: To monitor **crop health and stress** and **automate crop loss assessment** using **AI and computer vision**.
- To be implemented in **at least 50 districts per season**, across diverse **agro-climatic zones**.
- Will focus on **three major notified crops** (covered under insurance) in each district.
- **How will it work?**
  - **Photos captured 4–5 times** during a crop's life cycle to assess health and detect mid-season losses. Uses **computer vision and photo-analytic models** to analyze images.
  - Photos will be **crowd-sourced directly from farmers** via the **CROPIC mobile app**, developed by the Ministry of Agriculture.
  - A **cloud-based AI platform** will analyze images to extract data like:
    - **Crop type**
    - **Growth stage**
    - **Damage and its extent**
- Initial rollout for **Kharif 2025** and **Rabi 2025–26** seasons.
- To be used during **insurance claim verification** under PMFBY.

SOCIETY AND SOCIAL JUSTICE

TOPICS FOR MAINS

Child Labour

Syllabus Mapping: GS-Paper 2, Social Justice, Vulnerable Sections

Context

Every year, **June 12** is observed as **World Day Against Child Labour** under the aegis of the **International Labour Organization (ILO)** to raise awareness about problem of child labour.

Status of Child Labour in India

- As per **Census 2011**, **43.53 lakh** (4.35 million) children in the **5–14 age group** were involved in child labour.
- India's child labour is concentrated in: **Beedi-making** (tobacco), **Carpet weaving**, **Firework industries** (Tamil Nadu), **Agriculture and domestic work** in both rural and urban areas.
- **Child Labour Rescues in India (April 2024–March 2025):** Total rescues: 53,651 children across 24 states/UTs.
- **Trends in Exploitation: 90%** of rescued children (mainly aged **10–14**) were in the **worst forms of child labour**.
- The **COVID-19 pandemic** reversed some progress, as many children dropped out of school due to economic pressure and did not return.

Challenges Associated with Child Labour in India

- **Poverty:** Families see child labour as an economic necessity.
  - **Eg:** Agricultural labour in UP & Bihar, stone factories in Rajasthan, etc.
- **Lack of Access to Quality Education:** Inadequate infrastructure and high dropout rates. Many children, especially girls, do not complete schooling.
- **Weak Enforcement of Laws:** Despite legal frameworks like the **Child Labour (Prohibition and Regulation) Act, 1986**, enforcement is often lax.
  - **Eg:** Firecracker units in Sivakasi (Tamil Nadu) continue to employ minors despite repeated scrutiny.
- **Hidden Labour:** Many child labourers are "invisible" as they work in homes, fields or family-run businesses.
- **Cultural Acceptance and Social Norms:** Child labour is normalized in some communities where children are expected to support the family from a young age.
- **Intergenerational Debt and Bonded Labour:** Many children are forced to work to repay family debts. This is visible in **brick kilns and quarries.**

Government Efforts To Eradicate Child Labour

Constitutional Provisions

Global Target for Eradication of Child Labour

- The Sustainable Development Goal (SDG) **Target 8.7** aims to **end child labour in all its forms by 2025.**

Legislative Measures

- **Child Labour (Prohibition and Regulation) Act, 1986 (Amended in 2016)**
  - Prohibits employment of **children below 14 years** in **all occupations**.

  - Prohibits **adolescents (14–18 years)** from working in **hazardous occupations/processes**.
  - Introduced stricter punishment: Employers: ₹20,000–₹50,000 fine and/or imprisonment up to 2 years.
  - **Parents**: Exempt from punishment unless they **repeatedly** force child labour.
- **Right of Children to Free and Compulsory Education Act, 2009**
  - Guarantees **free and compulsory education** to every child aged **6 to 14 years**.
  - Encourages **school enrolment** and **reduces dropout** that leads to child labour.
- **Juvenile Justice (Care and Protection of Children) Act, 2015**
  - Treats child labour as a form of **abuse and neglect**.
  - Allows stricter **legal action** against violators under child protection mechanisms.
- **National Commission for Protection of Child Rights (NCPCR):**
  - NCPCR is a statutory body established in 2007 under the Commission for Protection of Child Rights Act, 2005.
  - It works to ensure that all laws, policies and programs are in accordance with the child rights enshrined in the Constitution.
  - The Commission focuses on children up to 18 years of age.

Schemes and Programs

- **National Child Labour Project (NCLP) Scheme**
  - Launched in **1988**.
  - Provides **non-formal education**, **vocational training**, **stipends**, **nutrition**, and **healthcare** to rescued child labourers.
  - Operates **rehabilitation centres** in child-labour prone districts.
- **Samagra Shiksha Abhiyan:** Focus on **inclusive education** for out-of-school and working children.
- **Mid-Day Meal Scheme:** Incentivizes school attendance by providing **free cooked meals** to children.
  - Reduces the **economic burden** on poor families.
- **Skill India**: Trains youth (14–18 yrs) for formal sector jobs, reducing unsafe work.

Awareness Campaigns

- **"PENCIL Portal" (launched 2017)**: Platform for **Effective Enforcement for No Child Labour**.
  - Integrates data, complaint management, and rescue operations.
- **Childline 1098**: A 24×7 helpline to report child labour or abuse cases.
- **Social Media Campaigns & School Drives**: Regular campaigns during **World Day Against Child Labour (June 12)** and **Child Rights Week**.

Way Forward

- **Strengthen Enforcement:** Stricter implementation of laws like the **CLPRA (Amendment Act), 2016** which bans child labour under 14.
- **Universal Access to Quality Education:** Ensure effective implementation of **Right to Education (RTE) Act, 2009** with focus on retention.
- **Social Protection for Vulnerable Families:** Expand coverage of welfare schemes like **PM-KISAN**, **MGNREGA**, and **mid-day meals** to reduce reliance on child income.
- **Awareness Campaigns:** Change societal attitudes towards child labour through mass campaigns involving media, schools, and communities.
- **Skill Development and Adolescent Support:** For children aged 14–18, provide **vocational training** and **safe work alternatives**.
- **Community Mobilization:** Local ownership and monitoring, as seen in the **Velpur Model**, should be encouraged across India.
- Expand the list of **hazardous occupations** under law.

Velpur Model – A Community-led Success Story

- **Location**: Velpur Mandal, Nizamabad District, Telangana (then Andhra Pradesh)

Key Features:

- In **2001**, a 100-day community-driven campaign was launched to send all children (5–15 years) to school and eliminate child labour.
- **Initial Resistance:** Misinformation and hostility from the public.
- **Transformation:** With sustained engagement, the community embraced the movement.

- **Outcomes:**
  - Velpur was declared **child-labour free** on **October 2, 2001**.
  - Employers **wrote off debts worth ₹35 lakh**, freeing children from bonded labour.
  - Every **sarpanch signed an MoU** with the district administration to ensure school enrolment.
  - Local boards declared: **"There is no child labour in our village."**
  - Recognition from **ILO**, **VV Giri National Labour Institute** and **former President APJ Abdul Kalam**.
  - A rare example of **sustained success for over two decades**.

Takeaway: Velpur's success shows that **social reform is sustainable only when it becomes a people's movement**, backed by local leadership and supported by state capacity.

The fight against child labour is not just a legal or policy challenge—it is a **moral imperative**. While India has taken steps forward, the **Velpur model** proves that the **real change begins at the grassroots**, with communities taking charge of their children's futures. Scaling such models with government support, legal enforcement and civil society participation can help India meet the **SDG 8.7** target and ensure every child gets a fair start in life.

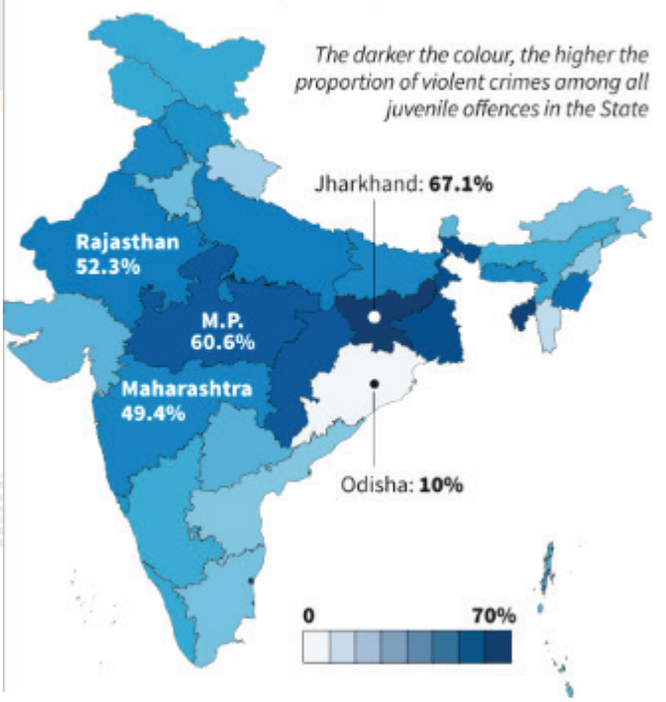
Juvenile Crimes in India

Syllabus Mapping: GS-Paper 2, Social Justice, Vulnerable Sections

Context

Recently released British mini-series **Adolescence** has reignited global discussions on the rising incidence of **juvenile violent crimes**, especially among boys.

Map 4: The proportion of violent crimes among all juvenile offences within each State (2017-2022)



Status of Juvenile Crimes in India

- **Overall decline but growing violence:** The total number of juveniles in conflict with the law declined from **37,402 in 2017 to 33,261 in 2022.**
  - However the share involved in violent crimes **increased from 32.5% in 2016 to 49.5% in 2022 (NCRB, 2023).**
  - In **2016**, 32.5% of juveniles were apprehended for violent offences.
  - By **2022**, this rose sharply to **49.5%** — nearly **half** of all juvenile apprehensions.
- **Nature of Violent Crimes**: A police study found that between January 2022 and May 2024, 259 minors were involved in incidents of murder, attempted murder, rape, robbery and extortion
- **State-wise Trends**: **Madhya Pradesh** (20%) and **Maharashtra** (18%) lead in the total number of juvenile violent crimes (2017–2022).
  - **Jharkhand** had the **highest share** of violent crimes among all juvenile offences (67%).
  - **Delhi** accounts for 6.8% despite its smaller size, likely due to better reporting.
- **Regional Hotspots**: Central and eastern Indian States like **Madhya Pradesh**, **Chhattisgarh**, and **Tripura** are major **hotspots** for violent juvenile crimes.
  - **Odisha**, in contrast, reported only **10%** of juvenile crimes as violent.

Reasons Behind the Rise in Juvenile Crime in India

- **Family Breakdown & Parental Issues:** Broken families, domestic violence and poor parenting are some of the leading causes of juvenile crime in India. Children who grow up in such an environment often lack emotional support and may turn to criminal activities to feel a sense of belonging.
- **Poverty & Economic Pressure:** Financial hardship drives minors toward crime for **quick money** or a more glamorous lifestyle.
- **Lack of Education:** Children who come from impoverished backgrounds may not have access to education or job opportunities, leaving them vulnerable to criminal activities.

- **Peer Influence & Gang Culture:** Teenagers often join gangs or criminal groups to feel accepted, respected, or protected.
  - Social media platforms encourage committing and flaunting crimes (**Eg:** bike thefts for Instagram fame).
- **Mental Health & Psychological Stress:** Children facing stress, anxiety, trauma or emotional issues may act out violently or behave impulsively. Lack of mental health support makes this worse.
  - According to **UNICEF data**, 1 in 7 Indian adolescents faces mental health issues.
- **Easy Access to Weapons:** In Delhi, the availability of **"dragon knives"** has led to violent assaults and even homicide by minors.
- **Urbanization & Lack of Supervision:** In metropolitan areas, working parents may not have time to watch over their children. As a result, children may roam freely, fall into bad company or be recruited by street gangs.
  - NCRB data shows higher rates of juvenile crime in urban areas like **Mumbai, Delhi, and Bengaluru**.
- **Media & Cultural Influences:** Exposure to **violent content** in films, games,or social media can desensitize minors and normalize aggression.
- **Substance Abuse:** Easy access to alcohol, drugs, and inhalants contributes to impulsive and aggressive behaviour.

Measures Taken by Government to Address Juvenile Crime

- **Juvenile Justice (Care and Protection of Children) Act, 2015**: It replaced the Juvenile Justice Act, 2000.
  - Allows **children aged 16–18** to be tried as adults in heinous crimes (e.g., rape, murder) after assessment by the **Juvenile Justice Board**.
  - Establishes **Child Welfare Committees (CWCs)** and **Juvenile Justice Boards (JJBs)** in each district.
  - Promotes **rehabilitation and social reintegration** through counselling, education, skill training.
- **Integrated Child Protection Scheme (ICPS) – now part of Mission Vatsalya:** It was launched in 2009; restructured under Mission Vatsalya (2021).
  - **Objective**: Provide institutional and non-institutional care to children in need, including those in conflict with law.
  - **Components**: **Child Care Institutions (CCIs)**, Funding for **Observation Homes**, **Special Homes** and **Aftercare Homes**.
- **Baal Swaraj Portal – by NCPCR**
  - Tracks children in distress, including **children in conflict with law**.
  - Helps monitor **cases, rehabilitation and repatriation**.
- **Collaboration with NGOs and UNICEF:**
  - NGOs like **Prayas, Childline India Foundation, Bachpan Bachao Andolan** work with government agencies to prevent juvenile crimes and rehabilitate affected youth.
  - UNICEF provides technical support for child protection systems.

Challenges in Implementation

- Poor infrastructure and overcrowding in **Child Care Institutions (CCIs).**
- Lack of trained staff in **Juvenile Justice Boards (JJBs)**.
- Delay in trials and case disposal.
- Inadequate **psychological and mental health support**.
- **Stigma** faced by rehabilitated juveniles in society.

Way Forward

- **Strengthen Rehabilitation Over Punishment:** Ensure **counselling, therapy**, and reintegration support.
  - **Eg:** Norway's juvenile justice focuses fully on rehabilitation and has low reoffending rates.
- **Mental Health Services in JJBs and CCIs:** Deploy trained **child psychologists and counsellors**. Mandatory mental health assessments for juveniles in conflict with law.
- **Skill Development and Education:** Make **digital education, sports and arts** part of daily routine in Juvenile Homes.
- **Community-based Interventions:** Engage **Anganwadi workers, teachers, ASHAs** to identify at-risk children early. Promote **community mentorship programs** for vulnerable youth.
- **Use of Technology for Monitoring:** Expand platforms like **Baal Swaraj** for real-time tracking. Use **AI/analytics** to predict high-risk zones for juvenile crime.
- **Faster Judicial Processes:** Increase the number of Juvenile Justice Boards and train members in child psychology and rights. Ensure time-bound investigation and trial.

The need for gender equity in urban bureaucracy

Syllabus Mapping: GS-Paper 2, Social Justice, Issues related to Women

Context

A recent report by Janaagraha stressed that while women now make up nearly 46% of elected representatives in local governments, urban bureaucracies, especially planners, engineers and police—remain male-dominated, undermining inclusive governance.

Need of Urban Governance

- **Global Scenario:** More than 4 billion people (over half of the world's population), now live in urban areas.
  - Nearly **68%** of the global population is expected to reside in cities by **2050 (UN projections).**
- **India's Status:** Over **35%** of the population lives in urban areas in India and it is expected to surpass 600 million by 2030, over 800 million people by 2050, and is expected to grow over 60% of the population by the 2060s.

Data on Women in Governance

- **Women in Civil Services:** Only about 20% of IAS officers are women as of 2022.
- **Representation in ULBs:** While women hold over 46% of elected seats in urban local bodies, their administrative influence remains limited.
- **Police:** Only 11.7% of India's police personnel are women, mostly in non-field roles. (Bureau of Police Research & Development data).
- **STEM:** Women constitute only 14% of engineers in the workforce, despite making up 40% of STEM graduates.

Need of Gender Equity in Urban Bureaucracy

- **Inclusive Governance and Representation:**
  - Women form nearly **50% of India's urban population** but are underrepresented in decision-making roles in municipal corporations, planning bodies, and urban services.
  - Gender equity ensures that **women's urban needs**—like safety, mobility, sanitation, housing—are included in planning and implementation.
- **Infrastructure Prioritization:** Women bureaucrats often bring unique perspectives that help design **gender-sensitive infrastructure**, such as: Well-lit streets, Accessible public toilets, Safe public transport, Childcare facilities etc.
  - **Eg:** 84% of women in Delhi/Mumbai use shared or public transport (ITDP-Safetipin study).
  - **Eg**: In Pune, women-led urban planning initiatives led to the creation of safer streets and better anganwadi infrastructure.
- **Empathy in Law Enforcement:** Women in police roles reduce reporting barriers for domestic violence and sexual harassment.
- **Enhanced Stakeholder Communication:** Women bureaucrats often improve citizen engagement through inclusive and participatory methods.
- **Bridging Policy-Implementation Gaps:** Elected women in ULBs **(46%)** need bureaucratic counterparts to translate priorities into outcomes.
- **Role Models and Pipeline Building:** Increased representation encourages **young women to enter urban governance roles** (engineering, town planning, sanitation management etc.)

Government Initiatives

- **Constitutional and Legal Provisions:**
  - **74th Constitutional Amendment Act (1992):**
    - Mandates 1/3rd reservation for women in all urban local bodies (ULBs) — Municipal Corporations, Municipal Councils, Nagar Panchayats.
    - Includes seats reserved for SC/ST women.
    - Enables women's entry into **electoral urban governance**.
  - **State-Level Extensions:** States like **Bihar, Odisha, Madhya Pradesh, Kerala, Rajasthan** extended reservation to **50%**.
- **Gender-responsive budgeting (GRB):** India adopted a Gender Budget Statement in 2005-06, but only a few states have operationalized it.

Global Best practices Related to Gender Budgeting

- **Philippines:** Mandatory 5% allocation of local budgets to gender programmes.
- **Uganda:** Gender equity certificates are required before fund approvals.
- **South Korea:** Uses gender impact assessments to redesign public transport and urban spaces

- **Urban Development Schemes with Gender Components**
  - **Smart Cities Mission:** Encourages cities to adopt **gender-inclusive urban planning**. Promotes initiatives like **safe public spaces**, smart lighting, CCTV monitoring, and **women-friendly transport**.
- **National Institute of Urban Affairs (NIUA):** It has developed frameworks for mainstreaming women-led urban governance.

