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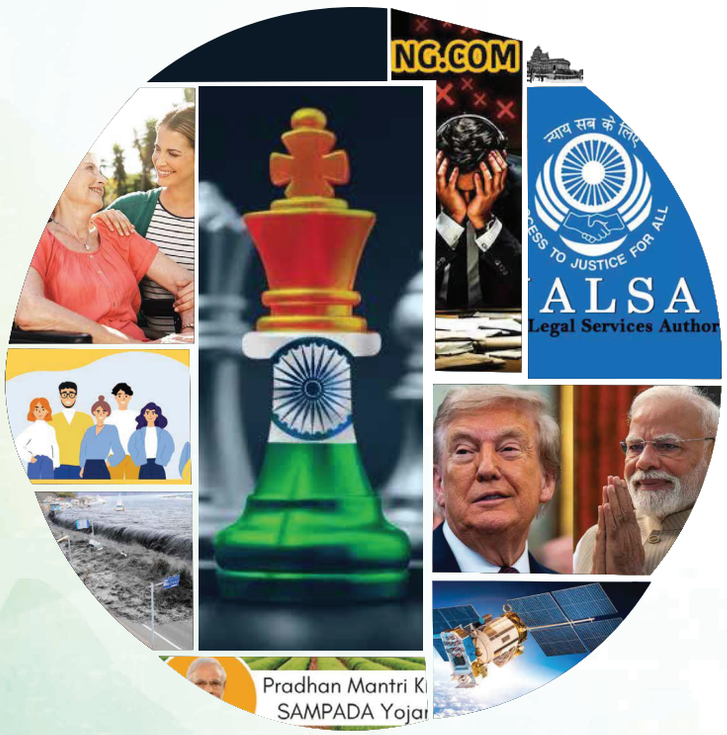

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- Comprehensive Coverage for Prelims + Mains Exam
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GEOGRAPHY, ENVIRONMENT & DISASTER MANAGEMENT

TOPICS FOR MAINS (GEOGRAPHY)

When the Ocean Strikes Back: On Tsunamis

Syllabus Mapping: GS Paper 1 & GS Paper 3, Important Geophysical Phenomenon, Disaster Management

Context

In August 2025, a powerful undersea earthquake off Russia's Kamchatka Peninsula triggered tsunami warnings across the Pacific.

About Tsunamis

- The seismic waves travelling through the ocean or seawater may result in high sea waves called tsunamis.
- Tsunami is a Japanese word: 'tsu' meaning harbor and 'nami' meaning wave.
- **Characteristics:**
  - Wavelength: up to **200 km**.
  - Speed: **700–900 km/h** in deep ocean.
  - Height: Small in deep water but rises dramatically on approaching shallow coasts (shoaling effect).
  - Can cross entire ocean basins with little loss of energy.

Causes of tsunamis

- **Submarine Earthquakes:** These typically occur at **convergent plate boundaries**, where one tectonic plate is forced beneath another in a process called **subduction**.
  - The sudden vertical displacement of the seabed displaces enormous volumes of water, generating waves that can travel across entire ocean basins.
  - E.g., **2004 Indian Ocean tsunami**, triggered by a massive **magnitude 9.1 earthquake near Sumatra**, which caused widespread devastation in more than a dozen countries.
- **Volcanic Eruptions:** Explosive volcanic activity can also generate tsunamis, especially when a volcano collapses into the sea or displaces water through violent eruptions.
  - E.g., **1883 Krakatoa eruption** in Indonesia, which produced towering waves
- **Landslides and Submarine Slumps:** Sudden landslides, either from mountains collapsing into the sea or from unstable underwater slopes (submarine slumps), can displace huge amounts of water almost instantaneously.
  - E.g., the **1958 Lituya Bay tsunami in Alaska**, where a massive rockfall triggered waves estimated to be over 500 meters high, the tallest ever recorded.
- **Meteorite Impacts:** Though exceedingly rare, large meteorites striking an ocean can displace massive volumes of water, resulting in **mega-tsunamis**

Impact of Tsunamis

- **Destruction of infrastructure:** Tsunamis have the potential to cause significant damage to coastal cities and towns.
  - E.g, the Great East Japan Earthquake in 2011 triggered a massive tsunami that devastated coastal areas, causing widespread destruction and loss of life.
- **Loss of life**: Tsunamis can result in the loss of thousands of lives.
  - E.g., in 2004, the Indian Ocean tsunami claimed the lives of over 230,000 people across 14 countries, making it one of the deadliest natural disasters in history.
- **Environmental impact:** The force of the waves can cause erosion, leading to the destruction of coastal habitats such as coral reefs and mangroves.
  - The influx of saltwater into freshwater ecosystems can also contaminate drinking water sources and harm aquatic
  - E.g., the 2011 tsunami in Japan caused a nuclear accident at the Fukushima Daiichi power plant, leading to radioactive contamination of the surrounding environment.

- **Economic consequences**: The destruction of infrastructure, loss of businesses, and disruption of supply chains can result in billions of dollars in damages.
  - E.g., the 2004 Indian Ocean tsunami caused an estimated $10 billion in damages to infrastructure and property.

India's Tsunami Vulnerability

- The east and west coasts of India and the island regions are likely to be affected by Tsunamis generated mainly by subduction zone related earthquakes from the two potential source regions:
  - The Andaman-Nicobar-Sumatra Island Arc and
  - The Makran subduction zone north of Arabian Sea.