Challenges to Gender-Inclusive Bureaucracy

- **Low Entry of Women in Key Urban Sectors:** Fewer women take up technical education due to social norms or lack of support. Safety concerns, long working hours and fieldwork deter many women.
- **Workplace Discrimination and Glass Ceiling:** Even when women enter bureaucracy, they face:
  - **Bias in promotions** (they're seen as less capable).
  - Lack of **mentorship or guidance**.
  - **Hostile work environments**—including sexist attitudes or exclusion from key decisions.
  - This results in very few women reaching top administrative posts like Municipal Commissioners or Chief Town Planners.
- **Lack of Gender-Disaggregated Data:** Most government departments do not collect or publish **separate data for men and women** on how they use public services like transport, sanitation, or healthcare.
  - Without this data, city policies are **based on male-centric assumptions** and do not reflect the real needs of women.
- **Tokenism in Gender Budgeting (GRB):** While many urban governments say they follow **Gender Budgeting**, in practice:
  - Allocated funds are small and **symbolic**.
  - There is **no clear goal or monitoring** of how this money improves women's lives.
- **Weak Institutional Mechanisms:** Cities lack: Gender audit systems, Gender Equality Committees etc. without such structures, **no one is responsible or accountable** for promoting gender equity in urban governance.
- **Cultural and Social Barriers:** Women are discouraged from taking up leadership roles or working in public life.
  - Married women in bureaucracy face challenges like: Frequent transfers, Household responsibilities, Lack of spousal support etc.
  - These pressures often lead women to **drop out or settle for less demanding roles**.

Way Forward: How to Build a Gender-Inclusive Bureaucracy

- **Encourage Women's Entry into Urban Sectors:**
  - Provide **scholarships and mentorship** for women in engineering, planning, and governance.
  - Run **outreach campaigns** to promote STEM and public service careers for girls.
- **Create Safe and Supportive Workplaces:**
  - Set up **internal complaint committees**, separate restrooms, and safe transport for female staff.
  - Offer **flexible working hours, maternity leave**, and **childcare support** in government offices.
- **Mandatory Gender Audits and Data Collection:**
  - Make it compulsory for city governments to collect **gender-disaggregated data** on usage of services like: Water and toilets, Public transport, Housing and slum redevelopment etc.
- **Make Gender Budgeting Real and Result-Oriented:** Link budgets with measurable impact on women's quality of life.
- **Empower Women Already in the System:** Provide **leadership training** to female councillors, engineers and officers.
- **Change Social Attitudes through Mass Campaigns:** Promote stories of successful women in governance.

Why India needs comprehensive school mental health programmes

Syllabus Mapping: GS-Paper 2, Social Justice, Mental Health

Context

India is facing a growing mental health crisis, with recent studies revealing high rates of depression, anxiety, and behavioural addictions, especially among youth.

Data on Mental Health in India

- According to the **National Mental Health Survey (2015-16)**: About 10.6% of India's population has faced mental health issues, with 13.7% affected at the time of the survey.
- **27%** of children/adolescents experienced depression; **26%** had anxiety disorders
- **Student suicide rates** are alarming, with a 32% increase from 2017 to 2022.
- **Behavioural addictions** (internet, social media, gaming) are rising, affecting up to 40.7% of students in some states.

Progress achieved so far

- **Decline in Suicide Rates:** India's suicide rate declined from 19.1 (2000) to 12.9 (2019) per 100,000 persons.

Reasons for Poor Mental Health Status in India

- **Lack of Awareness and Sensitivity:** In India, mental health issues are often **not regarded as healthcare concerns**.
- **Low Budget Allocation:** While developed countries allocate 5-18% of their healthcare budget to mental health, India allocates just around **1%**.
  - **Eg:** India spends less than ₹10 per capita on mental health annually.
- **Changed Lifestyle:** The increased use of social media has heightened stress and mental illness, particularly among young people.
- **Shortage of Trained Professionals: Student–counsellor ratio** is extremely poor: often **1 per 3000–5000 students**, against WHO norm of **1 per 250**.

2023 Parliamentary Standing Committee Report on Health and Family Welfare:

- **Number of working psychiatrists in India**: 9,000.
- **Required number of psychiatrists to meet WHO guidelines:** 36,000.
- **Number of psychiatrists entering the workforce annually:** 1,000.
- **Time required to meet WHO guidelines at the current rate:** 27 years.

- **Lack of Mental Health Curriculum:** Most schools do **not have structured lessons** on emotional intelligence, stress management etc.
  - NEP 2020 promotes mental health, but implementation is weak or absent in many states.
- **Inadequate Teacher Training:** Teachers are not trained to:
  - Identify early signs of mental health distress (e.g., withdrawal, aggression).
  - Handle trauma, anxiety or depression sensitively.
- **Stigma Among Students and Parents:** Fear of being **labelled 'mad' or weak** leads students to hide distress. Parents also **discourage counselling**, fearing social judgement or career setbacks.
- **High Academic Pressure: Competitive exams, board results, peer comparison** create stress and anxiety.
  - **Eg:** Suicides in coaching hubs like Kota.
- **Unregulated Social Media & Cyberbullying:** No effective digital literacy education to prevent **addiction, bullying, or self-harm risks**. Teenagers often struggle with **identity issues, peer pressure, and body image**.

Why Do Schools Hold Strategic Importance?

- **Early Intervention:** Schools can identify, address, and prevent mental health issues early, especially among vulnerable youth.
- **Influence on Risk Factors:** Schools impact socio-emotional development, help build resilience and can counteract risk factors like bullying and academic stress.
- **Policy Emphasis:** WHO and global mental health plans highlight schools as critical platforms for suicide prevention, awareness, and skill development.
- **Community Impact:** Schools can engage parents and communities, increase mental health literacy, and destigmatize seeking help.

Role of Educational Regulatory Bodies in Mental Health

- **Mandating mental health audits** (from primary to higher education) for accreditation.
- Integrating tele-counselling skills into psychology and social work courses.
- Enforcing the establishment of **Mental Health Advisory Boards (MHABs)** (as per directives from the National Council of Educational Research and Training (NCERT)) in institutions.
- Supporting the training and formation of school counsellor teams led by mental health professionals.

Key Initiatives Taken By The Government Of India For Improving Mental Health Care:

- **National Mental Health Survey (NMHS):** Conducted by the **National Institute of Mental Health and Neurosciences (NIMHANS)** in Bengaluru in **2016**.
  - Found that approximately 10.6% of adults over the age of 18 suffer from mental disorders.
- **District Mental Health Programme (DMHP):** Launched as a key component of the **National Mental Health Programme (NMHP)**.
  - Implemented in **767 districts** with support for States/UTs under the **National Health Mission**.

  - Aims to provide:
    - Suicide prevention services.
    - Workplace stress management.
    - Life skills training.
    - Counselling for schools and colleges.
  - Offers outpatient services, psycho-social interventions, continued care for severe mental disorders, drugs, outreach programs, and ambulance services through district hospitals, **Community Health Centres (CHCs)**, and **Primary Health Centres (PHCs)**.
  - Provides a **10-bed in-patient facility** at the district level.
  - Over **1.73 lakh Sub Health Centres (SHCs)** and **PHCs** have been upgraded to **Ayushman Arogya Mandirs**, integrating mental health services.
- **Expansion of Tertiary Care Component:** Expansion of the NMHP's tertiary care component to enhance mental healthcare capacity.
  - **25 Centres of Excellence** sanctioned to increase intake in postgraduate departments specialising in mental health and provide tertiary treatment facilities.
  - Strengthening of **47 postgraduate departments in mental health** across **19 government medical colleges**.
  - Mental health services provisioned in **22 newly established AIIMS**.
  - There are **47 government-run mental hospitals** in India, including three central mental institutions:
    - **National Institute of Mental Health and Neuro Sciences**, Bengaluru.
    - **Lokopriya Gopinath Bordoloi Regional Institute of Mental Health**, Tezpur, Assam.
    - **Central Institute of Psychiatry,** Ranchi.
- **National Tele Mental Health Programme (NTMHP):** Launched on **October 10, 2022**, to improve access to quality mental health counselling and care.
  - **53 Tele MANAS Cells** operational across **36 states/union territories**.
  - As of **October 8, 2024, over 14.5 lakh calls** have been handled through the helpline.

Way Forward

- **Mandatory Mental Health Curriculum:** Integrate age-appropriate mental health education and life skills in school syllabus.
- **Hiring of School Counsellors:** Ensure every school has access to trained psychological counsellors.
- **Capacity Building of Teachers:** Train teachers to identify early signs of distress and provide basic first-line psychological support.
- **Parental Involvement:** Educate parents on adolescent mental health and break stigma at the family level.
- **Digital Mental Health Tools:** Develop helplines, apps, and AI-enabled tools for counselling and outreach (e.g., MANAS App by GoI).
- **Structural Reforms:** Mandate school mental health audits for accreditation from primary to higher education.
- **Increase Budgetary Support:** Allocate specific funding under SSA or PM-POSHAN schemes to promote school mental wellness infrastructure.
- **Integration of Services:** Incorporate digital mental health tools (e.g., Tele-MANAS) and establish Mental Health Advisory Boards (MHABs) in schools.

Civil Registration and Vital Statistics (CRVS)

Syllabus Mapping: GS-Paper 1, Society, Population

Context

Governments across the Asia-Pacific region, including India, adopted a resolution at the **Third Ministerial Conference on CRVS** held in Bangkok, committing to achieve **universal birth and death registration by 2030**.

About CRVS

- **CRVS** refers to the **systematic recording of vital events** like **births, deaths, marriages, divorces** and **causes of death** by government authorities.
- It provides **legal documentation** (like birth/death certificates) and **vital statistics** that are crucial for governance, public health, and policymaking.

CRVS in India

- Governed by the **Registration of Births and Deaths Act, 1969.**
- Implemented by the Registrar **General of India (RGI)** under the **Ministry of Home Affairs**.
- **eCRVS portal** and **Civil Registration System (CRS)** are used to digitize and modernize the process.

Importance of CRVS

- **Legal Identity & Rights:** Birth registration ensures **legal identity**, citizenship, and access to **education, healthcare, and welfare schemes**. Death registration helps settle inheritance, pensions and remove ghost beneficiaries from databases.
- **Public Health Monitoring:** Accurate **cause-of-death data** helps track disease burden (e.g. cancer, cardiovascular diseases, maternal mortality). It is crucial for tracking **pandemics and epidemics**.
- **Governance & Planning:** Enables **evidence-based policy** on population, healthcare, social protection and education.
  - Helps in planning for **SDGs**, particularly: such as
    - SDG 3 (Health)
    - SDG 16.9 (Legal Identity for all)
    - SDG 17.18 (Capacity-building for data disaggregation)
- **Disaster Management & Migration:** Registration systems support families in obtaining death certificates and assistance in natural disasters/conflicts.
- **Lack of Legal Identity = Risk of Exploitation:** People without official documents are more vulnerable to: **Human trafficking, Child marriage, Forced labour etc.**

CRVS Summit

- **CRVS Summits** are high-level international ministerial conferences focused on strengthening **Civil Registration and Vital Statistics (CRVS)** systems, particularly in the **Asia-Pacific** region.
- They are organised by the **United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)** in partnership with WHO, UNICEF, UNHCR, World Bank and other development agencies.

Key Outcomes of the 2025 Bangkok CRVS Summit

- **Extended Timeline:** The **CRVS Decade** (earlier 2015–2024) is now extended to **2030**, aligning with the Sustainable Development Goals (SDGs).
- **Renewed Commitments:** All member countries pledged to **achieve 100% birth and death registration**.
- Digital Upgrades Emphasis on:
  - AI-based registration tools
  - Full digitisation of civil records
  - **Linking databases** across departments (interoperability).
- **Equity and Privacy Focus:** Countries agreed to make CRVS systems:
  - More inclusive for **women, minorities, and vulnerable groups**
  - **Data-protected**, with strong privacy laws to avoid misuse of personal information
- **Progress Noted:**
  - **India's birth registration** rate rose from **86% to 96%**.
  - **29 countries** in the Asia-Pacific now have **over 90% birth registration coverage**.

Challenges in CRVS Implementation in India

- **Incomplete Coverage:** Despite improvements, **death registration (88%)** still lags behind **birth registration (~96%)** (RGI 2023). **Rural, tribal and marginalized communities** often remain unregistered due to poor access.
- **Low Medical Certification of Deaths (MCCD):** Only about **22% of registered deaths** in India are medically certified for cause of death (CRS 2022). Majority of deaths occur **outside hospitals**, especially in rural areas, with no formal cause reported.
- **Geographic and Socio-Economic Barriers: Remote areas** (e.g., Himalayan and tribal regions) face logistical challenges—lack of transport, internet or nearby registration centres. **Illiteracy and poverty** lead to low awareness about the need and benefits of registration.
- **Digital Divide:** With increasing **digitisation of CRVS**, those without access to internet, smartphones, or digital literacy are left behind. Affects **tribal populations, elderly, women**, and **low-income rural households**.
- **Inter-Departmental Coordination Issues:** CRVS responsibilities are shared between:
  - Ministry of Home Affairs (Registrar General of India)
  - Ministry of Health (MCCD data)
  - State/local bodies (registration infrastructure)
  - This leads to **data silos**, delayed reporting and inconsistent standards.
- **Lack of Real-Time Data and Monitoring: Delayed digitisation** and poor data analytics tools prevent real-time tracking of vital statistics.

- **Stigma and Cultural Norms: Unwed mothers**, **surrogacy births**, **stillbirths**, and **infant deaths** often go unreported due to societal stigma. Gender bias leads to **underreporting of girl child births** in some areas.

Way Forward

- **Achieve Universal Coverage: 100% registration** of births and deaths must be mandated and tracked at district/block levels.
  - Special campaigns in **remote, tribal, and conflict-prone regions**.
- **Improve Medical Certification:** Make **MCCD mandatory** for all institutional deaths. For home deaths, roll out **WHO Verbal Autopsy tools**, with training for ASHA/ANM workers and panchayats.
- **Train Local Officials and Health Workers:** Capacity building of: Local registrars, ASHA, Anganwadi and health centre staff. Use Gram Sabhas and SHGs to monitor CRVS coverage at the village level.
- **Enhance Data Use and Analytics:** Use CRVS data for:
  - Real-time health planning **(Eg:** maternal mortality, disease surveillance)
  - Targeted delivery of welfare schemes **(Eg:** pensions, immunization)
  - Integrate with SDG dashboards and health information systems.
- **Strengthen Digital CRVS Infrastructure:** Develop a **national, interoperable, real-time CRVS database** that links: Aadhaar, Health records (Ayushman Bharat Digital Mission), Census/NPR.

TOPICS FOR PRELIMS

National Polio Surveillance Network (NPSN)

Context

The Union Government is planning to gradually phase out the National Polio Surveillance Network (NPSN) and reduce the number of centres from 280 to 140 by 2026–27.

About National Polio Surveillance Network (NPSN)

- NPSP is a collaborative initiative between the Government of India and the World Health Organization (WHO), established in 1997.
- **Objective:**
  - Detecting and controlling polio and other vaccine-preventable diseases.
  - To monitor immunisation campaigns and ensure zero transmission.
- **India's Polio Eradication Journey:**
  - **Last Reported Case:** India reported its final case of wild poliovirus on January 13, 2011.
  - **Polio-Free Certification:** Following three consecutive years without any new cases, the **WHO declared India polio-free on March 27, 2014.**
  - **India's Strategy:** Used both OPV and IPV; OPV was preferred for mass use due to ease and gut immunity.
- NPSP will merge with **Integrated Disease Surveillance Programme (IDSP).**

Polio Virus

- Polio is a viral infectious disease that can cause irreversible paralysis and even death by affecting the nervous system.
- **Transmission:** The virus primarily spreads through the faecal-oral route and can multiply in the intestine, where it can invade the nervous system.
- **Target Group:** mainly affects children under five.
- **Vaccines:**
  - **Oral Polio Vaccine (OPV):** Administered as a birth dose, followed by three primary doses at 6, 10, and 14 weeks, and a booster dose at 16-24 months.
  - **Injectable Polio Vaccine (IPV):** This vaccine is given as an additional dose along with the third DPT (Diphtheria, Pertussis, and Tetanus) vaccine under the Universal Immunization Programme (UIP).
- **Difference between Wild Polio virus & Inactivated Polio virus**
  - **Wild poliovirus** is the naturally occurring strain of the poliovirus that causes the disease polio:
  - **Inactivated poliovirus** is a safe, dead version used in polio vaccines to prevent the disease.

Measles

Context

Recently the Ministry of Health and Family Welfare has launched the National Zero Measles-Rubella Elimination campaign 2025-26.

About Zero Measles-Rubella Elimination Campaign

- It is a national immunization initiative to eliminate measles and rubella, two highly contagious viral diseases affecting children.
- **Aim:** Achieve zero transmission of measles and rubella by 2026 through 95%+ vaccination coverage in all districts.
- The government has launched the campaign under the **'ACT NOW' strategy.**
- Under the **Universal Immunisation Programme (UIP)**, the MR vaccine is provided free of cost to all eligible children.
- The Union Government has set a **target to eliminate both diseases by 2026.**

About Measles

- It is a highly contagious disease caused by the **measles virus (Single-stranded, enveloped RNA virus).**
- **Transmission: Coughs and sneezes** of infected individuals. It can also spread through **direct contact with nasal or oral secretions**.
- Symptoms can lead to serious complications such as **ear infections, diarrhea, pneumonia, death (fatality rate** is between **5–10%)**
- Measles is a **human-only disease** and does **not infect other animals**.
- The **first effective vaccine** was introduced in **1963**.
- Vaccination reduces the **risk of contracting measles by 20 times**.

Global Gender Gap Report - 2025

Context

Recently, the Global Gender Gap Index 2025 was released by WEF.

About Global Gender Gap Index Report 2025

- It is an annual report that benchmarks gender parity across countries, helping track progress toward closing gender gaps.
- **Assessment Criteria:** Economic Participation and Opportunity, Educational Attainment, Health and Survival and Political Empowerment.
- **Top 5 Countries**: Iceland, Finland, Norway, United Kingdom, New Zealand.
- **Global gender gap closed to 68.8%**, strongest progress since the pandemic.
- At the current rate, **full parity will take 123 years**.
- **Women make up 41.2% of the workforce** but hold only **28.8% of leadership roles**

India's Performance

- **India's rank: 131 out of 148 countries** (slipped two places from 129th in 2024).
- **Parity Score:** 64.1%, placing India among the **lowest in South Asia**.
- **Positives:**
  - **Economic Participation improved** by 0.9 points to 40.7%, with earned income parity rising to 29.9%
  - **Educational Attainment** score reached 97.1%, driven by improved female literacy and tertiary enrolment
  - **Health and Survival showed gains** due to better sex ratio at birth and healthy life expectancy
- **Negatives:**
  - Political Empowerment fell for the second consecutive year
    - Female MPs dropped from 14.7% to 13.8%
    - Women ministers fell from 6.5% to 5.6%
- **Regional Comparison (South Asia):**
  - **Bangladesh**: Best performer, ranks **24th** globally.
  - **Nepal (125)**, **Bhutan (119)**, **Sri Lanka (130)** – all ahead of India.
  - Only **Maldives (138)** and **Pakistan (148)** rank lower than India.

About World Economic Forum (WEF)

- It is an **international non-governmental organization** focused on **Public-Private Cooperation. (HQ-Geneva, Switzerland)**.
- **Founded:** January 1971 by **Klaus Schwab**, a German engineer and economist.
- **Purpose:** Brings together leaders from politics, business, culture, and civil society to **shape global, regional, and industry agendas**.
- It **does not hold any independent decision-making power**.
- **Reports Published by WEF:** Global Competitiveness Report, Global Information Technology Report, Global Gender Gap Report, Financial Development Report etc.

Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY)

Context

According to a recent report Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) has saved over ₹1000 crore in out-of-pocket medical expenses within just one year in Bihar.

About PM-JAY

- PM-JAY is the **world's largest government-funded health insurance scheme.**
- Beneficiary households are selected based on deprivation and occupational criteria from the **Socio-Economic Caste Census 2011 (SECC 2011)** for both rural and urban areas.
- **Implementing Agency:** National Health Authority.
- **Features:**
  - **Benefits:** Health coverage of **₹5 lakhs per family per year** for **secondary and tertiary care hospitalization**.
  - Coverage is available at **both public and private** empanelled hospitals across India.
  - Beneficiaries receive **cashless access to healthcare services** at the point of service (hospital).
  - **No restrictions** on family size, age, or gender for eligibility.
  - Scheme benefits are **portable nationwide**, allowing beneficiaries to access cashless treatment at any empanelled hospital in India.

Pradhan Mantri Ujjwala Yojana (PMUY)

Context

The **Pradhan Mantri Ujjwala Yojana (PMUY)** completed **9 years** on **May 1, 2025**, marking a major step in providing clean cooking fuel to poor households across India.

About Pradhan Mantri Ujjwala Yojana (PMUY)

- **Nodal Ministry:** Ministry of Petroleum and Natural Gas (MoPNG).

- **Aim:** To provide **clean cooking fuel (LPG)** to **rural and deprived households**.
  - Reduce deaths caused by the use of unclean cooking fuels.
  - Prevent respiratory illnesses in children due to indoor air pollution.
- **Target Beneficiaries:** Women from BPL households, including SC/ST communities, those under Pradhan Mantri Awas Yojana (Gramin), Most Backward Classes, Antyodaya Anna Yojana (AAY) and more.
- **Financial Assistance:** The government provides a cash subsidy of Rs. 1600 (for a 14.2kg cylinder) covering security deposit, regulator, hose, and other connection charges.
  - The first refill and stove are also provided free of cost.
- **Ongoing Expansion:** The scheme has been extended to release an additional 75 lakh connections over three years (FY2023-26), with a current beneficiary count exceeding 10.27 crore (as of March 1st, 2024).

Dharti Aba Janjatiya Gram Utkarsh Abhiyaan (DAJGUA)

Context

Centre has sanctioned over **300 FRA cells in 18 States/UTs under the DAJGUA scheme** to fast-track and support the implementation of the Forest Rights Act (2006).

About Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DAJGUA)

- It is a **government campaign** launched to **improve the quality of life in tribal villages**.
- **Launched in:** October 2024
- **Aim:**
  - Identify and fill gaps in development in tribal-majority villages
  - Bring basic services like electricity, clean water, healthcare, roads, and education
  - Ensure last-mile delivery of government welfare schemes to every tribal household
- **Approach:**
  - Implements **25 interventions** through **17 line ministries** of the Union Government.
  - Focuses on **convergence, outreach and saturation** of welfare schemes

Forest Rights Act (FRA), 2006

- **Purpose**: To recognize and secure the rights of Scheduled Tribes (STs) and Other Traditional Forest Dwellers (OTFDs) over forest lands and resources.
- **Objectives:**
  - **Recognition of Historical Rights** over forest land and resources.
  - **Protection of Livelihoods** for forest-dependent communities.
  - **Empowerment of Communities** through legal ownership and management rights.
- **Types of Rights Recognized**
  - **Individual Rights:** Ownership and access to forest land for cultivation and habitation (up to 4 hectares per family).
  - **Community Rights:**
    - Use of **Minor Forest Produce** (e.g., bamboo, honey, lac).
    - **Grazing rights** and access to **water bodies**.
    - Rights to **conserve and manage** forest areas collectively.

One Stop Centre Scheme

Context

In its recent report parliamentary committee on Health and Family Welfare flagged concerns over underutilisation of funds and improper functioning.

About the Scheme

- It was launched in April, 2015, by the Ministry of Women and Child Development (MWCD).
- **Aim:** To support women affected by **violence in private and public spaces**.
- It was integrated into the **Sambal sub-scheme** under **Mission Shakti** from 2022–23.
- **Key Services Provided:**
  - **Emergency rescue & coordination** with police and ambulance services.
  - **Medical aid** through referral to nearest hospitals.
  - **Psycho-social counselling** by trained professionals.
  - **Legal assistance & counselling** through empanelled legal experts.
  - **Temporary shelter** (up to 5 days) for women and their minor children.
  - **Video conferencing** facility for court or police statements.
- **Target Beneficiaries:**
  - **All women**, including girls below 18 (with Juvenile Justice & POCSO Act provisions).
  - Victims of **physical, sexual, psychological, emotional or economic abuse**.
  - Survivors of **domestic violence, trafficking, acid attacks, honour crimes** etc.

e-Rakt Kosh

Context

The Health Ministry is planning to integrate the country's Rare Donor Registry with the e-Rakt Kosh.

What is e-Rakt Kosh Platform?

- It is a national digital platform that provides comprehensive information on blood banks and blood availability across India.
- **Developed by:** C-DAC under the Blood Cell initiative of the National Health Mission, Ministry of Health and Family Welfare.
- **Key Features:**
  - Offers citizen-centric services with real-time information from blood banks throughout the country.
  - Delivers an end-to-end IT solution for efficient workflow management in blood banks.
  - Accessible via web browsers and mobile applications on both Google Play Store and iOS.
  - Seamlessly integrated with UMANG, e-Hospital, National Health Portal, and flagship C-DAC products such as e-Sushrut and e-Upkaran.

Rare Donor Registry of India (RDRI)

- **It is a National database** of rare blood group donors.
- **Launched by:** ICMR-National Institute of Immunohaematology (NIIH)

NAVYA Initiative

Context

The Union Government has recently launched **NAVYA initiative** under the **Viksit Bharat@2047 vision**.

About NAVYA Initiative

- **NAVYA stands for** Nurturing Aspirations through Vocational Training for Young Adolescents.
- It is a **joint pilot initiative** by:
  - **Ministry of Women and Child Development (MWCD)**
  - **Ministry of Skill Development and Entrepreneurship (MSDE)**
- **Key Features:**
  - **Target Group**: Adolescent girls aged **16–18 years** with a **minimum qualification of Class 10**.
  - **Aim:** To provide **vocational training**, especially in **non-traditional job roles** to break gender stereotypes.
  - **Coverage**: To be implemented in **27 districts across 19 states**, including: **Aspirational districts, Districts from North-Eastern States.**
  - Emphasizes **inclusion and regional balance** by reaching vulnerable and underserved populations.

UMEED Portal

Context

The Union government has recently launched UMEED Portal to digitize and streamline Waqf property registration.

About UMEED Portal

- **UMMED stands for** Unified Waqf Management, Empowerment, Efficiency and Development.
- It is a centralized digital platform for registering and regulating Waqf properties across India.
- **Purpose**: To **digitize the registration and management of Waqf properties** across India.
- **Nodal Ministry:** Ministry of Minority Affairs.
- **Objective**:
  - Ensure transparent and time-bound registration of Waqf properties.
  - Prevent encroachments and illegal sales.
  - Streamline administration of Waqf lands (estimated over 8 lakh properties in India).

Waqf Act, 2025 Amendment

- **The Waqf (Amendment) Act, 2025** seeks to give more powers to the **Central Waqf Council** for supervision.
- **Appeals Mechanism Introduced:** Decisions of Waqf Tribunals are now appealable in High Courts within 90 days—ensuring judicial oversight.
- **Mandatory Digital Registration:** Introduced a strict 6-month deadline for all Waqf property registrations.
- **Tribunal Empowerment:** Unregistered properties post-deadline will be automatically flagged as disputed and adjudicated by Waqf Tribunals.
- **Stronger Government Oversight:** Enhanced monitoring by State Waqf Boards and increased regulation of trusteeship.

Performance Grade Index 2.0

Context

The **Ministry of Education** released the **Performance Grading Index (PGI) 2.0** report for 2022-23 and 2023-24, ranking States/UTs on school education.

About Performance Grading Index (PGI) 2.0

- It is a data-driven assessment tool that evaluates the quality of school education across Indian States and UTs.
- PGI 2.0 is a revised version aligned with the **National Education Policy (NEP) 2020** and **Sustainable Development Goals (SDGs)**.
- It is released by the **Union Ministry of Education**.
- **Coverage:** Measures performance across **6 key domains** and **73 indicators**, including: Learning Outcomes, Access, Infrastructure & Facilities, Equity, Governance Processes& Teacher Education & Training.

- **Grading System:** Scores out of **1000 points**, categorised into **10 grades** from **Daksh (highest)** to **Akanshi-3 (lowest)**.

Key Highlights from PGI 2.0 (2023-24)

- **Top Performer:** Chandigarh
- **Lowest Performer:** Meghalaya
- **No State in Top Four Grades: No State/UT** qualified for **Daksh (951–1000)** or **Utkarsh** grades.
  - Reflects systemic issues in achieving excellence in education.
- **Overall State Progress: 24 States/UTs** showed improvement in scores.
  - However, **12 States/UTs** recorded a decline, indicating **uneven growth**.
- **Infrastructure Improvement: Delhi, Jammu & Kashmir and Telangana** demonstrated significant progress in **school infrastructure** and **learning environments**.
- **Learning Outcomes Concern: No State** reached **Daksh** in the Learning Outcomes domain.
  - Indicates persistent challenges in **basic literacy and numeracy**, especially at the foundational level.

Scores (% of total points)	Score range	Grade
91% to 100%	941–1000	Daksh
81% to 90%	881–940	Utkarsh
71% to 80%	821–880	Atti-Uttam
61% to 70%	701–820	Uttam
41% to 50%	641–700	Prachesta-
31% to 40%	581–640	Prachesta-
21% to 30%	521–580	Akanshi-1
Up to 10%	461–520	Akanshi-2
Up to 10%	401–460	Akanshi-3

SCIENCE & TECHNOLOGY

TOPICS FOR MAINS

India's nuclear energy laws

Syllabus Mapping: GS-Paper 3, Nuclear Technology

Context

- India aims to scale up its nuclear energy capacity from **8 GW to 100 GW by 2047** to meet clean energy goals.
- For this, it is considering amending its nuclear laws — the **Civil Liability for Nuclear Damage Act (CLNDA), 2010** and the **Atomic Energy Act (AEA), 1962** — to allow private and foreign companies to participate in building and operating nuclear power plants.

Current Status & Targets of Nuclear Energy

Current Status

- **Installed Nuclear Capacity**: ~ 8,180 MW (2025)
- **Operational Reactors**: 22 reactors.
- **Fuel Dependence**: Heavily reliant on imported uranium due to limited domestic reserves.
- **Technology**: Pressurised Heavy Water Reactors (PHWRs) dominate; Fast Breeder Reactors (FBRs) under development.

Targets

- 100 GWe by 2047 as part of "Viksit Bharat" vision.
- **Expanding PHWRs**: 700 MWe PHWRs are planned as the backbone of expansion.
- **Fast Breeder Reactors (FBRs)**: To enable closed nuclear fuel cycles.
- **Thorium-Based Reactors**: Developing Advanced Heavy Water Reactors (AHWRs) and Molten Salt Reactors (MSRs)
- **Bharat Small Reactors (BSRs)**: Small modular reactors for decentralized power supply.

Incidents Influencing Laws

- **Bhopal Gas Disaster (1984):** Led to the Supreme Court's "absolute liability" ruling in the Delhi Oleum gas leak case (1986), holding enterprises engaged in hazardous activities strictly liable for harm.
- **Fukushima Nuclear Disaster (2011):** Highlighted the catastrophic economic potential of nuclear accidents. Estimated cleanup costs ranged from ¥35 trillion to ¥80 trillion (₹20 lakh crore to ₹46 lakh crore). The accident also exposed design flaws (Mark I containment).
- **Three Mile Island Accident (1979):** Revealed that the reactor supplier, Babcock & Wilcox, had identified a safety hazard but failed to provide operators with clear instructions to mitigate it.

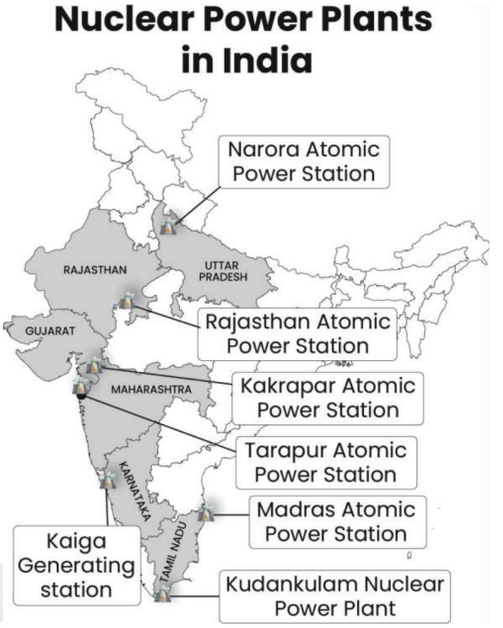
Legal Provisions

- **Civil Liability for Nuclear Damage Act, 2010 (CLNDA):** Holds the **operator solely liable** in case of a nuclear accident but also allows the operator to **seek recourse** against suppliers under certain conditions (Section 17(b)).
  - **Objective**: Provides **quick compensation** for nuclear accident victims.
  - **Strict & No-Fault Liability**: Operators are liable **regardless of fault**.
  - **Right to Recourse**: Operators can recover costs from suppliers in case of:
    - **Defective equipment or sub-standard services**.
    - **Deliberate acts causing nuclear damage**.
  - **Financial Security Requirement**:
    - **₹1,500 crore** financial cover for civil nuclear damage.
    - **₹2,150 crore+ damages** covered by the **central government**, up to **300 million SDRs (₹8,210–8,230 crore)**
- **Atomic Energy Act, 1962 (AEA):** Restricts nuclear energy activities (especially reactor construction and operation) to government entities or those authorised by the government.
  - **Private sector participation is currently barred** in nuclear power generation.

Need to amend Nuclear energy laws

- **Foreign Investment & Technology**: India's nuclear expansion goals require large capital, advanced designs (like SMRs), and foreign expertise.

- **Private Participation**: Current framework allows only government-run companies like Nuclear Power Corporation of India (NPCIL) to build and operate reactors.
- **U.S.-India Civil Nuclear Deal, 2008**:The full potential of the agreement remains unrealised due to India's stringent liability laws.
- **Foreign Suppliers Demand Legal Clarity**: Companies from the U.S., France, and Japan have **explicitly cited the liability law** as a reason for not entering India's market.
- **Legal Impediment to Domestic Supply Chains:** Indian suppliers have **refused to supply components** post-2010 due to fear of liability, affecting domestic capacity (e.g., Kovvada project).
- **SMRs Need Private and Foreign Innovation:** Newer, smaller modular reactors (SMRs) are **commercially attractive** and safer, but India needs external participation to develop them at scale.
- **International Norms (CSC):** The **Convention on Supplementary Compensation (CSC)** channels liability to operators and ensures swift compensation — a model India could adopt more fully.



Factors Influencing the Growth of Nuclear Power in India

- **Land Requirements**
  - Nuclear projects require large land areas.
  - As per **AERB guidelines**, a **1.5 km exclusion zone** must be maintained around reactors, prohibiting human habitation.
  - This zone is included in the total land acquisition for the project.
- **Fuel Requirements**
  - India follows a **closed fuel cycle** to maximize its **limited uranium reserves** while utilizing its **vast thorium deposits**.
  - Spent fuel is **reprocessed** to extract reusable uranium and plutonium, rather than being treated as waste.
  - **Reprocessing plants** at **Trombay, Tarapur, and Kalpakkam** use **PUREX technology**, operated by **BARC**.
- **Manufacturing Needs**
  - India has developed a **domestic supply chain** for nuclear reactor construction.
  - There is a need to **scale up production capacity** and **reduce costs** of key materials.
- **Manpower Requirements**
  - A **2006 DAE projection** estimated the need for:
    - **700 scientists & engineers** annually for R&D units.
    - **650 engineers** annually for public & industrial sectors.
  - India currently faces a **shortage of skilled nuclear professionals**.