Initiatives for Tsunami Mitigation

- **Global Tsunami Warning System:** It is a comprehensive international network designed to detect, assess, and provide timely warnings for tsunamis.
  - It was established by the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO).
- **Indian Tsunami Early Warning Centre (ITEWC):** The Government of India has put in place an Early Warning System for mitigation of tsunami under the control of Indian National Centre for Ocean Information Services (INCOIS), Hyderabad. It has the responsibility to provide tsunami advisories to Indian Mainland and the Island regions
- **Tsunami-Ready programme**: It is a community performance-based programme initiated by the UNESCO-IOC.
  - It seeks to promote tsunami preparedness through active collaboration of public, community leaders, and national and local emergency management agencies.
  - Two villages of Odisha- Venkatraipur in Ganjam district and Noliasahi in Jagatsinghpur district are 'Tsunami Ready'.
- **Indian Ocean-wide tsunami exercises (IOWave Exercises:)** These are effective tools for evaluating the readiness of the end-to-end Indian Ocean Tsunami Warning and Mitigations System (IOTWMS) and for identifying changes that can improve its effectiveness.
- **Broadcasting Service:** INCOIS has partnered with ISRO and Airports Authority of India (AAI) to develop a satellite-based message broadcasting service through the indigenous navigational satellite communication system NAVIC.

National Disaster Management Guidelines for the Management of Tsunamis (2010)

The 2004 tsunami prompted NDMA to formulate Tsunami Risk Management Guidelines to outline inter-agency roles and responsibilities, tsunami risk preparedness, mitigation and response.

- **Tsunami Risk Evaluation and Vulnerability Assessment:** The NDMA recommends conducting evaluations to assess vulnerability and creating risk maps for areas prone to tsunamis.
  - The **Indian Naval Hydrographic Department** (INHD), operating under the Chief Hydrographer to the Government of India, regularly furnishes bathymetry data to authorized entities for generating inundation maps.
- **Tsunami Readiness:** The NDMA suggests the coastal regions should have "Tsunami Escape" directional signboards. Further, both visual and radio media should take an active role in alerting and warning the public.
- **Structural Mitigation Measures:** The NDMA recommends structural measures such as constructing storm shelters, breakwaters, seawalls, underwater sand dykes, bio-shields, and restoring natural buffers like mangroves, coral reefs, and sand dunes to protect coastal regions.
  - It also emphasizes community safety infrastructure, including tsunami shelters, retrofitting vulnerable buildings, and setting up regional knowledge centres to provide disaster education and emergency communication.
- **Robust Techno-Legal Regime:** The guidelines also suggest the establishment of a robust techno-legal framework by promoting effective land use practices to ensure compliance of tsunami-safe zoning, planning, design and construction practices.
- **Community Involvement in Emergency Response:** The NDMA recommends initiating various public awareness campaigns. Self-Help Groups (SHGs), Non-Governmental Organizations (NGOs), and Community-Based Organizations (CBOs) can be trained to participate in search and rescue operations.

Challenges in Tsunami Risk Management

- **Scale and Complexity**: Unlike other natural hazards, the mitigation of hazards created by tsunami is difficult, mainly because losses are on a much larger scale.

- **Insufficient Documentation and Paleo-Tsunami Studies**: One significant challenge in managing tsunami risks lies in the inadequate documentation and study of historical tsunami events and paleo-tsunamis.
- **Limitations Due to Lack of High-Resolution Near-Shore Data**: Lack of high resolution near-shore bathymetric and topographic data is a limiting factor for inundation models necessary for tsunami risk assessment and mitigation.
- **Inadequate Tsunami Risk Perception:** low risk perception and a dearth of collective memories, tsunami risk communication is difficult and complicated.
- **People's Participation Deficiency in Coastal Disaster Readiness:** Insufficient understanding of evacuation procedures, warning signs, and safe zones can lead to delayed or improper responses during an actual tsunami event.

Measures to Strengthen Tsunami Risk Management

- **Strategic land-use planning:**For example, the Oregon State in the USA has prepared comprehensive guidelines for land use planning to mitigate the loss of life and infrastructure due to tsunami inundation.
- **Multi-risk framework:** Strategic decision-making for coastal communities needs to consider the possible interactions and cascading effects between different hazards (e.g., storm surges, tsunamis, coastal erosion, earthquakes, landslides, etc.) and their consequences.
- **Physical Preventive Measures:** Such measures could be nature-based (e.g., tsunami control forests like mangroves, actions for coastline ecosystem protection) and engineering-based (e.g., breakwaters, seawalls, tsunami building codes etc.).
- **Capacity Building**: Preparedness for tsunamis requires the collective action of communities, schools, governments, academics, and private sectors.

Best Practice-Japan

Japan uses multiple layers of tsunami preparedness, including the YureKuru Call app, which issues nationwide earthquake and tsunami alerts within three minutes, and automated drones in Sendai City that broadcast evacuation messages during emergencies. Additionally, Fudai Village's 51-foot floodgates and seawall stand as a model of resilient coastal infrastructure

How Global Warming is affecting India's Monsoon Patterns

Syllabus Mapping: GS Paper 1 & GS Paper 3, Important Geophysical Phenomenon, Climate Change

Context

Global warming is making India's southwest monsoon increasingly unpredictable by weakening traditional circulation patterns and fueling extreme weather with excess atmospheric moisture.

India's Southwest Monsoon

- It refers to the seasonal reversal of winds bringing moist air from the Indian Ocean to the Indian subcontinent, causing 75% of India's annual rainfall.
- **Causes:**
  - **Differential heating**: Land heats faster than the ocean → creates low pressure over the Indian subcontinent, drawing in moist oceanic air.
  - **ITCZ shift**: Inter-Tropical Convergence Zone (ITCZ) moves northwards over India during summer, aiding monsoon onset.
  - **Tropical Easterly Jet**: Helps in transporting moisture into the subcontinent.
  - **Orography**: Western Ghats, Himalayas block moist winds, leading to heavy rainfall on windward sides.
- **Significance:**
  - **Agriculture**: Supports ~50% of India's net sown area and ~40% of food production.
  - **Water Resources**: Recharges groundwater, rivers, reservoirs.
  - **Economy**: Impacts food security, inflation, energy (hydropower), and rural livelihoods