Challenges in India's Nuclear Energy Expansion

- **Fuel Availability:** India has **limited uranium reserves** and relies on **imports**, affecting long-term fuel security.
- **Limited Contribution to Energy Mix: 22 operational reactors** and **8 under construction**, yet nuclear power contributes only **2%** of India's electricity.
- **High Cost of Nuclear Energy:** Estimated **₹27 per unit**, making it **less competitive** than solar and other renewable energy sources.
- **Nuclear Waste Management:** Nuclear fission generates **radioactive waste**, hazardous for **thousands of years**.
  - **Long-term disposal solutions** remain a major challenge.
- **Risk of Nuclear Accidents:** Historical disasters like **Chernobyl (1986) and Fukushima (2011)** highlight **catastrophic risks**.
  - **Eg: 650,000 acres** around Chernobyl are still uninhabitable after 30+ years.
- **Government Monopoly:** Nuclear power is **entirely operated by NPCIL**, limiting **private sector participation**.
- **Nuclear Liability Concerns: CLNDA, 2010** places **strict liability** on plant operators, discouraging private and foreign investment.
  - Suppliers can also be held liable, causing companies like **EDF (France) to stall projects like Jaitapur**.
- **Regulatory Uncertainty:** Need for **clearer policies** on **safety, security, and waste management** to promote sectoral growth.

Way Forward

- **Scaling Nuclear Energy with a Mix of Technologies:** Deploy **Small Modular Reactors (SMRs)** and **large reactors** to **reduce costs** and improve efficiency.
- **Expanding Indigenous Nuclear Reactors: Prioritize 700 MW PHWRs** (e.g., **Kakrapar, Gujarat**).
  - **15 additional PHWRs** under construction should be expedited.
- **Accelerating Thorium-Based Energy: Fast-track second & third-stage nuclear programs** to utilize **thorium reserves** for long-term sustainability.
- **Inclusion of Public & Private Sector:** Allow **NTPC & other PSUs** to enter nuclear energy.
  - Amend **Atomic Energy Act, 1962**, to **enable private sector participation**, especially in **SMRs**.
- **Policy & Regulatory Framework:** Establish a **National Nuclear Energy Policy** to **integrate nuclear energy with renewables** and ensure a **level playing field**.

AI and Biomanufacturing

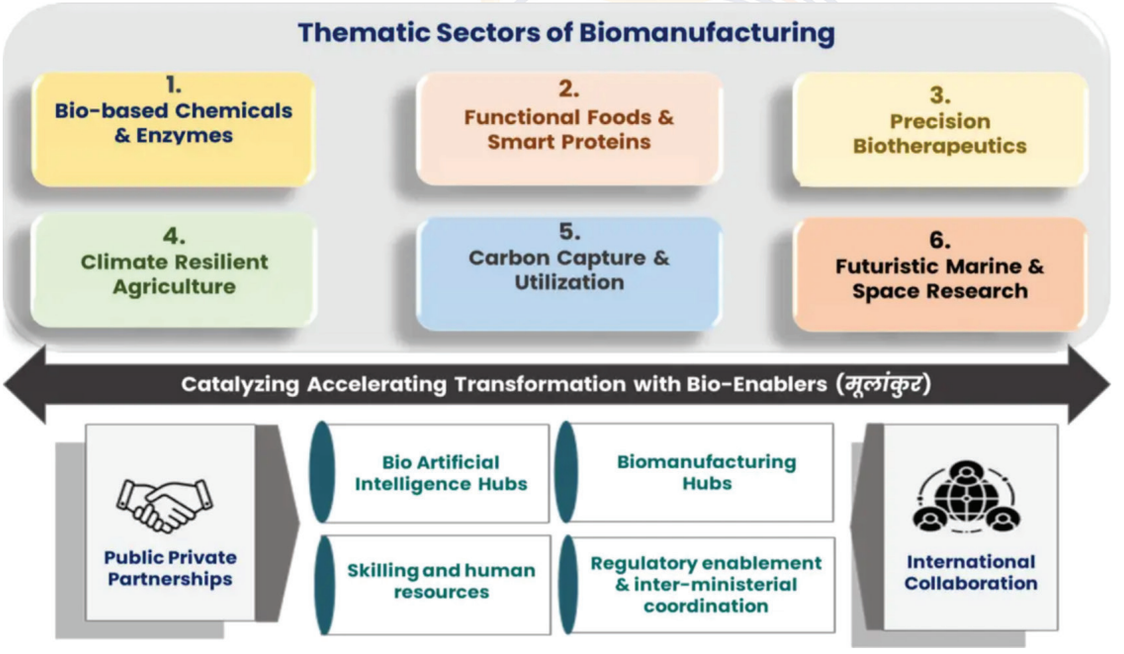
Syllabus Mapping: GS-Paper 3, AI and Biotechnology

Context

- India's BioE3 Policy and IndiaAI Mission signal a push to fuse artificial-intelligence tools with the nation's proven strengths in biomanufacturing.

About Biomanufacturing

Biomanufacturing involves the large-scale production of commercially valuable products using engineered microbial, plant, and animal (including human) cells, with growing levels of precision and control.



Significance of Biomanufacturing in India

Biomanufacturing holds the potential to shift India's current resource-intensive production systems towards more regenerative and circular models. It promotes sustainable and efficient use of biological resources, aligning with national goals for environmental protection and economic growth.

Key Areas of Impact

1. **Sustainable Production of Chemicals**
   - There is a growing global emphasis on eco-friendly manufacturing in response to climate change.
   - Biomanufacturing enables the bio-based transformation of chemical processes, especially for producing specialty chemicals, enzymes, and biopolymers.

- Techniques such as synthetic biology and genetic engineering are central to this transformation.

2. **Smart Proteins and Functional Foods**
   - Tools like metabolic engineering and synthetic biology can help tackle nutritional deficiencies.
   - They support the development of alternative proteins from novel sources (e.g., plants, algae, fungi, insects) and methods (e.g., fermentation, plant-based or cultured meat/dairy).
   - These smart foods offer a lower environmental footprint, enhanced food safety, and support animal welfare.
3. **Advanced Biotherapeutics (Cell & Gene Therapy)**
   - India can emerge as a global hub for R&D and manufacturing in futuristic health technologies.
   - Biomanufacturing enables scalable production of cell and gene therapies, mRNA-based treatments, and monoclonal antibodies.
   - This will drive access to personalized medicine and promote equity in healthcare delivery.
4. **Agricultural Innovation**
   - Biomanufacturing can revolutionize agriculture through:
     - Soil-microbiome research
     - Development of beneficial microbial communities
     - Creation of crop-specific bio-products for nutrition and protection
   - It can improve agricultural productivity, help mitigate climate risks, and ensure food security.
5. **Climate Change Mitigation**
   - Biomanufacturing supports India's Net-Zero by 2070 commitment by:
     - Decarbonizing hard-to-abate sectors
     - Converting captured CO_2 into valuable industrial products via microbial processes
6. **Blue Economy**
   - India's vast marine resources present opportunities to:
     - Reduce dependence on land-based agriculture
     - Develop marine-derived bioactive compounds, enzymes, and functional ingredients
7. **Space Nutrition**
   - For long-duration space missions, biomanufacturing can produce nutritionally balanced, safe, and shelf-stable meals.
   - These can be used in austere and remote environments, with minimal waste and optimal food quality.

Advantages of AI in Biomanufacturing

- **Optimizes Entire Production Workflow**: AI enables strain engineering, fermentation control, and design of experiments (DoE), leading to higher yields and consistent output.
  - **Eg; Emerging "Bio-AI Hubs" in the BioE3 blueprint**
- **Anomaly Detection**: Real-time monitoring with AI identifies process deviations and flags quality risks early, ensuring consistent product standards
- **Predictive Maintenance**: Sensor data and machine learning detect equipment anomalies early, reducing downtime and maintenance costs .
  - **Eg; Zymergen integrates AI**, robotics, and automation to engineer microbes that produce bio-based chemicals and materials—reducing trial-and-error cycles and boosting sustainability
- **Supply Chain Efficiency**: AI streamlines inventory and logistics by forecasting demand, reducing waste, and improving supply chain resilience
  - **Eg: AI-enabled logistics pilots for vaccine cold-chains**
- **Regulatory Compliance:** Automated report generation and compliance checks help navigate regulatory complexities more efficiently
- **Cost Reduction & Sustainability:** By minimizing batch failures and optimizing resource use, AI lowers production costs, boosts sustainability, and minimizes carbon footprint
  - **Eg: AION Labs developed DenovAI**, an AI-driven antibody discovery platform that expedites identification of therapeutic antibodies and binders—reducing both time and cost of early drug discovery
- **Accelerated Innovation**: Digital twins and AI-driven experiment design shorten R&D cycles and improve scalability, ensuring faster delivery of biotherapeutics
  - **Eg: Tata Consultancy Services' AI dashboards for clinical-trial quality**

Limitations of AI in Biomanufacturing

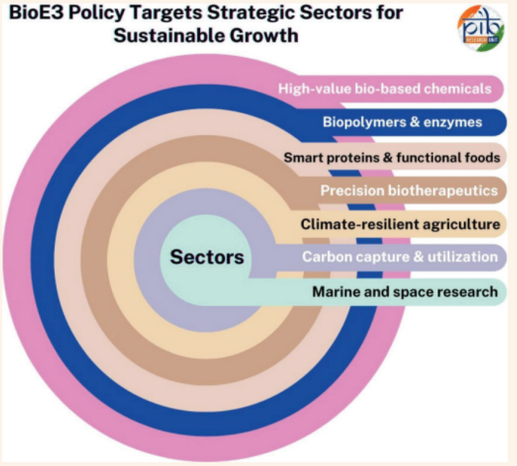
- **Data Quality & Volume:** AI systems require large, high-quality datasets — however, biopharma data is often fragmented or incomplete, limiting AI effectiveness
- **Black Box Complexity:** Many AI models lack transparency (black box), making it challenging to interpret outputs—a critical issue in regulated sectors
- **Regulatory & Compliance Gaps**: Existing regulations are not yet fully adapted to AI workflows, causing barriers to validation and certification
- **Integration Challenges:** Legacy systems and siloed infrastructure can impede seamless integration of AI tools into existing processes
- **Privacy Risks:** The heavy reliance on sensitive, proprietary data raises cybersecurity and confidentiality concerns
- **Skill Shortages & Workforce Readiness:** Implementation demands interdisciplinary expertise, yet many teams lack the necessary AI, ML, or data science capabilities

As technology continues to advance, early adopters of AI will be the ones leading the next generation of biopharmaceutical manufacturing. The companies that embrace AI now will not only improve their operations but will also drive the future of drug discovery, manufacturing, and patient care.

BioE3 Policy

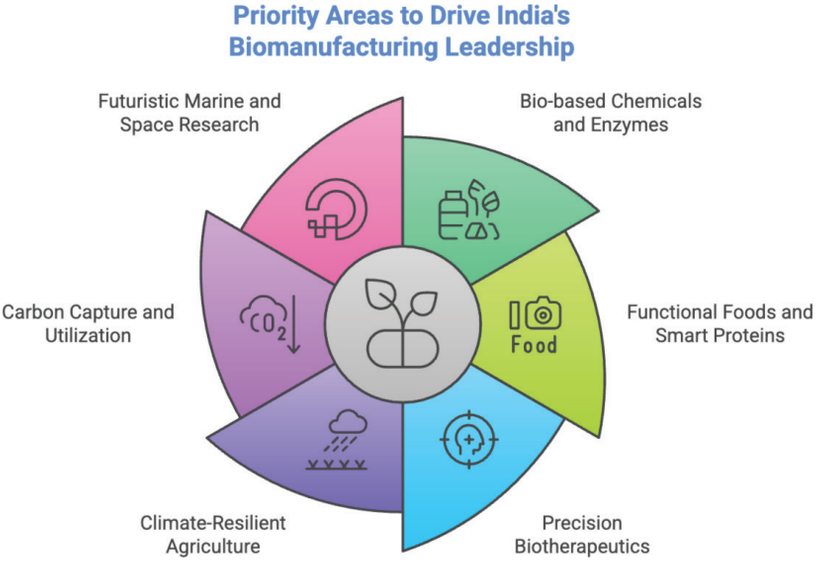
- The **BioE3 Policy, (Biotechnology for Economy, Environment and Employment)** led by the Department of Biotechnology, is designed to advance high-performance biomanufacturing in India.
- This involves the use of **cutting-edge biotechnological processes** to produce a wide range of bio-based products—from pharmaceuticals to materials—while also addressing critical challenges in agriculture, food systems, and environmental sustainability.
- In addition to fostering green, regenerative bioeconomic models, the BioE3 Policy will support the growth of India's skilled workforce, thereby contributing to significant employment generation.

Assam became the first state to approve BioE3 Policy (2025)



Objectives of the BioE3 Policy

- **Enhance research and innovation** to tackle pressing global issues such as climate change and enable sectoral decarbonization.
- Position **India as a global leader** in biomanufacturing by developing cutting-edge, scalable solutions.
- **Strengthen domestic capabilities in biomanufacturing** by integrating science, technology, engineering, and manufacturing ecosystems.
- **Accelerate the shift to biomanufacturing** by promoting the use of artificial intelligence and digital tools in omics technologies and upstream biotechnology.



- Establish **biomanufacturing infrastructure** such as dedicated hubs, biofoundries, and Bio-AI centres, co-located with essential resources to support scale-up and pre-commercial production.
- **Develop a highly skilled workforce** equipped to meet the demands of advanced biomanufacturing.
- Implement **regulatory reforms** aligned with international standards to ensure harmonization and ease of compliance.
- **Ensure a transparent and efficient patent system** for the utilization of genetic resources.
- **Foster sustainability** by leveraging the traditional knowledge of local communities across diverse ecosystems.
- Promote a **regenerative bioeconomy** guided by ethical, environmental, and biosafety principles.

Axiom 4 mission and India's space programme goals

Syllabus Mapping: GS-Paper 3, Space technology, Achievements of Indians in Science & Technology

Context

- The Axiom-4 mission recently docked to the International Space Station (ISS)
- Shubhanshu Shukla's trip to the ISS is a significant achievement to benefit the space program of India.

SpaceX Falcon 9 rocket with the Crew Dragon capsule carrying Indian astronaut Shubhanshu Shukla and three others lifts off from the launch pad at the Kennedy Space Centre, in Florida, USA. (@SpaceX via PTI Photo)

About Axiom 4 Mission

- The mission represents a **joint effort between Axiom Space, NASA, ISRO and the European Space Agency (ESA).**
- During their **14-day stay on the ISS**, the crew will carry out microgravity experiments, technology demonstrations, and public outreach activities.
- It is the **4th private astronaut mission to the International Space Station.**
- **Launch Site:** Kennedy Space Center in Florida
- **Launch Vehicle: SpaceX's Falcon 9 rocket.**

Mission Objectives

- **Scientific Research:** Conduct microgravity experiments in various fields, including medicine, materials science and technology development.
- **Commercial Development:** Axiom Space is testing technology and procedures for its future commercial space station.
- **International Collaboration:** It includes international astronauts, sponsored by their home countries or private institutions. This will boost International collaboration.
- **Space Tourism & Training:** To provide training and flight opportunities for private individuals interested in space travel.

About International Space Station

- The ISS is a habitable artificial satellite positioned in **low Earth orbit,** typically between **370 to 460 kilometers above the Earth's surface.**
- Its primary international partners include the **United States (NASA), European countries (via the European Space Agency), Japan (JAXA), Canada (CSA), and Russia (Roscosmos)**.
- The **station's first module was launched in 1998.**

- It is expected to function as an operational laboratory and orbital outpost through the year 2030.
- The **primary objectives of the ISS** are to enhance our understanding of space and microgravity conditions, facilitate scientific research, and exemplify international collaboration in space exploration.

Significance of Axiom 4 Mission

- **Pioneering Indian Human Spaceflight:** Participation in Ax-4 marks the return of an Indian to human spaceflight after **Rakesh Sharma in 1984, symbolizing India's renewed presence in global human space exploration.**
- **Cutting-edge Research:** The mission carries **seven Indian-led experiments in space biology and bioengineering**. These are crucial for developing life support systems and future deep-space missions.
- **Supports Gaganyaan & BAS Roadmap:** The Ax-4 mission acts as a technological and experiential bridge to the Gaganyaan human spaceflight program and the planned **Bharatiya Antariksh Station (BAS) by 2035,** providing vital hands-on exposure.
- **Capacity Building:** Provides Indian scientists, engineers, and mission planners with **direct experience in managing complex space missions**, space medicine, orbital operations, and bioastronautics—vital for future indigenous human spaceflight programs.
- **Science Diplomacy:** Enhances India's role in international scientific collaborations, fostering partnerships with agencies and other global research institutions.
- **STEM Inspiration:** It will inspire a new generation of Indians to pursue careers in STEM, space research, and innovation.
- **Boosts Indigenous R&D:** Accelerates domestic capabilities in microgravity research, bioengineering, and human spaceflight technologies, contributing to self-reliance and future exports of space technologies.

India's Space Programme Goals

India's space program is poised for significant advancements over the next two decades. India's space programme aims to secure strategic autonomy in space access by developing powerful and reusable rockets like ISRO's **Next Generation Launch Vehicle (NGLV)**.

ISRO's Road Map for the Next Two Decades

- **Gaganyaan Mission**: First Indian human-spaceflight mission, demonstrating India's human-spaceflight capability.
- **Space Station by 2030s**: India aims to establish its own space station in Earth's orbit.
- **Human-Spaceflight to the Moon**: Long-term goal to expand human-spaceflight capabilities to lunar missions.
- **Development Of Next Generation Launch Vehicle:**
  - **Features and Capabilities:**
    - **Heavy Lift Capability**: NGLV will **triple the payload capacity** of the current **LVM3** (Geosynchronous Satellite Launch Vehicle Mk III).
    - **Reusability**: Unlike current expendable rockets, parts of the NGLV will be **reusable**, offering significant **cost savings**.
  - **Benefits:**
    - Reduces the need for **miniaturization** or weight restrictions.
    - Expands possibilities for space missions.
  - **Comparison with Current Rockets**:
    - **LVM3**: India's most powerful rocket but expendable and limited to **4,000 kg** payload to Geostationary Transfer Orbit (GTO).
    - **SpaceX's Falcon 9**:
- The reusable version carries **5,500 kg** to GTO.
- Expendable version carries **8,300 kg** to GTO.
    - **SpaceX's Starship**: Reusable rocket capable of lifting **21,000 kg to GTO** and **100,000 kg to Low Earth Orbit**.