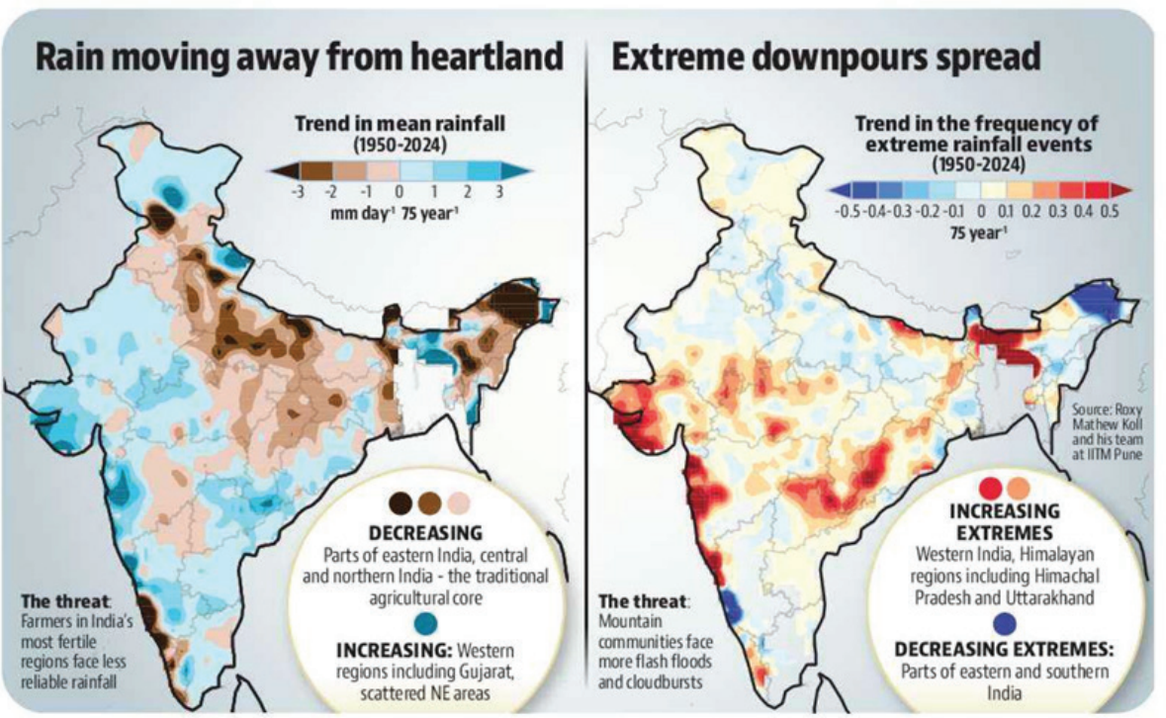
Causes/Drivers of Monsoon Changes

- **Weakened monsoon circulation:** Rising sea levels and rising temperatures have disrupted the pressure gradients that traditionally drive monsoon winds.
- **Warming and moisture paradox**: Increased atmospheric temperatures allow air to hold 7% more moisture per °C, leading to heavy rain bursts separated by longer dry spells.
- **Ocean–atmosphere dynamics**: Enhanced ocean warming promotes upward moist air movement over the equatorial ocean, triggering dry descending air (subsidence) over land and inhibiting rainfall.
- **Tropical Easterly Jet weakening**: The weakening of this jet has contributed to reduced rainfall in central and certain parts of northern India.

- **Regional warming effects**: Warming in the Middle East and Arabian Sea has intensified pressure gradients, drawing more moisture toward west and northwest India.
- **Climate change–driven variability**: Climate models predict a surge in extreme rainfall and delayed/unpredictable monsoon onset and progression.
- **Anthropogenic Causes:**
  - **Greenhouse Gas Emissions (Global Warming):** Rising CO_2 and other GHGs → increase surface air temperature → Warmer air holds more moisture, causing **intense downpours** and **longer dry spells**.
  - **Aerosols & pollution** → reduce sunlight (dimming), alter cloud formation.
  - **Deforestation & land use change** → less evapotranspiration, disturbed local rain cycles.
  - **Climate Change–Induced Ocean Alterations:** Anthropogenic warming has **raised Indian Ocean temperatures**, shifting circulation patterns (Indian Ocean Dipole) → Weakens **Tropical Easterly Jet** and monsoon circulation.

Impacts

- **Geographic shift in monsoon rains:**
  - **Rain moving away from heartland:** Decrease in rainfall over eastern, central, northern India (traditional agricultural core). Increase in western regions like Gujarat and scattered northeast areas.
  - **Extreme downpours spread:** Increase in western India and the Himalayan regions (Himachal Pradesh, Uttarakhand); decrease in parts of eastern and southern India.
- **Intensifying humid heat:** Alternating dry and wet spells with high moisture during dry phases increase heat stress on populations.
- **Monsoon-linked public health risks**: Conditions of >27°C temperature, moderate rain, and 60-78% humidity elevate dengue risk.
- **Record monsoon extremes (2025)**: North India experienced its wettest monsoon in 12 years-21% above normal-with record "extremely heavy" rainfall events.
- **Glacial and Himalayan risks**: Accelerated glacier melt raises flood and landslide risk; monsoon flooding already caused mass casualties.
- **Urban flooding & infrastructure stress**: Mumbai's August 2025 rains nearly doubled average monthly totals.



Changes in the Himalayan Ecosystem due to Climate Change

- **Weather Pattern Shift:** Western Disturbances now occur in **non-traditional months**, colliding with the Southwest Monsoon, leading to **intense cloudbursts and heavy rainfall**.
  - **Eg:** IMD recorded **14 WDs during the 2025 monsoon**, unusually high for the season.

- **Glacial Retreat: Himalayan glaciers are melting at double the global average**; 2023 ICIMOD report said **75% of glaciers could vanish by 2100** under current warming.
  - **Result:** swelling of glacial lakes and more frequent **Glacial Lake Outburst Floods (GLOFs)** (e.g., **Sikkim's South Lhonak GLOF, Oct 2023**).
- **Landslides & Rockfalls:** Continuous rock reworking + extreme rainfall destabilizes slopes.
  - **Eg: Himachal Pradesh 2023 monsoon** saw >150 landslides, killing ~400 people.
- **Hydrological Extremes:** Changing river regimes: More sudden floods (e.g., **Chamoli disaster 2021**, triggered by rock-ice avalanche + glacial melt).
- **Biodiversity & Livelihood Impacts:** Alpine flora shifting upward; altered habitats for species like snow leopard and Himalayan monal.
  - **Eg:** Medicinal plants like **Kutki and Jatamansi are shrinking** in range.

Challenges Ahead

- **Forecasting weakening:** The weakening traditional links, such as El Niño-monsoon coupling, hinder seasonal prediction.
- **Cloudburst monitoring gaps**: Extremely sudden, localized cloudbursts (>100 mm/hour) are increasingly deadly but poorly monitored.
- **Infrastructure & civic preparedness**: Cities struggle to handle flash floods-Hyderabad's drainage was overwhelmed, despite 155 weather stations and response planning.
- **Health & migration**: Climate-linked health burdens (like dengue) and displacement risks rise amid changing monsoon regimes.

Way Forward / Strategic Measures

- **Better monitoring & forecasting:** Closing gaps in cloudburst detection and seasonal forecasting systems.
  - **Scientific innovations:** AI + satellite data for nowcasting; Doppler radars expansion.
- **Public health adaptation**: Plan for dengue risk based on temperature and humidity trends.
- **Early warning systems & localized planning**: Urgent need for granular, tehsil-level monsoon action plans based on regional variability.
- **Urban resilience**: Implement climate-resilient infrastructure: lakes/ponds, clear drains, green spaces; seen as critical after Delhi floods.
- **Resilient agriculture:** Drought-resistant & flood-tolerant varieties (e.g., Submergence-tolerant rice "Swarna-Sub1").
- **Mitigation-greenhouse gas reductions**: Long-term adaptation must be coupled with aggressive GHG reduction-emissions control remains vital.
- **Policy initiatives**: Strengthen climate-resilient agriculture, urban planning, and disaster management under NAPCC and Panchamrit commitments.
- **Community awareness & public health outreach**: Educate vulnerable communities about heat, health risks (like dengue), and emergency protocols.

Ecological Succession in a Changing Climate

Syllabus Mapping: GS Paper 3, Climate Change

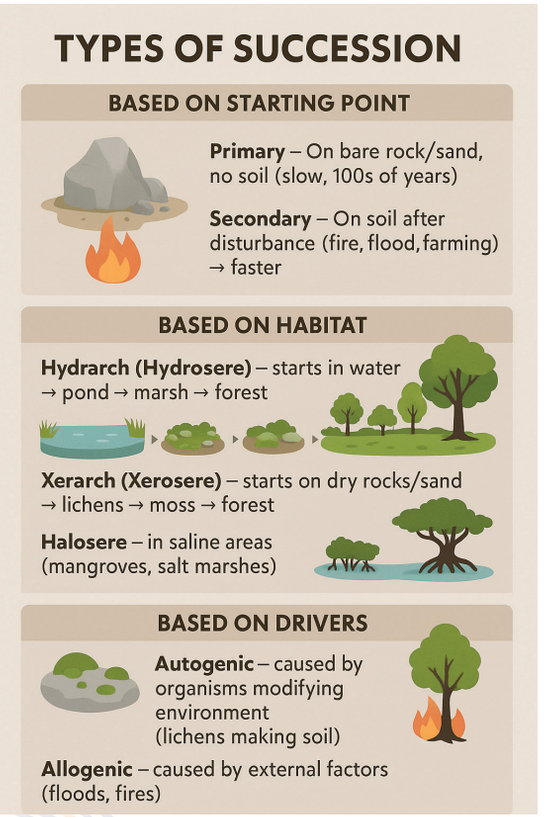
Context

Climate change is increasingly disrupting natural patterns of ecological succession in India's fragile ecosystems, demanding restoration strategies that build resilience against rising temperatures, altered rainfall, and invasive species.

What is Ecological Succession?

- Ecological succession is the **gradual and natural transformation of ecosystems** over time, through predictable changes in species composition and community structure.
- **Process:**
  - Begins with **pioneer species** (lichens, mosses) colonising barren areas.
  - Proceeds through **intermediate (seral) stages**, with increasing complexity.
  - Ends with a **climax community** — stable, self-sustaining ecosystems dominated by long-lived species.
- **Significance:** Provides resilience to ecosystems, enabling recovery after **natural disasters (floods, volcanic eruptions)** and **human disturbances (logging, deforestation).**
- **Stages of Succession:**

- **Nudation** – Bare area formed (lava, flood, glacier).
- **Pioneer Stage** – Hardy species (lichens, mosses, grasses) arrive first.
- **Seral Stages** – Shrubs, small trees, larger trees gradually establish.
- **Climax Community** – Stable, self-sustaining ecosystem (e.g., forest, mangrove).



How Climate Change is Disrupting Succession

- **Frequent Disturbances:** Repeated fires, floods, and storms "reset" succession, preventing ecosystems from reaching climax stages.
- **Phenological Shifts:** Flowering and pollination timings no longer align, weakening regeneration.
- **Soil and Water Stress:** Altered rainfall, salinity, and temperature hinder native species' survival.
- **Invasive Species:** Disturbed habitats are colonised by hardy invasives (**Lantana camara, Acacia spp., Pteridium aquilinum**), which block natural regeneration.
- **Impact:** Loss of biodiversity, carbon storage, and ecosystem resilience.