Current Gaps in India's Space Program

- **Heavy Lift and Reusable Rocket Technology:** ISRO's most powerful rocket, the LVM3, can lift only 4,000 kg to the Geostationary Transfer Orbit (GTO).
  - **Reusability** is still in the **developmental phase**, whereas global competitors like SpaceX have already operationalized reusable rockets such as Falcon 9 and Starship.
- **Private Sector Involvement:** India's private space sector is in its **nascent stages** compared to the U.S., where companies like SpaceX and Blue Origin lead innovation.
  - Limited opportunities for Indian startups to develop and launch heavy-lift rockets.

- **Space Infrastructure and Investment**: Insufficient investment in spaceports and ground infrastructure for frequent and diverse launches.
  - Limited testing facilities for advanced propulsion systems and human-spaceflight technologies.

Need for Heavy Lift Capability Rockets

- **Upcoming Space Missions Require Larger Payloads**: Missions like **Chandrayaan-3** and future human lunar missions require rockets that can carry heavier modules and equipment.
  - **E.g.,** India's next uncrewed lunar mission will need **two LVM3 rockets** to launch modules that are then assembled in space. A single heavy-lift rocket could simplify this process.
- **Global Competition and Technological Advancement**: Competitors like **SpaceX** have developed rockets capable of lifting significantly heavier payloads (e.g., **21,000 kg** to Geostationary Transfer Orbit by Starship).
  - To remain competitive and achieve **strategic autonomy**, India needs comparable heavy-lift capabilities.
- **Dependence on Foreign Launch Providers**: The **LVM3** can lift a maximum of **4,000 kg** to the Geostationary Transfer Orbit (GTO), which restricts mission capabilities.
  - **E.g.,** Recent launches of ISRO satellites like **GSAT-N2** had to rely on **SpaceX's Falcon 9** due to payload limitations.

Suggestions for improving India's space program

- **Accelerate Development of Reusable Rockets:** Prioritize development of ISRO's **Next Generation Launch Vehicle (NGLV)**.
  - Fund private-sector initiatives to develop **reusable heavy-lift rockets**.
  - Collaborate with **foreign partners** to fast-track the development of reusability technologies.
- **Boost Private Sector Participation:** Implement a **Public-Private Partnership (PPP)** model to incentivize private space companies.
  - Provide **milestone-based funding** for private firms to develop launch vehicles, satellites, and space technologies.
  - Facilitate collaboration between Indian startups and **global space firms** for technology transfer.
- **Increase Global Market Share:** Develop cost-competitive, reusable rockets to attract commercial launches.

TOPICS FOR PRELIMS

Battery Energy Storage Systems (BESS)

Context

India inaugurated South Asia's largest 20-MW BESS to boost power reliability.

About BESS

- They are technologies that **store electrical energy using batteries for later use**.
- **Key Components:**
  - **Battery Packs:** Store electrical energy.
  - **Power Conversion System (PCS):** Manages the charging and discharging processes.
  - **Energy Management System (EMS):** Controls and optimizes BESS operations.
- **Working**: Batteries **receive electricity from the power grid**, straight from the power station, or from a renewable energy source like solar panels or other energy source, and subsequently **store it as current to then release** it when it is needed.
- **Benefits:**
  - **Grid Stabilization:** Balances supply and demand, reducing fluctuations.
  - **Renewable Integration:** Stores surplus energy from sources like solar and wind for use during low production periods.
  - **Peak Load Management:** Supplies stored energy during peak demand, reducing strain on the grid.
  - **Energy Arbitrage:** Charges during low electricity price periods and discharges when prices are high, optimizing costs.
  - **Backup Power:** Provides emergency power during outages, enhancing reliability.

Japan's New AI Act

Context

In May 2025, Japan introduced a law on the Promotion of Research, Development, and Utilisation of Artificial Intelligence.

Key Provisions of Japan's AI Act

- **Creation of Strategic AI Headquarters:** A central AI command center is to be set up, involving the **Prime Minister and the full Cabinet.**
  - It will be responsible for drafting and implementing a basic national plan for AI research, development, and deployment.

- **Basic Principles for AI Development and Use**: Emphasizes enhancing international competitiveness, promoting the comprehensive and systematic development and utilization of AI, ensuring transparency in AI processes, and fostering international cooperation.

Significance of Japan's AI Act

- **Balanced Approach**
  Promotes AI innovation while ensuring ethical use and safety.
- **Tech Leadership**
  Reinforces Japan's role as a global tech leader and aligns with its tech-focused economic strategies
- **Public Trust**
  Boosts transparency and addresses concerns about privacy, jobs, and AI accountability
- **Business Integration**
  Supports AI adoption across industries, with major firms already implementing AI tools
- **Global Positioning**
  Demonstrates Japan's commitment to responsible AI amid international tech and security concerns

- **Defined Responsibilities for Stakeholders:** Assigns roles to national and local governments, research institutions, businesses, and citizens.
  - Businesses are expected to actively leverage AI to improve productivity, enhance operations, and foster new industries.
  - They are also required to cooperate with policy measures implemented by national and local authorities.
- **Government Policy Measures:** The national government is tasked with several policy measures, including promoting research and development, developing and sharing infrastructure necessary for AI advancement, monitoring global AI trends, and establishing countermeasures against misuse that infringes on individual rights.
- **National AI Strategy:** Mandates the formulation of a comprehensive national plan for AI development and utilization.

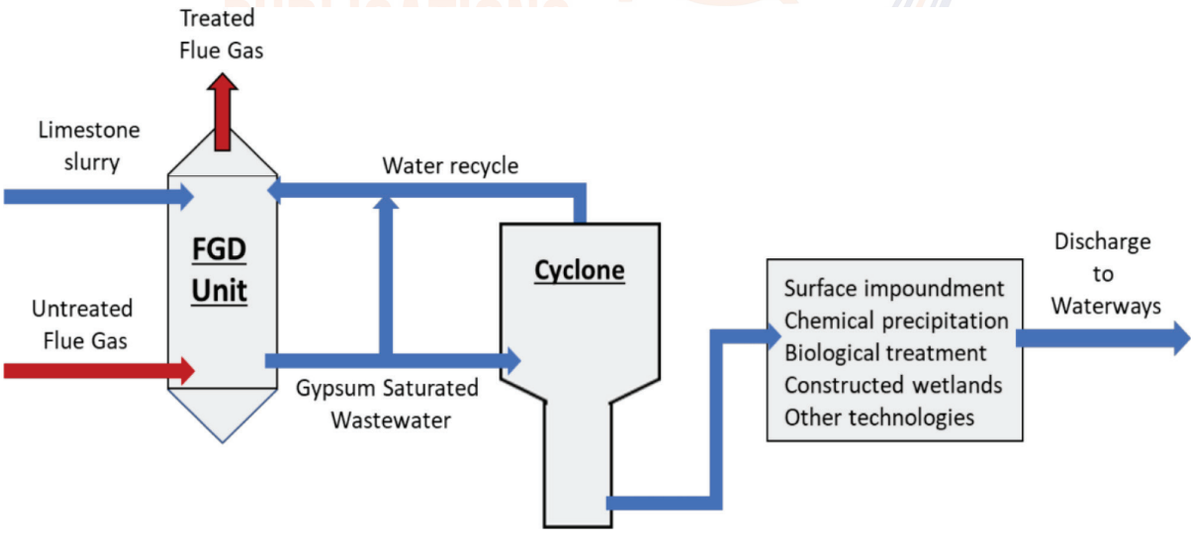
Flue Gas Desulphurisation (FGD)

Context

92% of India's 600 coal-based power units are yet to install FGDs.

About Flue Gas Desulphurisation (FGD)

- FGD refers to a set of technologies designed to remove sulfur dioxide (SO_2) from the exhaust flue gases of fossil-fuel power plants and other industrial processes.
- The primary goal is to reduce **SO_2 emissions,** which contribute to acid rain and respiratory problems.
- It uses various methods such as **Wet scrubbing, Dry Scrubbing** etc.
- **Advantages of FGD:**
  - It can remove up to 90% or more of SO_2 from flue gases.
  - The gypsum (byproduct) produced can be used in the construction industry, reducing waste.
  - It helps power plants meet stringent environmental regulations regarding SO_2 emissions.
- **Challenge**
  - FGD systems are **capital-intensive**, with significant **maintenance requirements.**
  - Wet FGD systems require excess water, which can be a concern in water-scarce regions.



Data Related to FGD Installation in Indian Thermal Power Plants (TPPs)

- **Total coal-based TPP units in India:** ~600 units
- **Units that have installed FGD systems:** Only **8%** (~48 units)
- **Units yet to install FGDs: 92%** (~552 units)
- **Category A Plants** (within 10 km of NCR or cities with 1 million+ population):
  - Total: **66 plants**
  - Installed FGD: Only **14 plants**
  - Compliance deadline: **By 2027**

First Polar Research Vehicle (PRV)

Context

India will design and build first-ever **indigenously** PRV by **Garden Reach Shipbuilders & Engineers (GRSE)** with **Norwegian collaboration**.

What is a Polar Research Vehicle (PRV)?

- A **Polar Research Vehicle (PRV)** is a specially designed ship built to carry out scientific research in extreme polar environments — both the **Arctic** and **Antarctic** regions.
- These ships are engineered to:
  - **Navigate through sea ice** and withstand harsh polar conditions.
  - Serve as a **mobile research platform** equipped with advanced laboratories and scientific instruments.
  - Enable **multi-disciplinary studies** like glaciology, oceanography, meteorology, marine biology, and climate science.

Significance of the New PRV for India

- Strengthens India's shipbuilding ecosystem and aligns with the **'Make in India'** and **Atmanirbhar Bharat** initiatives.
- A dedicated PRV allows India **self-reliant access** to these stations, reducing dependence on chartered foreign vessels.
- Polar regions are **climate-sensitive hotspots**. The PRV will help:
  - Monitor climate change impacts
  - Study polar biodiversity and marine ecosystems
  - Enhance oceanographic research and global climate models
- Positions India as a responsible global stakeholder in **Arctic and Antarctic governance**.
- Will catalyze investment, innovation, and employment in India's **maritime and shipbuilding sector** under **SAGAR (Security and Growth for All in the Region)** and **MAHASAGAR** (Mutual and Holistic Advancement for Security Across the Region).

Facts

- **Current Ships**: **MV Vasiliy Golovnin** (chartered from Russia for Antarctic missions).
- India operates **three research stations in Polar Regions**:
  - Bharati and Maitri in Antarctica
  - Himadri in the Arctic

Biobank to Preserve DNA of Species

Context

Delhi zoo to set up an on-site **wildlife biobank** to preserve **DNA of endangered species.**

What is DNA (Deoxyribonucleic Acid)?

- **Hereditary material** in almost all living organisms.
- It carries **genetic instructions** used in growth development, functioning, reproduction
- **Each cell in an organism has the same DNA.**
- It's what makes species and individuals genetically unique.

Why is DNA Important in Wildlife Conservation?

- Preserves Genetic Diversity
- Enables Scientific Research
- Supports Cloning and Assisted Reproduction
- Helps Track Illegal Wildlife Trade

About it

- **Setup by:** National Zoological Park (NZP), Delhi, in collaboration with the **Centre for Cellular and Molecular Biology (CCMB)**, Hyderabad and **Laboratory for the Conservation of Endangered Species (LaCONES)**.
- **Purpose:** Preserve genetic material (DNA, tissues, reproductive cells) from animals at the zoo.
  - Aid in **long-term conservation**, research, and **health interventions**.
  - Support **ex-situ conservation** efforts under Central Zoo Authority (CZA).
- **Part of: Consortium of Indian Zoos for Biobanking of Wildlife Genetic Resources**, initiated in 2019.

Facts

- **1st such biobank** was set up at **Padmaja Naidu Himalayan Zoological Park, Darjeeling**.
- **Endangered species at NZP** listed under Wildlife Protection Act, 1972 (Schedule I & II), including:
  - Asiatic Lion, Bengal Tiger, Indian Elephant, Indian Rhinoceros,
  - Indian Wolf, Indian Bison (Gaur), Dhole, Eld's Deer,
  - Himalayan Black Bear, Gharial, Marsh Crocodile,
  - Indian Rock Python, Spectacled Cobra, etc.

Australian Child born through Surrogacy got Exit Visa

Context

Exit visa was granted to a 6-year-old Australian child born through surrogacy in India in 2019 finally granted by intervention of **Delhi High Court** and coordination between the **Ministry of Health & Family Welfare (MoHFW)** and **Ministry of Home Affairs (MHA)**.

More in News

- Exit visa delayed due to confusion over whether the surrogacy was legal for **foreigners under new laws**.
- The court emphasized that laws **in force at the time of birth (2019)** should apply, not those enacted later (2022).

What is an Exit Visa?

- An **exit visa** is a formal permission granted to a **foreigner residing in a country without a valid visa** to leave that country.

- It is issued in exceptional situations, such as:
  - Overstay without valid immigration documents.
  - Foreign nationals (including OCI cardholders) who do not have valid entry stamps or legal entry documentation.

Types of Surrogacy

- **Altruistic Surrogacy (Allowed in India):** The surrogate mother **does not receive any monetary compensation**, except for **medical expenses and insurance coverage**.
  - Done **voluntarily**, often by a close relative or family member.
  - Aimed at **helping childless Indian couples**.
- **Commercial Surrogacy (Banned in India):** The surrogate mother is **financially compensated** beyond medical expenses.
  - Often exploited poor women, leading to **ethical and legal concerns**.
  - Was banned due to misuse and exploitation.

Surrogacy (Regulation) Act, 2021 – Key Provisions

- Surrogacy is when a woman carries and gives birth to a child for an **intending couple**, and **hands over** the child post-birth.
- **Regulation:**
  - **Commercial surrogacy is banned**.
  - **Altruistic surrogacy is permitted** under specific medical necessity.
  - Surrogacy is **not allowed** for purposes like **sale, prostitution**, or **exploitation**.
  - Only allowed for **medical indications** and **diseases specified** in regulations.
- **Eligibility Criteria:**
  - **For Surrogate Mother:**
    - Must be a **willing, married woman**, aged **25–35 years**.
    - Must have **at least one biological child** of her own.
    - Cannot act as a surrogate **more than once in her lifetime**.
    - Needs a certificate of **medical and psychological fitness**.
  - **For Intending Couple:** Must obtain:
    - A **Certificate of Essentiality** (medical justification).
    - A **Certificate of Eligibility** (age, marital status, childlessness).
    - Indian **widow or divorced woman** (35–45 years) is also allowed surrogacy if other conditions are met.
- **Rights of the Surrogate Child:**
  - Treated as the **biological child** of the intending couple.
  - Entitled to **all rights and privileges** available to a natural-born child.
- **Prohibition of Abortion:** Surrogate mothers **cannot be forced to abort** except under conditions **specified by law**.

Institutional Framework

- **National Assisted Reproductive Technology & Surrogacy Board (headed by Union Health Minister):**
  - Advises on policy.
  - Monitor implementation.
  - Sets standards for clinics.
  - Regulates infrastructure and manpower.
- **State ART and Surrogacy Boards:**
  - Established in each **State/UT with a legislature**.
  - Responsible for local oversight and regulation.

Surrogacy (Regulation) Rules, 2022

- In **March 2023**, an amendment **prohibited the use of donor gametes**, mandating both gametes (sperm and egg) to come from the **intending couple**.
- In **October 2023**, the **Supreme Court** in Arun Muthuvel vs. Union of India allowed surrogacy using a **donor egg** for a woman with **Mayer-Rokitansky-Kuster-Hauser (MRKH) Syndrome**, stating the restriction was prima facie contrary to the **objective of the Act**.

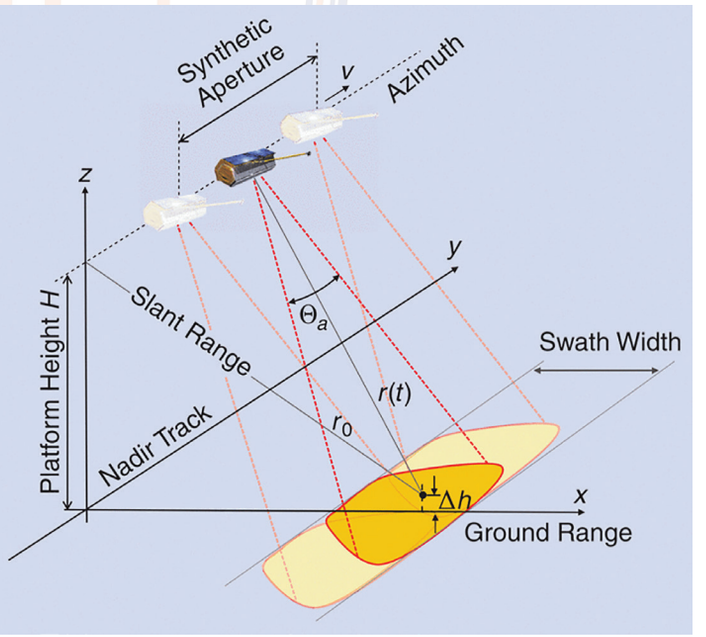
2024 Amendment to Surrogacy Rules

- The **2024 amendment** allowed **use of donor gametes** in surrogacy under medical necessity.
- The benefit is permitted only when the **District Medical Board certifies** that either partner suffers from a **medical condition** requiring use of a donor gamete.

What is synthetic aperture radar?

Context

Recently, NASA said the NASA-ISRO SAR mission had arrived at ISRO's spaceport in Sriharikota.



What is Synthetic Aperture Radar (SAR)?

- SAR is a type of **active remote sensing technology**.
- It sends out **microwave pulses** and records the energy that bounces back after hitting Earth's surface.

- Unlike optical sensors, SAR can **capture high-resolution images day or night**, and through **clouds, smoke, or light rain**.

How SAR Works

- A **microwave signal** is emitted toward the ground.
- The **reflected signals (echoes)** from surfaces like mountains, oceans, ice, or urban structures are recorded.
- A **moving antenna (on a satellite or aircraft)** captures these echoes from different positions.
- Using **advanced signal processing**, these signals are combined to **simulate a much larger antenna** (synthetic aperture).
- This technique allows **sharp imaging with high resolution**, without needing a physically huge antenna.