Impact on India's major Biogeographic Zones

Ecological Succession in the Himalayas

- **Treeline shifts:** Due to rising temperatures, the upper boundary where trees can grow (treeline) is moving higher up the mountains.
- **Decline of oaks:** Banj oak (**Quercus leucotrichophora**), a late-successional and stable forest species, is struggling to regenerate because of human pressures (grazing, logging) and frequent fires.
- **Pine expansion:** Instead of oaks, early-stage species like chir pine and grasses, which tolerate stress, are spreading.
- **Species migration:** High-altitude species like **Abies spectabilis** (East Himalayan fir), **Rhododendron campanulatum**, and **Betula utilis** (Himalayan birch) are shifting further upslope.
- **Impact:**
  - Hardwoods (oak, birch) that support rich biodiversity are declining.
  - Loss of habitat for many birds and mammals.
  - Changes in migration and feeding patterns of Himalayan fauna.

Ecological Succession in the Sundarbans

- **Salinity stress:** Sea-level rise and reduced rainfall are making soils more saline.
- **Normal succession:** Salt-tolerant pioneers (**Avicennia officinalis**) usually pave the way for less salt-tolerant climax mangroves like **Heritiera fomes** (sundari).
- **Disruption now:** High salinity favors pioneers, but sundari trees are declining.
- **Impact:**
  - Mangrove forests lose resilience against cyclones.
  - Biomass and carbon storage decrease.
  - Fish, prawns, and crabs that depend on diverse mangroves lose breeding grounds.

Ecological Succession in the Western Ghats

- **Fire frequency rising:** Fires used to maintain balance between grasslands and forests. But now, repeated fires prevent forests from maturing.
- **Blocked regeneration:** Seedlings of late-successional hardwood trees die in every fire, so climax forests cannot form.
- **Invasive takeover:** Disturbed landscapes are quickly colonised by invasive species like **Lantana camara**, **Acacia** (wattle), and **Pteridium aquilinum** (fern).
- **Impact:**
  - Native forests are replaced by invasive-dominated scrublands.
  - Less food for wild herbivores like elephants and gaur.

  - Soil fertility and water-holding capacity decline.
  - Long-term ecosystem degradation.

Way Forward: Tackling Climate-Driven Disruptions in Ecological Succession

- **Succession-Informed Restoration:** Restore ecosystems along natural successional pathways, not by planting fast-growing monocultures.
  - Use native, climate-tolerant species suited to local conditions and seral stages.
- **Promote Passive Recovery:** Allow ecosystems to regenerate naturally where possible. Use active restoration only in severely degraded or high-risk sites.
- **Manage Invasive Species and Disturbances:** Control invasives like **Lantana** and **Acacia** through fire and grazing management. Prevent repeated resets of ecosystems to early stages.
- **Climate-Resilient Planning:** Anticipate treeline shifts, salinity rise, and rainfall changes. Use assisted migration for vulnerable climax species (e.g., Himalayan oak, Sundarbans' sundari).
- **Phenology-Aligned Actions:** Time restoration with local flowering, pollination, and seed dispersal cycles to avoid mismatches.
- **Landscape and Watershed Approaches:** Restore forests, wetlands, rivers, and grasslands in an integrated way to maintain soil, water, and connectivity.
- **Monitoring and Early Warning:** Use satellites, drones, and AI to track succession stages, invasive spread, and treeline shifts for adaptive management.
- **Community-Based Conservation:** Empower local and tribal communities to manage fires, grazing, and invasives.
  - Link livelihoods with conservation (eco-tourism, mangrove fisheries, agroforestry).
- **Policy Reorientation:** Shift from carbon-focused afforestation to ecosystem-centric restoration. Integrate ecological succession into forest, coastal, and biodiversity policies.

Ecological succession is the **engine of ecosystem development and resilience**, yet climate change and human disturbances are **derailing natural pathways** in fragile regions. India's conservation strategies must therefore **move beyond tree planting** to **ecologically informed restoration** that respects native species, natural stages of succession, and local contexts.

TOPICS FOR PRELIMS (GEOGRAPHY)

Nickel–Copper–Platinum Group Elements (Ni-Cu-PGE) Sulphide

Context

A major potential Ni–Cu–PGE mineral zone has been discovered in Chhattisgarh's Mahasamund district, marking a breakthrough in India's search for strategic minerals.

About Ni–Cu–PGE Sulphide

- Refers to **Nickel, Copper, and Platinum Group Elements (Pt, Pd, Rh, Ru, Ir, Os)** occurring together in **sulphide-rich mafic–ultramafic rocks**.
- Typically formed through **magmatic segregation** processes.
- Globally found in **Russia (Norilsk), South Africa (Bushveld), Canada (Sudbury Basin)**.

Key Applications

- **Nickel (Ni):**
  - Lithium-ion and solid-state EV batteries
  - Stainless steel & superalloys for aerospace
  - Coins and electroplating
- **Copper (Cu):**
  - Electric wiring, electronics, renewable energy systems
  - Key material for power grids & EV charging infrastructure
- **Platinum Group Elements (PGEs):**
  - **Platinum & Palladium:** Catalytic converters for vehicles
  - **Rhodium:** Reduces vehicular NOx emissions
  - **PGEs in general:** Fuel cells, green hydrogen, medical devices, jewellery

Strategic Importance

- Classified as **critical minerals** by India, US, EU, Japan.
- Essential for **energy transition, clean mobility, and defence tech**.
- PGEs are indispensable for **hydrogen economy** and **net-zero targets**.

National Relevance

- India is **heavily import-dependent** for Ni, Cu, and PGEs.
- Discovery aligns with:
  - **India's Critical Minerals Strategy (2023)**
  - **National Electric Mobility Mission**
  - **Renewable Energy & Net-Zero 2070 commitments**
- Supports **Atmanirbhar Bharat** in critical mineral supply chains.

New Type of Supernova

Context

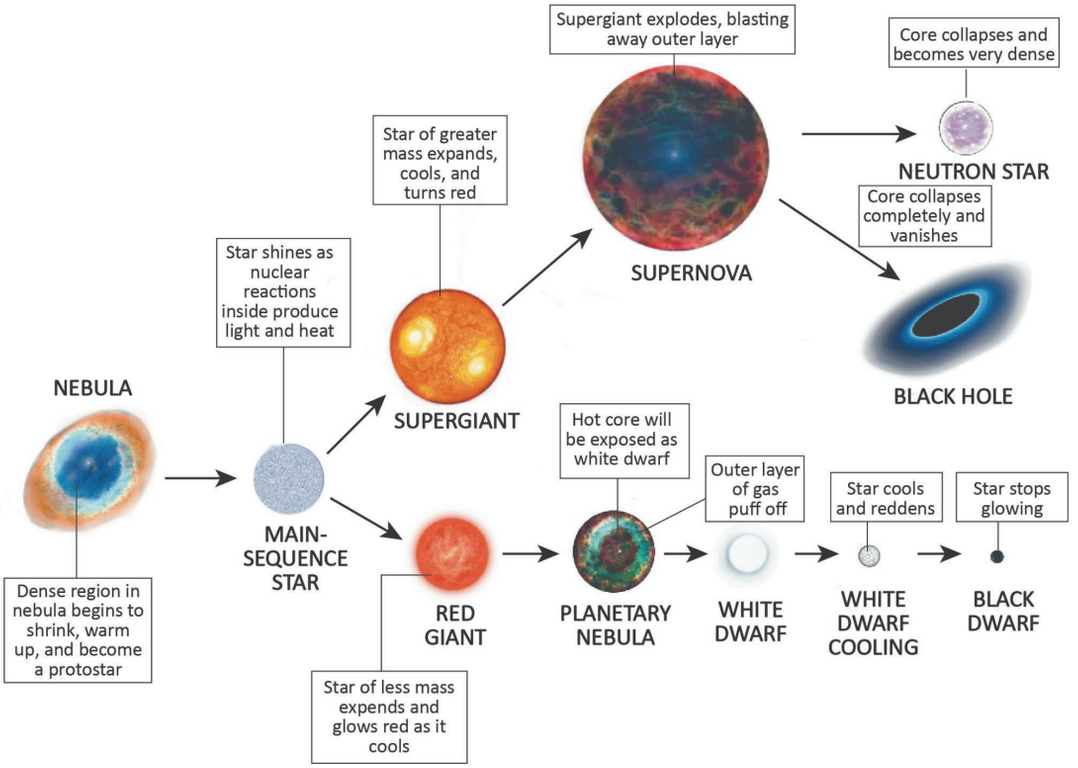
Astronomers (The Astrophysical Journal) have reported the discovery of a new type of supernova, which occurs when a black hole wins a gravitational tug-of-war against a giant star—a process never observed before.

About Supernovae

- It is a cataclysmic explosion marking the death of certain stars.
- In a few seconds, it releases more energy than the Sun will in its **10-billion-year lifetime**.
- They can outshine an entire galaxy for days to weeks.
- These are factories of **heavy elements (Fe, Au, U, etc.)** that enrich interstellar space, enabling the formation of **new stars, planets, and life**.

Traditional Types of Supernova

- **Type I Supernova:** Triggered when a white dwarf in a binary system accretes matter beyond the Chandrasekhar limit (1.4 solar masses), causing a thermonuclear runaway explosion.
- **Type II Supernova:** Occurs when a massive star (≥8 solar masses) exhausts its nuclear fuel and its core collapses under gravity, leaving behind a neutron star or black hole.



The Newly Discovered Type

- The newly discovered type occurs when a **black hole or neutron star companion** strips away the outer layers of a giant star. The collapse is **accelerated** by this extreme gravitational pull.
- Instead of exploding symmetrically, the star is **torn apart**, leading to a **violent asymmetric blast**.
- Importance: Explains **mysterious, irregular stellar deaths** observed in deep space.

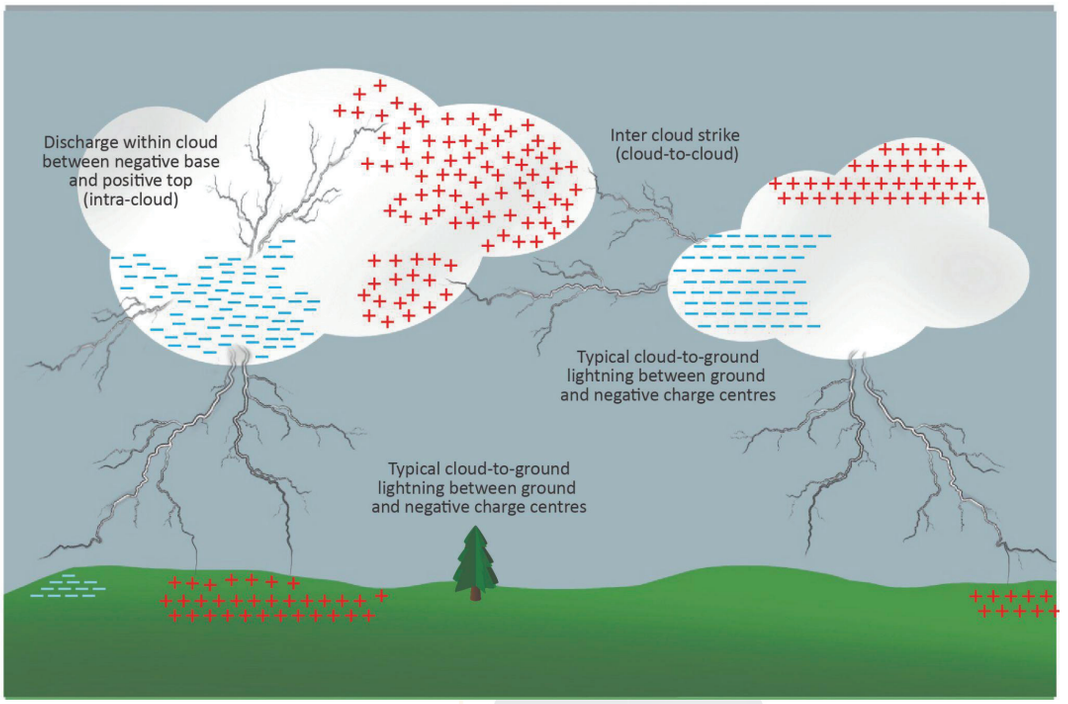
WMO certifies 'megaflash' lightning world record

Context

The World Meteorological Organization has established a new world record for the longest lightning flash – 829km in a "notorious storm hotspot" in the US.