Advantages of SAR

- **All-weather, day-night capability** — unlike optical imaging, SAR works in **darkness and cloudy conditions**.
- Can image **wide areas** (hundreds of kilometers) in a single satellite pass.
- Works well for **monitoring terrain, agriculture, deforestation, flooding, and military surveillance**.

What SAR Can Detect

- **Soil moisture**, vegetation density, surface roughness.
- Differentiates materials like **water, soil, vegetation, metal, and concrete** based on their microwave reflectivity.
- Can detect **minute surface changes** that are invisible in optical imagery (e.g., after earthquakes or landslides)

CAR T-cell therapy

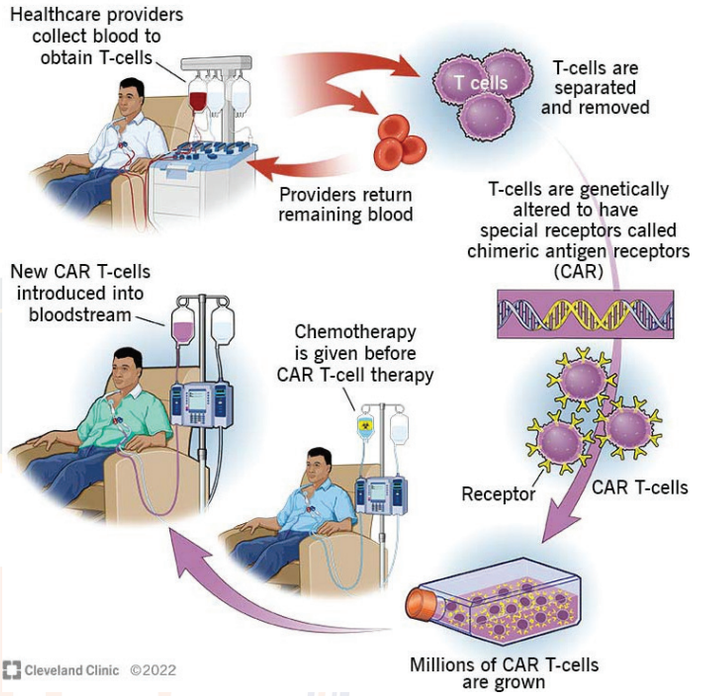
Context

Delhi's Dr (Col) VK Gupta beat his blood cancer after receiving CAR T-cell therapy at Tata Memorial Hospital.

About CAR T-cell Therapy

- CAR T-cell therapy is a **type of immunotherapy** used to treat certain types of cancer, such as **leukemia and lymphoma.**
- It involves **removing a patient's T cells (a type of immune cell)** and modifying them in a laboratory to produce special cells known as chimeric antigen receptor **(CAR) T cells.**
- The modified T cells are then **infused back into the patient's bloodstream,** where they can recognize and attack cancer cells that express specific targets, or antigens, on their surface.
- Because the CAR T cells are a **product of the patient's own immune system,** they are less likely to cause side effects compared to other forms of cancer therapy.
- **Global Status of CAR T Research on Solid Tumours:** Research on solid tumours like gliomas (brain/spinal cancers) and those targeting CLDN18.2 (gastric-related cancers) is at an advanced stage globally, with potential approvals expected in a few years.
  - **ImmunoACT**, a start-up incubated at **IIT Bombay**, is developing CAR T therapies for:
    - **Glioblastoma and neuroblastoma** (brain and nerve cell cancers)
    - **Gastric and gastroesophageal junction cancers** — similar to those targeted in leading Chinese trials.

How CAR T-cell therapy is used to treat cancer



What are T Cells?

- T cells, also known as **T lymphocytes,** are a type of **white blood cell** that play a central role in the **immune response.**
- **Significance:** T cells play a crucial role in the **adaptive immune response,** which is the part of the immune system that is capable of recognizing and responding to specific pathogens or abnormal cells.
- **Production:** T cells are produced in the **bone marrow** and mature in the **thymus gland.**
- **Important types of T cells:**

Helper T cells: These cells play a crucial role in coordinating the immune response.

Cytotoxic T cells: These cells play a key role in destroying cells that are infected with viruses or cancer cells.

T regulatory cells (Tregs): These cells play a crucial role in maintaining immune tolerance and preventing autoimmunity.

Astatine- 188

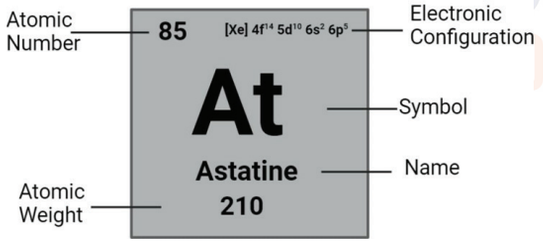
Context

University of Jyväskylä in Finland has recently detected and successfully measured the half-life of the heaviest known proton-emitting isotope of astatine, ^{188}**At**.

About Astatine

- **General Properties**
  - **Symbol & Atomic Number**: At, atomic number 85
  - **Category**: Halogen group (Group 17)
  - **Appearance**: Likely a dark-colored solid at room temperature and pressure
  - **Radioactivity**: Highly radioactive; emits a blue glow due to ionizing surrounding air
  - **Isotopes**: 41 known radioactive isotopes, ranging from mass numbers 188 and 190 to 229
- **Chemical & Physical Properties**
  - **Chemical Behavior**: Resembles iodine but exhibits more metallic characteristics
  - **Compounds**: Forms compounds similar to iodine but with more metallic properties
  - **Electronegativity**: Estimated to be between 2.2 and 2.5
  - **Density**: Estimated to be around 6.3 g/cm³
  - **Melting Point**: Estimated to be between 302°C and 337°C
  - **Boiling Point**: Estimated to be between 337°C and 352°C
- **Uses**
  - **Medical Applications**: Used in targeted alpha-particle **cancer therapy**
    - Astatine is released in the human thyroid; hence, it is used in the treatment of **thyroid diseases.**
  - **Research**: Studied for potential use in radiopharmaceuticals
  - **Industrial Applications**: Limited due to its rarity and radioactivity

Astatine (At) Element



Fact: The total amount of astatine in the Earth's crust at any time is less than 30 grams, with only a few micrograms ever artificially produced.

Permanent Magnet

Context

India's rare earth magnet imports surged amid China's export curbs, raising alarm for EV and auto sectors, prompting supply concerns, diplomatic action, and a push for self-reliance.

What are Permanent Magnets?

- Permanent magnets generate a magnetic field without any external power source.
- Once magnetized, they retain their magnetic strength for a long time.
- Typically made from metals like iron, nickel, cobalt, or rare earth elements such as neodymium and samarium.

FACT: India's first facility to produce rare earth permanent magnets is in **Visakhapatnam**.

What are Rare Earth Permanent Magnets?

- These are permanent magnets made using rare earth elements (17 elements in total).
- Key rare earth elements include neodymium, samarium, and dysprosium.
- They possess exceptionally strong magnetic properties.

Advantages over Ordinary Magnets

- Rare earth magnets produce much stronger magnetic fields than ordinary ferrous magnets.
- Enable compact, lightweight, and high-performance motors.
- Known for high magnetic field strength and large torque output.
- Widely used in electronics, automobiles, and military equipment.
- Crucial for advanced technologies like hypersonic weapons and directed energy systems.
- Helps tackle rising e-waste in India.

New 'weight-loss' drugs

Context

A U.S. study found that weight-loss drugs **semaglutide** and **tirzepatide** lead to **less weight loss in real life** than in clinical trials due to **patients stopping treatment early** or using **lower doses**.

About the Drugs (Semaglutide and Tirzepatide)

- **Type:** Injectable **GLP-1 receptor agonists**
- **Use:** Originally approved for **Type 2 diabetes** and now also for **obesity and weight management**
- **Examples:**
  - **Semaglutide** (brand name: Ozempic, Wegovy)
  - **Tirzepatide** (brand name: Mounjaro)
- **Mechanism:**
  - Mimic **GLP-1 hormone** to regulate blood sugar
  - **Suppress appetite** and **slow gastric emptying**, leading to **weight loss**
- **Effectiveness:** Showed significant weight loss in **clinical trials**
- **Real-life challenge:** Lower impact due to **non-compliance** and **dose reduction** by patients outside trial settings

Neutrino

Context

The **German KATRIN experiment** has set a new, more precise upper limit on neutrino mass — less than 0.8 electron

volts— advancing our understanding of the universe's most elusive particles.

About Neutrinos

- **Nature**: Neutrinos are nearly massless, electrically neutral subatomic particles that interact extremely weakly with matter.
- **Detection Difficulty**: Because they rarely interact with other particles, neutrinos are extremely hard to detect.
- **Discovery Timeline**:
  - First **predicted in 1930** by Wolfgang Pauli.
  - **Experimentally discovered in 1956**.
  - Initially thought to be **massless**, but later found to have a very small mass.
- **Particle Family**:
  - Neutrinos are part of the **lepton family** (which also includes electrons).
  - They are **not affected by the strong nuclear force**, unlike protons and neutrons.
  - They only interact via the **weak nuclear force** and gravity.
- **Origin**:
  - Neutrinos are created from the **decay of heavier particles** into lighter ones.
  - Common sources include the **sun, stars, supernovae, nuclear reactors, and radioactive decay**.
- **Abundance**:
  - Neutrinos are the **most abundant particles** in the universe.
  - Around **100 trillion neutrinos pass through the human body every second** without causing harm.
- **Scientific Importance**:
  - Crucial in the **Standard Model of particle physics**.
  - Play a vital role in **stellar processes**, the study of **black holes**, and in understanding the **Big Bang and cosmic evolution**.

What is KATRIN?

- **Full Form**: Karlsruhe Tritium Neutrino Experiment.
- **Location**: Karlsruhe, Germany.
- **Purpose**: To precisely measure the mass of the **electron antineutrino**, a type of neutrino.

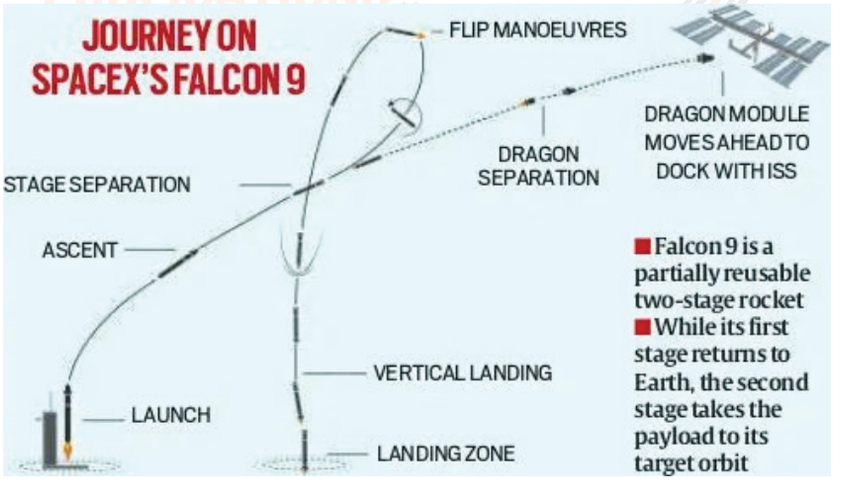
Recent Findings

- **New limit set:** Neutrino mass is now constrained to **< 0.8 eV** (electron volts).
- **Precision improved:** This is a **2× tighter constraint** than previous estimates.
- **Huge data used:** Based on analysis of **36 million electrons** from tritium decay.
- **Core method:** Measures electron energy in tritium beta decay to infer neutrino mass.
- **Massive setup:** The 200-tonne spectrometer took an **8,600 km journey** to Karlsruhe.
- **Scientific impact:** Helps in understanding **dark matter**, **cosmology**, and **Standard Model** physics.
- **Future goals:** To determine if neutrinos are **Majorana particles** (their own antiparticles).

How Astronaut Reach International space station

Context

The launch of the Axiom-4 Mission to the International Space Station (ISS) will be from the Kennedy Space Centre in Cape Canaveral, Florida.



How Astronaut Reach International Space Station

- **Pre-launch Preparation:** Astronauts undergo rigorous training and preparation.
  - Scientists select a precise time slot when the spacecraft trajectory aligns with the ISS orbit.
  - Astronauts board the **Crew Dragon spacecraft**, attached atop the **Falcon 9 rocket** at Kennedy Space Center, Florida.
- **Launch and Ascent:**
  - The Falcon 9 rocket lifts off vertically.

  - The **first stage** (booster) propels the spacecraft through Earth's dense atmosphere, powered by **9 Merlin engines**.
  - Around the edge of space (~80-100 km altitude), the first stage separates and returns to Earth for reuse.
  - The **second stage** (single Merlin engine) continues to propel the Dragon capsule into orbit.
- **Orbital Insertion:**
  - After reaching orbit, the Dragon spacecraft separates from the second stage.
  - The spacecraft initially enters an elliptical (oval) orbit slightly below the ISS orbit (~200-250 km altitude).
- **Rendezvous and Orbit Raising:** Over the next several hours, the Dragon performs **orbital raising maneuvers**.

Journey Duration

- **Crew Dragon**: Approximately **28 hours** (new spacecraft, extensive system checks).
- **Russian Soyuz spacecraft**: Can reach ISS in **8 hours** (optimized, well-tested maneuvers).

Approach and Docking:

  - As Dragon nears the ISS (within ~200 meters), it enters the "**keep-out sphere**", a safety zone around ISS.
  - **Autonomous Docking**: Dragon aligns itself using GPS, cameras, and laser-based **Lidar sensors**, enabling precise positioning.
  - The spacecraft gently moves toward the docking port on the ISS, matching speed precisely, effectively stationary relative to ISS.
- **Docking and Hatch Opening:**
  - After successful docking, the spacecraft is secured and undergoes thorough safety checks (~1-2 hours).
  - Once cleared, hatches between Dragon and ISS open, allowing astronauts to enter the space station.

Black Box in Aircraft

Context

The **black box of the crashed Air India flight AI171** was recovered from the roof of a hostel in Ahmedabad.

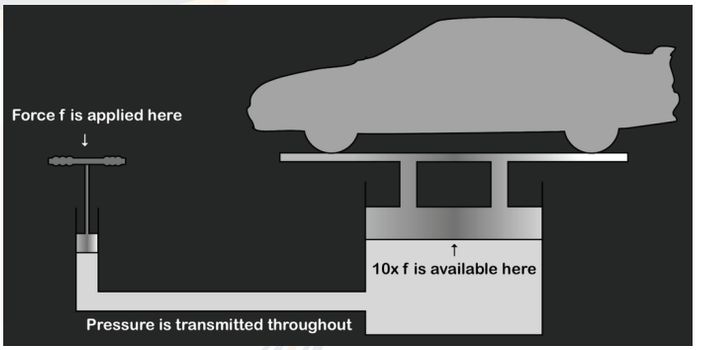
About Black Box

- A **black box** is a compact device that records critical flight data and cockpit audio during an aircraft's journey.
- Despite the name, it is usually **bright orange or yellow** to ensure easy visibility after a crash.
- It was **invented by Australian scientist David Warren** to help investigate the causes of airplane crashes.
- Commercial aircraft are generally required to have **two types of black boxes**:
  - **Cockpit Voice Recorder (CVR)** – captures cockpit conversations, radio communications, and ambient sounds.
  - **Flight Data Recorder (FDR)** – logs over **80 parameters** like altitude, airspeed, direction, engine status, and autopilot activity.
- These recorders are housed in **impact-resistant, fireproof, and waterproof** containers made of **titanium or steel**, with insulation to survive extreme conditions.
- Black boxes are usually placed near the **tail section** of the aircraft, where the chances of survival during a crash are highest

Hydraulic System

Context

Globally, the hydraulics industry is valued at approximately **$45–50 billion** and continues to experience steady growth.



About Hydraulics

- Hydraulics operate on **Pascal's Law**, formulated by French scientist **Blaise Pascal** in the 17th century.
- **Pascal's Law** states: When pressure is applied to an incompressible fluid, it is transmitted equally in all directions.
- **Working of a Hydraulic System:**
  - A **force is applied to a fluid**, generating pressure.
  - This pressure is **evenly distributed**, allowing a **small force over a small area** to produce a **larger force over a larger area**.
  - Example: A small force at one end can lift a heavy object at the other end by using a **larger surface area**.
  - Hydraulic systems are not limited to lifting — they perform **multiple mechanical functions** efficiently.
- **Key Components of a Hydraulic System:**
  - **Pump** – Creates the fluid flow.
  - **Pipes** – Carry the hydraulic fluid.
  - **Valves** – Control the direction and pressure of the fluid.

  - **Actuators** – Convert hydraulic energy into mechanical motion (linear or rotary).
  - **Tank with filters** – Stores and purifies the hydraulic fluid.
  - **Sensors or switches** – Monitor parameters like pressure, temperature, movement, and oil contamination.
- **Applications of Hydraulics:**
  - Broad sectors:
    - **Agriculture**: Harvesters, irrigation systems
    - **Construction**: Excavators, cranes
    - **Manufacturing**: Hydraulic presses, molding machines
    - **Wind Energy**: Turbine systems
    - **Waste Management**, **Automation**, etc.
  - Both **mobile equipment** (vehicles) and **static machinery**.
- **Advantages:**
  - **Smooth operation** and precise control.
  - **High power-to-weight ratio**, enabling powerful performance in compact designs.
  - **Better heat dissipation** than mechanical systems.
  - **High accuracy** and repeatability in complex tasks.

Vitiligo

Context

Vitiligo has gained attention for efforts to **raise awareness**, **dispel harmful myths**, and promote **inclusion and dignity** for those affected, ahead of World Vitiligo Day (June 25)

What is Vitiligo?

- A condition that causes **loss of skin color in patches**.
- Can affect any part of the body, including **hands, face, feet, forearms**, and **inside of the mouth**.
- May also affect **hair**, causing white or grey patches.
- Patches tend to **enlarge over time**.
- **Causes:**
  - Caused by the **destruction of melanocytes** (cells that produce melanin) by the immune system.
  - **Melanin** is the pigment that gives skin, hair, and eyes their color.
  - About **30% of cases are genetic**.
  - Exact cause remains under research.
- **Who is Affected?:**
  - Affects **all races and genders equally**.
  - More **visibly noticeable** in people with **darker skin tones**.
  - Affects around **1% of the global population**.
- **Nature of the Condition:**
  - **Not life-threatening**.
  - **Not contagious**.
  - Mostly a **cosmetic and psychological concern** due to social stigma.
- **Treatment:**
  - **No permanent cure**.
  - Treatment may help **restore skin color** in some cases.
  - Does **not stop progression** or prevent recurrence.