About Lightning

- Lightning is a giant electric spark produced when the build-up of opposite charges between clouds or between cloud and ground becomes very high.
- The accumulated charge overcomes the insulating capacity of air, resulting in a sudden discharge known as lightning.
- There are two ways that flashes can strike ground: naturally downward (those that occur because of normal electrification in the environment), and artificially initiated or triggered upward.
- **Upward Lightning** occurs when a self-initiated lightning streak develops from a tall object that travels upward toward an overlaying electrified storm cloud.
- **Difference between Upward and Downward Lightning:** Upward lightning usually has a lower intensity and shorter duration than downward lightning. It occurs more frequently during thunderstorms.



- **Causes**
  - **Rising Temperatures:** A 1°C rise can increase lightning events in India by 7-18%.
  - **Pollution:** Higher aerosol concentration aids cloud electrification.
  - **Urbanisation & Land-use Change:** Alter local convection and moisture, intensifying lightning frequency.
- **Trends in India:** India has witnessed a 57% increase in lightning incidents (2019–2024) as per IMD and CROPC.
- **Key Hazards**
- **Infrastructure Risks:** Electric fires, explosions, and short circuits.
- **Environmental Damage:** Trees burst due to rapid moisture evaporation.
- **Human Impact:** Significant loss of life, especially among farmers and outdoor workers.
- **Measures Taken by India**
  - **NDMA:** Adopted a **two-pronged strategy**—scientific solutions with community outreach, and climate action for long-term reduction.
    - Issued **Guidelines (2019)** for Prevention and Management of Lightning and Thunderstorms.
  - **Early Warning & Awareness:**
    - Protocols for lightning alerts, **SACHET app** for dissemination.
    - **IMD Forecasts:** Provide 5-day outlooks, 24-hour warnings, and real-time **nowcasts**.
    - **Damini app:** Public lightning location alert system.
  - **Technological Support:**
    - Three Lightning Detection Networks established.
    - Expansion of Doppler Weather Radars (DWRs) to improve real-time monitoring.

Rare Earth Magnets

Context

Automakers are also scaling back on some non-essential vehicle components in order to minimize the use of rare earth magnets.

About Rare Earth Magnets

- Permanent magnets made from alloys of rare earth elements.
- Extremely strong magnetic force, high energy density, superior performance in compact sizes.
- China dominates with nearly **90% of processing capacity**.
- **Types:**
  - **Neodymium (Nd-Fe-B):** Made of neodymium, iron, and boron; very powerful.
  - **Samarium Cobalt (SmCo):** Made of samarium and cobalt; strong and heat-resistant.
- **Applications:**
  - **Medical:** MRI machines, X-ray devices, PET imaging.
  - **Technology & Electronics:** Smartphones, hard drives, consumer electronics, jewelry.
  - **Industry & Defense:** Aviation, national defense, renewable energy equipment.
  - **Automobiles:** Widely used in **electric vehicles (EVs)** for motors and components.

TOPICS FOR PRELIMS (ENVIRONMENT)

Himalayan clouds carrying toxic metals pose health risks

Context

A new study by the Bose Institute, Kolkata (under the Department of Science and Technology) challenges the widely held belief that mountain rain is "clean" and free from pollutants.

Key Takeaways from the Report

- **Presence of Toxic Metals**: Low-level clouds over India were found to contain heavy toxic metals.
- **Detected Contaminants**: Cadmium (Cd), copper (Cu), zinc (Zn), and chromium (Cr) were observed in non-precipitating clouds across the Western Ghats and the Eastern Himalayas.
- **Regional Variation**: The Eastern Himalayas showed 1.5 times more pollution, with a 40–60% higher concentration of toxic metals compared to the Western Ghats.
- **Health Concerns**:
  - Children face nearly 30% higher risk than adults due to greater vulnerability to toxins.
  - Dissolved chromium compounds raise the probability of carcinogenic diseases.
- **Major Sources**:
  - Vehicular emissions from foothill areas.
  - Industrial discharge and pollution from adjoining lowland regions.

About Heavy Metals and Pollution

- **Defining Features**: Heavy metals (HMs) are elements with high atomic weights (63.5 to 200.6) and density above 4000 kg/m³. Common examples include zinc, copper, cadmium, cobalt, arsenic, lead, and chromium.
- **Toxicity**: Of the 50+ heavy metals present in the periodic table, around 17 are considered extremely toxic to humans and ecosystems.
- **Natural Occurrence**: These elements have existed naturally in the Earth's crust since its formation.
- **Human-Induced Pollution**:
  - Industrial processes such as smelting, mining, and metal foundries.
  - Leaching of metals into soil and water bodies.
  - Vehicular and industrial emissions.

Supreme Court Sounds Alarm on Himachal Crisis

Context

Raising concerns about the ecological imbalance in the State of Himachal Pradesh, the Supreme Court warned that if unregulated development continues, "the entire State may vanish in thin air from the map of the country."

Key Issues Identified

- **Infrastructure Growth**: Expansion of four-lane highways and private facilities—mainly for connectivity and tourism (religious and natural)—on fragile slopes has triggered instability.
- **Hydropower Projects**: Excessive damming and construction have severely impacted aquatic ecosystems. **Example: River Sutlej has shrunk drastically to a narrow stream.**
- **Soil and Disaster Vulnerability**: Large-scale, unchecked activities have weakened soil structures, increasing landslide and flood risks. **Incidents: Kullu (2025), Mandi (2025), Shimla (2023).**
- **Glacier Retreat**: The Bara Shigri glacier in Lahaul-Spiti has receded by 2–2.5 km, reflecting the scale of climate stress.
- **Legislative Gaps**: Local municipal laws on waste collection remain misaligned with the **Solid Waste Management Rules, 2016**.
- **Administrative Weakness**: Removal of forest guard posts has fueled illegal tree felling and weakened enforcement.