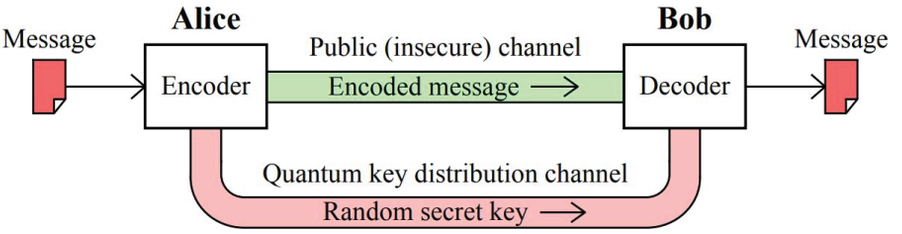
Quantum Communication

Context

DRDO and IIT-Delhi successfully demonstrated **quantum communication over 1 km in free space**, marking a major step toward secure, hack-proof defence communication in India.

About Quantum Communication

- It is a method of sending information using **tiny particles like photons** (light particles) in a **highly secure** way.
- It uses principles of **quantum physics**, especially **quantum entanglement**, to make communication channels **leak-proof**.



- Any **attempt to intercept** the communication instantly **alters the quantum state**, revealing the breach.
- This makes it ideal for use in **defence and critical infrastructure**.

- The key method used is **Quantum Key Distribution (QKD)** — a secure way to share encryption keys.
- **Quantum entanglement** means two particles are connected so that a change in one affects the other, even at a distance.

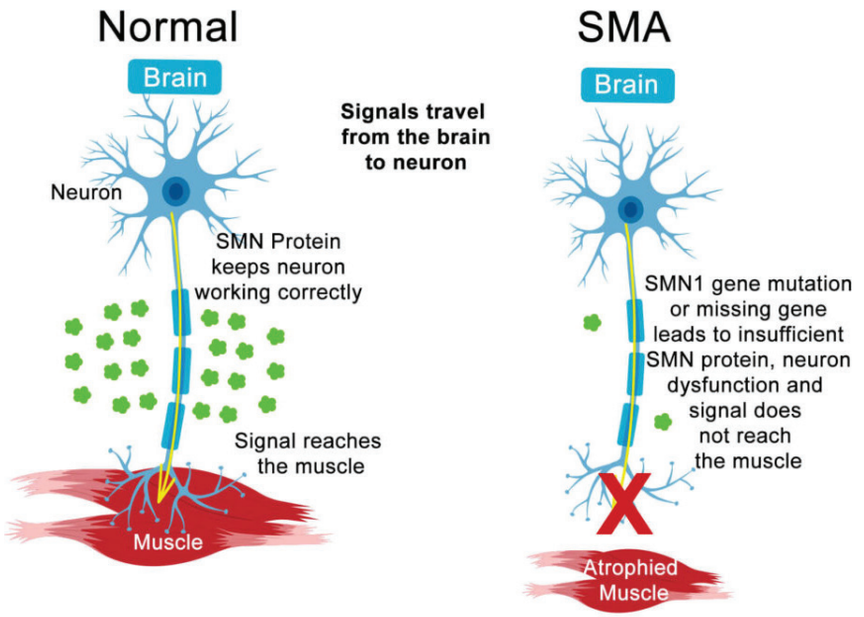
Applications of Quantum Communication

1. **Military and Government:** Enables **secure, spy-proof communication** of highly sensitive data.
2. **Banking Sector:** Uses QKD to **protect online banking** and **international financial transactions**.
3. **Power Grids:** Secures critical infrastructure from **cyber-attacks** that could disrupt electricity supply.
4. **Consumer Privacy:** Enhances protection of **personal data** during internet usage, including cloud storage and e-commerce.
5. **Scientific Collaboration:** Ensures **safe sharing of research** and proprietary data between institutions.
6. **Navigation (e.g., GPS):** Provides **tamper-proof, secure signals**, improving reliability and safety of navigation systems.

Spinal muscular atrophy

Context

Kerala's SAT Hospital gave India's first **presymptomatic SMA treatment** to a newborn identified through **prenatal screening**, using the rare drug **Risdiplam** to prevent future nerve damage.



About Spinal Muscular Atrophy (SMA)

- **Definition**: A serious genetic disorder that affects motor neurons, leading to progressive muscle weakness and loss of movement control.
- **Cause**:
  - Caused by mutations in the **SMN1 gene**.
  - This leads to a deficiency of **SMN protein**, essential for motor neuron survival.
- **Prevalence**:
  - Affects about **1 in 10,000 births**.
  - It is one of the **leading genetic causes of infant and child mortality**.
- **Types of SMA:**
  - **Type 0**: Most severe; symptoms begin before birth.
  - **Type 1**: Appears within the first 6 months of life.
  - **Type 2**: Onset between 6 and 18 months.
  - **Type 3**: Develops after 18 months into adolescence.
  - **Type 4**: Adult-onset, usually mild symptoms.
- **Symptoms:**
  - **Muscle weakness**, especially near the center of the body (proximal muscles).
  - May affect walking, sitting, or breathing in severe cases.
  - **Involuntary muscles** (heart, digestive system, blood vessels) are **not affected**.
  - Symptoms range from **mild to severely disabling**.
- **Treatment & Symptom Management: No cure** exists currently.
  - **Symptom management includes**:
    - **Physical therapy** – improves posture, mobility, and slows muscle weakening.
    - **Nutritional support**, **respiratory care**, and **assistive devices** may be used.
  - **FDA-approved therapies (2016–2020)**:
    - **Disease-modifying therapies** – slow disease progression.
    - **Gene replacement therapy** – targets the root genetic cause.

Rinderpest Virus

Context

India has achieved a major milestone in global animal health with the **ICAR-National Institute of High Security Animal Diseases (NIHSAD)** in **Bhopal** being designated as a **Category A Rinderpest Holding Facility (RHF)**.

About Rinderpest

- Also known as **cattle plague**, it is a **highly contagious viral disease** that affects **cloven-hoofed animals** like cattle and buffalo.
- Caused by a virus from the **Paramyxoviridae family**, genus **Morbillivirus**.
- While animals like **sheep and goats** may show mild symptoms, **cattle and buffalo** can suffer **up to 100% mortality** in highly susceptible herds.
- Other susceptible species include **zebus, eland, kudu, wildebeest, giraffes, antelopes, bushpigs, and warthogs**.
- **Transmission** occurs through direct contact; the virus is found in **nasal secretions** before symptoms appear, and later in most body fluids.
- **Symptoms in cattle** include:
  - High fever
  - Mouth lesions
  - Nasal and eye discharge
  - Severe diarrhoea and dehydration
  - Death usually within **10–15 days**
- Rinderpest **does not affect humans** and poses **no public health risk**.
- It historically occurred in **Europe, Africa, and Asia**, and was **officially eradicated in 2011**.

Rinderpest Holding Facility (RHF) Designation

- Given by the **World Organisation for Animal Health (WOAH)** and the **United Nations' FAO**.
- Aims to **prevent re-emergence** by limiting storage of **Rinderpest Virus-Containing Material (RVCM)** to a few **secure laboratories worldwide**.
- **ICAR-NIHSAD (Bhopal)** was designated India's official **RVCM repository** in **2012**.
- It is a **Biosafety Level-3 (BSL-3)** facility and a **WOAH reference lab** for avian influenza.
- After rigorous evaluation, it was awarded **Category A RHF status** for **one year**.
- India is now among **only six global facilities** entrusted to securely hold rinderpest virus material.

NB.1.8.1 variant

Context

WHO monitors **NB.1.8.1 (Nimbus)** for rapid spread and severe sore throat cases.

More in News

- No confirmed cases in India yet.
- Subvariant XFG (Stratus) is also emerging.

About NB.1.8.1 (Nimbus)

- **Variant Name:** NB.1.8.1 (Nimbus)
- **Lineage:** Omicron descendant
- **First Detected:** January 2025
- **Main Symptom:** Extremely painful sore throat ("razor blade throat")
- **Prevalence:** Made up 10.7% of global sequenced cases.
- **Symptoms (Omicron-like):** Cough, fever, fatigue, headache, congestion, muscle pain, nausea, loss of taste/smell, and in some—severe throat pain.
- **What Is "Razor Blade Throat"?**
  - Not a medical term—used to describe sharp, intense throat pain
  - Feels like swallowing glass shards
  - Seen in some viral and bacterial infections
- **Is Nimbus Dangerous?**
  - **WHO Risk:** Low
  - Mild to moderate illness
  - No major spike in hospitalizations or deaths
  - Vaccines still effective
- **Other Variant – XFG (Stratus):**
  - Fast-spreading Omicron subvariant
  - Not under WHO monitoring
  - Fewer cases than Nimbus

Extreme Helium (EHe) stars

Context

Researchers have discovered a rare cosmic phenomenon in **star A980, an Extreme Helium (EHe) star**, which contains an unusually **high amount of germanium**—a metallic element never seen before in such stars.

About Extreme Helium Star (EHe Star)

- **Definition:** A rare, low-mass supergiant star almost completely lacking hydrogen.
- **Composition:** Made primarily of helium (**unlike typical stars which are hydrogen-rich**).
- **Origin:** Believed to form from the merger of a **carbon-oxygen white dwarf** and a **less massive helium white dwarf**
- **Rarity:** Only **21 such stars** have been identified in our galaxy so far
- **Temperature Range:** Effective surface temperatures range between **8,000–35,000 K**
- **Discovery:** The first EHe star, **HD 124448**, was discovered in **1942** at **McDonald Observatory** by **Daniel M. Popper**

About Germanium

- **Element Name:** Germanium (Symbol: **Ge**, Atomic Number: **32**)
- **Group:** Lies in **Group 14 (IVa)** of the periodic table, between **silicon** and **tin**
- **Appearance:** Silvery-gray **metalloid**, with intermediate properties of metals and nonmetals
- **Structure:** Has a **diamond-like crystalline structure**, chemically similar to silicon
- **Stability:** Stable in air and water; unaffected by most acids and alkalis except **nitric acid**
- **China:** Produces around **60%** of the world's germanium
- **Others:** Canada, Finland, Russia, and the United States contribute the remaining production.

Critical and Emerging Technologies Index

Context

India ranks **10th** in the newly released **Critical and Emerging Technologies Index** by Harvard, showing it **lags behind** major powers like the U.S. and China.

What is the Critical and Emerging Technologies Index?

- A **global index** launched by **Harvard Kennedy School – Belfer Center**.
- It assesses **25 countries** on their performance in **five key technology sectors**:
  - **Artificial Intelligence (AI)** – 25%
  - **Biotechnology** – 20%
  - **Semiconductors** – 35%
  - **Space** – 15%
  - **Quantum Technology** – 5%
- **Purpose:** To help **policymakers understand** the **strengths and weaknesses** of nations in critical tech areas.
  - Combines **public and commercial data** to provide insights.
  - Measures **national power** using **six criteria**:
    - Research
    - Development
    - Talent
    - Commercial capacity
    - Geopolitical leverage
    - Dual-use potential (civil & military)
- **Top Performing Countries**
  - **United States**
  - **China**
  - **Europe** (as a bloc)
  - **Japan**
  - **South Korea**
  - **India's Position:** Ranks 10th.

SpaDex-2 mission

Context

ISRO is set to launch **SPADEX-2**, aiming to **dock two satellites in elliptical orbit**.

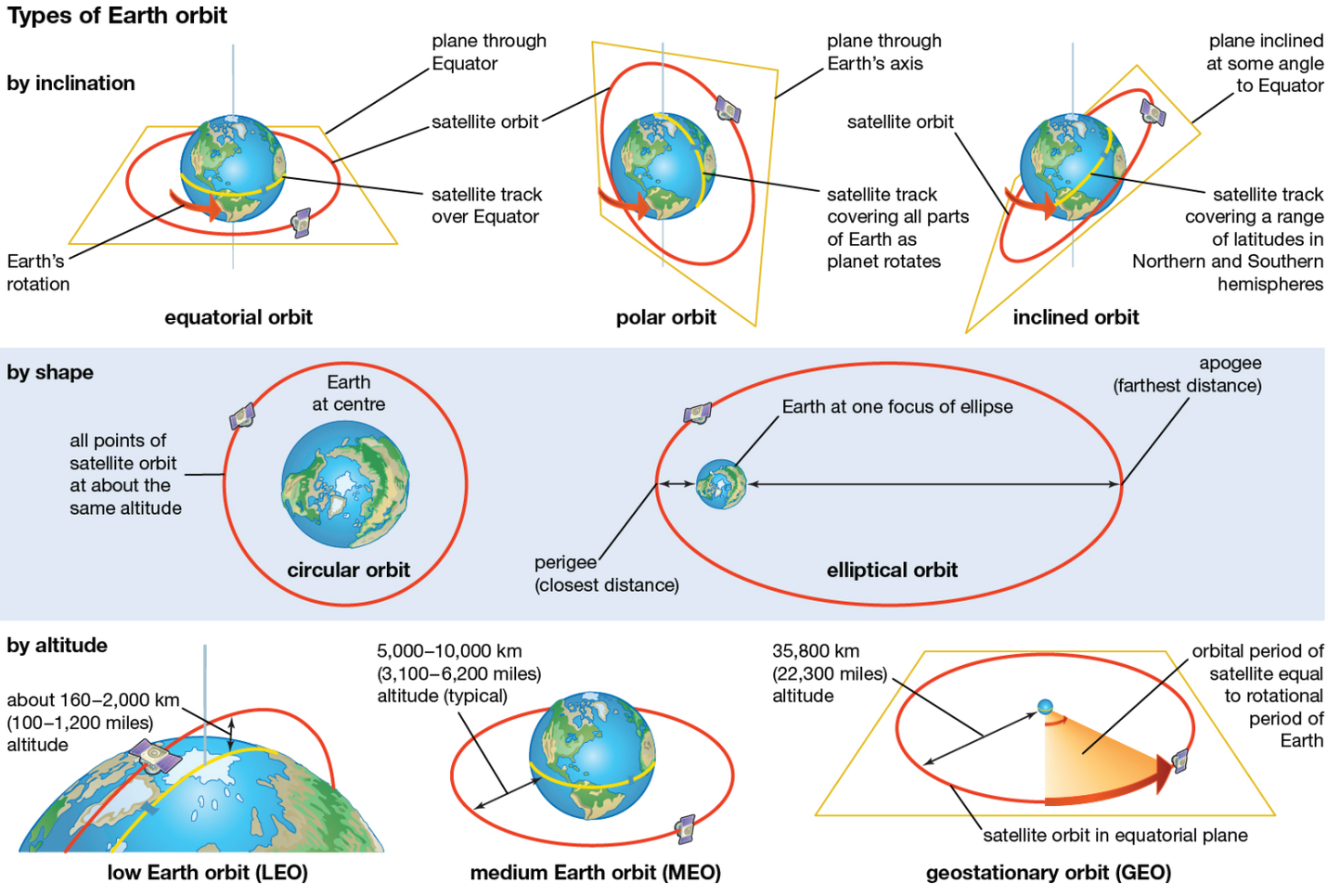
About SPADEX Mission

- **Full Form: SPADEX** stands for **Space Docking Experiment**.
- **Type:** A **cost-effective technology demonstrator mission**.
- **Objective:** To **develop and demonstrate** the technology for **Rendezvous**, **Docking**, and **Undocking** of **two small spacecraft** (**SDX01** – Chaser, **SDX02** – Target) in **low-Earth circular orbit**.
- **Launch by**: PSLV.
- **Importance:** In-space docking is a **critical capability** for:
  - **Human missions to the Moon**
  - **Lunar sample return missions**
  - **Construction and operation** of the **Bharatiya Antariksh Station (BAS)** (India's planned space station)
  - Enables **coordination of multiple rocket launches** for a single mission goal — essential for long-duration or modular space missions.
  - With this mission, **India aims to become the fourth country** in the world to demonstrate **space docking technology**, after the **USA, Russia, and China**.

About Elliptical Orbit

- **Definition:** An **elliptical orbit** is a type of **non-circular orbit** where the path of the satellite around a planet or object forms an **ellipse** (oval shape), not a perfect circle.
- **Shape & Geometry:**
  - Has two focal points (foci); the **central body (like Earth)** is located at **one focus**, not the center.
  - Defined by **eccentricity** (how stretched the orbit is); **eccentricity = 0** is circular, **0 < e < 1** is elliptical.

- **Key Parameters:**
  - **Perigee:** Closest point of the orbit to the Earth.
  - **Apogee:** Farthest point of the orbit from the Earth.
- **Speed Variation:**
  - The satellite **moves faster near perigee** and **slower near apogee** due to gravitational pull (Kepler's Second Law).
- **Uses of Elliptical Orbits:**
  - **Earth observation satellites** needing variable altitudes.
  - **Communications satellites** covering polar or high-latitude regions.
  - Missions requiring **longer dwell time** over a specific region.
  - Space experiments like **SPADEX-2**, which simulate conditions for future docking in more complex orbital paths.
- **Examples of Elliptical Orbits:**
  - **Molniya Orbit** – Used by Russia for high-latitude communications.
  - **GTO (Geostationary Transfer Orbit)** – Used as a transfer path before reaching circular geostationary orbit.



Newly Discovered Star-like Object: ASKAP J1832-0911

News? Astronomers have discovered a unique star-like object in the Milky Way, surprising scientists with its unusual radio and X-ray emissions.

What is ASKAP J1832-0911?

- A star-like object in the **Milky Way Galaxy**, about **15,000 light-years** away.
- Detected using the **Australian Square Kilometre Array Pathfinder (ASKAP)** and **NASA's Chandra X-ray Observatory**.
- Emits **radio waves and X-rays** every **44 minutes**, unlike known pulsars or magnetars.
  - Most known radio-emitting objects (like pulsars) blink at intervals of **milliseconds to seconds**, not minutes.
- Belongs to a new class called **"Long-Period Radio Transients"** (which emit intense radio waves over tens of minutes).

What are Pulsars?

They are **fast-spinning neutron stars** with **strong magnetic fields** that emit regular pulses of radiation, usually every few milliseconds to seconds, from their magnetic poles.

ELIZA

News? ELIZA was recently revisited for its historical significance amid current debates on AI and human-computer interaction.

What is ELIZA?

- It is **one of the first known chatbots**.
- Developed by **Joseph Weizenbaum** (also developed SLIP or "Symmetric Lisp Processor") at **MIT** between **1964 and 1966**.
- Simulated conversation using **pattern matching and substitution**, without real understanding.
- Its most famous script was called DOCTOR, which emulated a therapist.

Gene Variant to Delay Onset of Alzheimer

News? A **rare gene variant** that **delays the onset of Alzheimer's disease** has been identified, making headlines for its ability to **curb brain inflammation**—a key factor in neurodegenerative disorders.

About the Gene Variant – APOE3-R136S

- Offers **delayed onset** of **Alzheimer's disease**.
- Works by **reducing brain inflammation**, which is a key cause of neurodegeneration.
- Specifically **blocks the cGAS-STING pathway**, a part of the brain's **innate immune system** that can become overactive in diseases like Alzheimer's.

About Alzheimer's Disease

- A **progressive neurodegenerative disorder** affecting **memory, thinking, and reasoning**.
- It is the **most common cause of dementia**, responsible for **60–80% of all cases worldwide**.
- Leads to the **disruption of communication between brain cells**, resulting in a decline in **cognitive and daily functioning abilities**.

What is Early-Onset Alzheimer's Disease (EOAD)?

- Most Alzheimer's cases occur in people aged **65 or older**.
- However, **5–10% of cases occur earlier**, known as **Early-Onset Alzheimer's Disease**.
- EOAD typically:
  - Progresses **more rapidly**.
  - Affects individuals in their **prime working years**.
  - Has a **strong genetic link**.

HISTORY, ART & CULTURE

TOPICS FOR PRELIMS

Indus Valley Script

Context

ASI will host a global conference in August to discuss decoding the **Indus Valley script**.

About Indus Valley Script

- It is a collection of symbols created by the Indus Valley Civilization. It is one of the **oldest writing systems** in the Indian subcontinent. It is also known as **Harappan Script.**
- **Script: Boustrophedon,** it is written right to left in one line and then left to right in the next line.
- **Time period:** It was used from about 2,500 BC to about 1,900 BC.
- **Language:** It is unknown, and there are no known bilingual inscriptions to help decipher it.
- The script has been found on many objects, including pottery, seals, bronze and copper tables, bronze tools, bones, and clay tablets.
- **Symbols:** About 400 symbols are known.

Indus Valley Civilisation

- **Timeline:** Existed from **3300 to 1300 BCE**.
- It spanned over **800,000 sq km** across modern-day Pakistan and parts of northwestern India.
- It was discovered by **John Marshall in 1924.**
- **Major sites:** Harappa, Lothal, Dholavira, **Rakhigarhi (largest site in Indian Subcontinent)**, Kalibangan etc.

Major Challenges in Deciphering the Indus Script

- **Lack of Multilingual Inscriptions**
  - Multilingual inscriptions are necessary for decipherment as they enable comparisons with known scripts.
  - Despite robust trade links with Mesopotamia, **no multilingual inscriptions** from the Indus Valley have been found, unlike the Mesopotamian **cuneiform script**.
- **Unknown Script and Language**
  - According to **Andrew Robinson**, undeciphered scripts fall into three categories:
    - Unknown script writing a **known language**.
    - Known script writing in an unknown **language**.
    - **Unknown script writing an unknown language** (most challenging).
  - The **Indus script** falls in the third category, with no certainty about the language it represents, making phonetic interpretation difficult.
- **Limited Artefacts and Contextual Evidence**
  - Only **3,500 seals** have been identified, each with an average of **five characters**.
  - Insufficient material evidence makes analysis challenging compared.
  - Many Indus sites remain **undiscovered or underexplored**, limiting insights into the civilisation's context.
- **Limited Knowledge of the Civilisation**
  - Compared to Mesopotamia and Egypt, far less is known about the social, cultural and economic systems of the **Indus Valley Civilisation**.
  - Artefacts like the **Pashupati Seal** and seals with **unicorn motifs** provide clues but insufficient evidence.
- **Archaeological Gaps**
  - Many sites may still be buried or uninvestigated.
  - Greater **archaeological efforts** are needed to uncover material evidence for further research.

Pandya period

Context

An 800-year-old Shiva temple of the later Pandya period has been unearthed at Madurai district, Tamil Nadu.

Key Findings

- An old stone inscription from **1217–1218 CE** was found on a **Shiva temple** water channel (culvert).
- It dates back to the rule of **Maravarman Sundara Pandya**, a Pandya king.
- The temple was called **Thennavanisvaram**.
  - The word **"Thennavan"** was actually a **title used by Pandya kings**.
- The inscription shows that the temple managed its **own money** and provides useful information about **how people lived and worked** during that time.

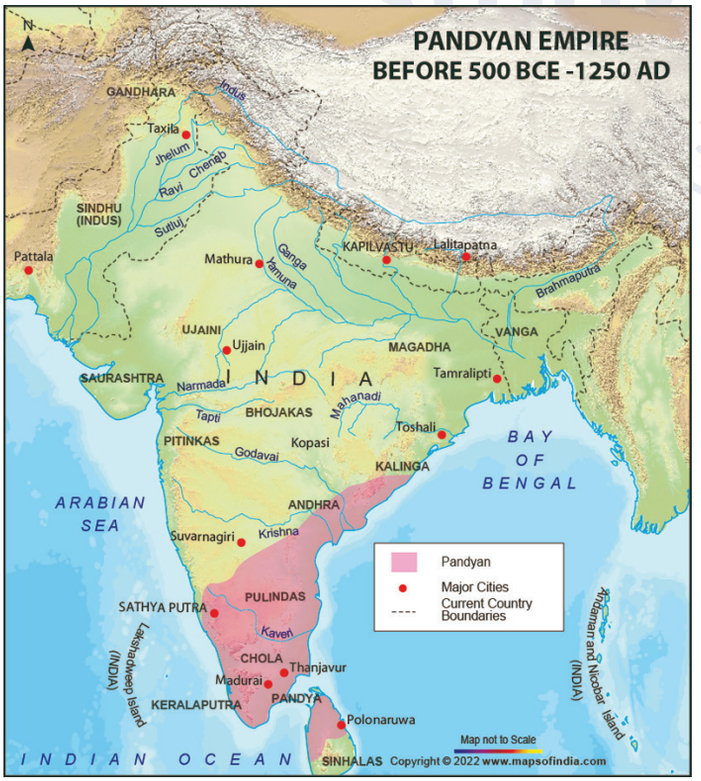
About Pandyan Dynasty

- **Early Pandyan Dynasty:** The Pandyas rose to power in **southern Tamil Nadu** around the **end of the 6th century CE**, following the decline of the **Kalabhras**.
  - Their early decline began when **Chola king Parantaka I** defeated **Pandya ruler Rajasimha II**.

- **Later Pandyan Dynasty:** After the fall of the Cholas, the **Pandyas re-emerged as the dominant Tamil power** in the **13th century CE**.
  - **Sadaiyavarman Sundarapandyan (1251–1268 CE)** was a notable ruler who extended his empire across Tamil Nadu and up to **Nellore in Andhra**.
  - He was succeeded by **Maravarman Kulasekharan**, who reigned for **40 years**.
  - The dynasty ultimately declined following the **invasion by Malik Kafur**, leading to internal divisions.

Pandya Administration

- The Pandya territory was called **Pandymandalam**, **Thenmandalam** or **Pandynadu**.
- The region was mostly rocky and hilly, except for fertile river valleys like **Vaigai** and **Tamiraparni**.
- **Madurai** was the preferred **capital** of the Pandya kings.
- The administrative divisions were: Pandymandalam → Valanadus → Nadus → Kurrams (group of villages).
- **Brahmin settlements**, known as **Mangalam** or **Chaturvedimangalam**, were created with irrigation facilities and given royal or divine names.
- **Key administrative titles:**
  - **Prime Minister:** Uttaramantri
  - **Royal Secretariat:** Eluttu Mandapam
  - **Military commanders:** Palli Velan, Parantakan Pallivelan, Maran Adittan, Tennavan Tamizhavel.
- **Major Port Town: Kayalpattinam** (in present-day Thoothukudi district).



Major Dynasties of Southern India

Dynasty	Capital	Emblem	Major Port
• Cholas	Uraiyur	Tiger	Puhar
• Chera	Vanji	Bow	Tondi, Muchiris
• Pandya	Madurai	Fish	Korkai

Servants of India Society

Context

The Gokhale Institute of Politics and Economics (GIPE) has officially called for the Servants of India Society to be placed under the control of a neutral administrator following allegations of financial mismanagement.

- **Gokhale Institute of Politics and Economics (GIPE)** was founded by SIS in **1930**, Pune.

About Servants of India Society (SIS)

- **Establishment: June 12, 1905** in **Pune**, India by **Gopal Krishna Gokhale** with **K. Devadhar**, **A.V. Patwardhan** and **N.A. Dravid**.
- **Objective:** To **train dedicated individuals** to serve the nation in a **religious and selfless spirit**.
  - To promote **political education** and **constitutional agitation** for India's national interest.
- **Branches**: Established in **Chennai (Madras)**, **Mumbai (Bombay)**, **Nagpur**, **Allahabad** etc.
- **Publications:** Started **"The Hitavada"**, an English-language journal, in **1911** from **Nagpur**.
- **Prominent Members:** S. Srinivas Shastri, Hriday Nath Kunzru, A.V. Thakkar, Mahatma Gandhi (joined under the guidance of Gopal Krishna Gokhale).

Ambubachi Mela

Context

Thousands of devotees have arrived in the Kamakhya Temple for the annual Ambubachi Mela.

About Ambubachi Mela

- It is an annual Hindu festival held at the Kamakhya Temple in Guwahati.
- The event takes place during the **monsoon season**, in the **Assamese month of Ahaar** (mid-June).
- The festival marks the **yearly menstruation cycle of Goddess Maa Kamakhya**.
- It is also referred to as **Ameti or the Tantric fertility festival**, owing to its deep links with the Tantric Shakti cult of eastern India.
- The mela is organized jointly by the Assam government and the Kamakhya Temple Management Committee.

About Kamakhya Temple

- **Located on: Nilachal hills** (also known as Kamagiri) in **Guwahati**.
- **Reconstructed:** In the **mid-16th century by the Koch dynasty** after being destroyed by Kala Pahar.
- **Features:** It is regarded as **one of the 52 Shakti Peethas.**
  - Important center for **Tantrik worship**, representing the **blending of Aryan and non-Aryan traditions**.

Poson Poya Festival

Context

Recently Sri Lanka celebrated the Poson Poya festival. It marked **2,000 years** since Buddhism was introduced to Sri Lanka.

About Poson Poya

- It is an Annual Buddhist festival observed on the full moon day of June.
- It commemorates the arrival of **Arahat Mahinda**, son of **Emperor Ashoka**, in the **3rd century BCE**.
- Arahat Mahinda preached Buddhism to **King Devanampiyatissa** at **Mihintale**.
- This event is considered a turning point in Sri Lankan history, leading to significant religious, cultural and social transformations.

Tabo Monastery

Context

Amid rising cloudbursts and flash floods in recent years, the monastery has urged the ASI to take urgent preventive measures to protect it from extreme weather damage.

About Tabo Monastery

- **Location**: Spiti Valley, Himachal Pradesh
- **Founded in**: 996 CE by Rinchen Zangpo, on behalf of Guge king Yeshe-O;
- **Significance**: One of the oldest monasteries.
- **Other Monastery in Himachal Pradesh:**
  - Shashur Monastery
  - Kye Gompa Monastery
  - Dhankar Monastery
  - Nako Monastery

PERSONALITY IN NEWS

Pandit Deendayal Upadhyaya

Context

Recently the Union Agriculture Minister addressed a symposium marking 60 years of Pandit Deendayal Upadhyaya's Integral Humanism.

About Pandit Deendayal Upadhyay

- **Birth:** 25 September 1916, Nagla Chandrabhan (now in Mathura district, Uttar Pradesh)
- He was **co-founder of Bharatiya Jana Sangh** (precursor to BJP).
- **Literary Works:**
  - **Rashtra Dharma:** Monthly magazine.
  - **Panchjanya:** Weekly newspaper.
  - **Swadesh:** Daily newspaper.
  - Authored a drama on Chandragupta Maurya and a biography of Adi Shankaracharya.

Integral Humanism

- He was best known for formulating the **philosophy of Integral Humanism (Ekatma Manavvad)**.
  - Humans are seen as a **four-dimensional being**: Body (Sharir), Mind (Manas), Intellect (Buddhi),and Soul (Atma).
  - True progress respects and nourishes **all these dimensions**, not just material needs.
- **Key Features of Integral humanism:**
  - **Cultural Nationalism** – Nation as a spiritual and cultural entity, not just territory.
  - **Antyodaya** – Upliftment of the poorest and the last person in society.
  - **Swadeshi & Decentralization** – Self-reliant, local economies rooted in Indian ethos.
  - **Harmony of Individual & Society** – Balancing rights and duties for collective welfare.
  - **Rejection of Capitalism & Socialism** – Both seen as materialistic and incompatible with Indian values.

National Schemes Named After Him

Scheme Name	Focus Area	Key Objective
Deen Dayal Upadhyaya Antyodaya Yojana (DAY-NULM & NRLM)	Urban & Rural Poverty Alleviation	Skill development and livelihood support for the poor
Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)	Rural Employment	Skill training for rural youth (15–35 years)
Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)	Rural Electrification	Continuous power supply and feeder separation
Deendayal Disabled Rehabilitation Scheme (DDRS)	Disability Welfare	Grants to NGOs for rehabilitation of persons with disabilities
Pandit Deendayal Upadhyaya Shramev Jayate Karyakram	Labor Reforms & Skill Development	Improving industrial environment and vocational training
Deendayal Upadhyaya Swaniyojan Yojana (DUSY)	Entrepreneurship	Promoting rural self-employment through training and support

Birsa Munda

Context

PM Narendra Modi paid tributes to revolutionary tribal icon Birsa Munda on his 125th death anniversary.

About Birsa Munda

- **Birth: November 15, 1875**, in **Khunti district, Jharkhand**, into the **Munda tribe** of the Chotanagpur Plateau.
- Grew up amid **colonial exploitation**, especially the imposition of the **zamindari system**, which replaced the traditional **Khuntkatti** land system, dispossessing tribal communities.
- **Role in the Freedom Struggle:**
  - He led the **Munda Rebellion** (1899–1900), also known as **'Ulgulan'** (The Great Tumult).
  - Rebellion was a response to **British land policies** and **Forest Laws** restricting tribal access to traditional resources.
  - Called for the establishment of **'Munda Raj'**, or self-rule, and launched **guerrilla attacks** against British forces.
- **Recognition:**
  - **November 15** is observed as **'Janjatiya Gaurav Diwas' (Tribal Pride Day)** across India.
  - Inspired the **PM-JANMAN (PM Janjati Adivasi Nyaya Maha Abhiyan)**, aimed at empowering and delivering justice to tribal communities.

Religious and Social Reform

- Initially educated at a **German Mission School** after converting to **Christianity**.
- Left the school after realising it was a tool for **religious conversion**.
- Founded a new faith called **'Birsait'**, encouraging return to **indigenous traditions**.
- Followers, known as **'Birsaits'**, resisted British rule and opposed feudal oppression.
- Earned the title **'Dharti Aba' (Father of the Earth)** for his spiritual leadership and advocacy for tribal identity.

Sant Kabirdas

Context

Sant Kabirdas Jayanti was celebrated on June 11, 2025, marking his 648th birth anniversary.

About Sant Kabir Das

- He was a **15th-century mystic poet**, **Bhakti saint** and **social reformer** from **Varanasi, Uttar Pradesh**.
- **Born in 1440**, believed to be raised by a **Muslim weaver family**.
- **Important works:**
  - Bijak, Sakhi Granth, Kabir Granthavali, Anurag Sagar.
  - Several verses included in the **Guru Granth Sahib**.

Kabir's Philosophy

- **Nirguna Bhakti**: Advocated devotion to a **formless, universal divine (Nirguna Brahman)**—not personal gods.
- **God within the self**: Emphasized **introspection over rituals**, saying God resides within, not in idols or temples.
- **Rejection of rituals**: Opposed **religious orthodoxy**, **superstitions** and **caste-based discrimination**.
- **Equality and non-violence**: Championed **social justice**, **non-violence (ahimsa)**, and **human dignity** for all.

Sree Narayan Guru

Context

The Prime Minister recently attended the **centenary celebration** of the **1925 meeting between Mahatma Gandhi and Sree Narayana Guru** at **Vigyan Bhawan, New Delhi.**

About Sree Narayana Guru (1856–1928)

- He was a Saint, philosopher, spiritual leader and social reformer from **Kerala**.
- **Belonged To**: **Ezhava** community – faced severe caste-based discrimination.

- **Reformer**: Led a **non-violent revolt** against the caste system; transformed Kerala society.
- **Philosophy**: Advocated **universal equality** – "**Oru Jathi, Oru Matham, Oru Daivam, Manushyanu" (One Caste, One Religion, One God for Mankind)**
- **Important Literary Works**: Advaitha Deepika, Atmavilasam, Daiva Dasakam, Brahmavidya Panchakam.
- **Key Movements & Institutions**
  - **Aruvippuram Movement (1888)**: Consecrated a **Shiva idol** Aruvippuram- challenging **Brahminical temple entry barriers**.
  - **Temple Building**: Established **40+ temples** across Kerala for lower castes to worship freely.
  - **Sivagiri Matha (1904)**: Founded an **ashram at Sivagiri hill**, near Varkala—now a spiritual and reformist centre.
  - **SNDP Yogam (1903)**: Founded the **Sree Narayana Dharma Paripalana Yogam** to uplift backward classes.
  - **Vaikom Satyagraha**: Participated in the anti-**untouchability protest** for temple access and equality.