Suggested Measures

- **Monitoring and Accountability**: Ensure transparent use of **green tax** funds, preventing diversion to unrelated activities.
- **Curbing Illegal Activities**: Tackle unregulated mining and quarrying by offering alternative livelihoods and enforcing environmental norms.
- **Inclusion of Expert Opinion**: Geologists, environmental scientists, and local communities should be consulted before sanctioning projects.
- **Sustainable Waste Management**: Promote segregation at source, decentralised processing, and community-driven awareness initiatives.

Environmental Compensation On Polluting Entities

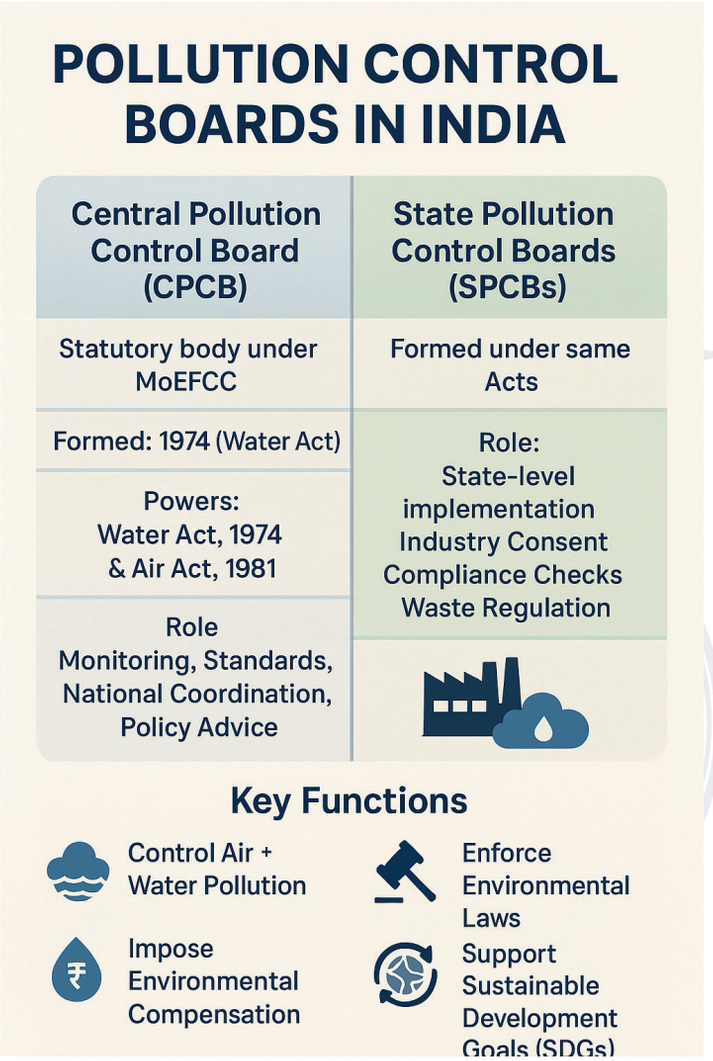
Context

The Supreme Court, in the case Delhi Pollution Control Committee (DPCC) v. Lodhi Property Co. Ltd., overturned a Delhi High Court ruling which had earlier held that only courts could levy Environmental Compensation (EC).

Key Takeaways from the Judgment

- **Statutory Powers of PCBs**: Pollution Control Boards (PCBs) are empowered to impose environmental compensation under:
  - **Section 33A, Water (Prevention and Control of Pollution) Act, 1974**
  - **Section 31A, Air (Prevention and Control of Pollution) Act, 1981**
- **Polluter Pays Principle**:
  - PCBs cannot penalise every violation under the Acts.

  - Penalties can only be imposed where actual environmental harm has occurred.
  - **Indian Council for Enviro-Legal Action v. UoI**: SC held that the **polluter is responsible for repairing environmental damage**.
- **Discretionary Action**: Boards can decide whether to:
  - Impose a penalty,
  - Direct immediate restoration of environmental harm, or
  - Apply both measures simultaneously.
- **Expanded Liability**: In **Vellore Citizens' Welfare Forum v. UoI (1996)**, SC clarified that liability includes both **compensatory** and **remedial** aspects.
- **Preventive Measures**: Regulators can also take **proactive or ex-ante steps** to safeguard the environment.



EC vs Damages vs Fines

Aspect	Environmental Compensation (EC)	Environmental Damages	Environmental Fines/Penalties
Basis	**Polluter Pays Principle** – recovery of costs to restore environment	Civil liability – awarded by courts for harm caused	Statutory contravention of laws (e.g., Water Act, Air Act)
Authority	Imposed by Pollution Control Boards (PCBs) under Water & Air Acts	Ordered by Courts/Tribunals (e.g., NGT, SC)	Levied by courts/regulators as punishment
Objective	Restoration and remediation of environmental damage	Compensation to affected parties + environmental restitution	Deterrence and punishment for violation of law
Nature	Compensatory & remedial (restores ecological balance)	Compensatory (monetary damages, liability for harm)	Penal (focus on deterrence, not restoration)
Example	DPCC imposing EC on construction firms for dust pollution	Bhopal Gas Tragedy civil damages	Fine imposed under Environment (Protection) Act for illegal emissions

Environment Protection (Management of Contaminated Sites) Rules, 2025

Context

The Ministry of Environment, Forest and Climate Change (MoEFCC) has notified the Environment Protection (Management of Contaminated Sites) Rules, 2025 under the Environment Protection Act (EPA), 1986.

Key Provisions

- **Definition of Contaminated Sites:** Sites polluted due to historical hazardous waste dumping, leading to soil, groundwater, or surface water contamination.
  - Examples: old landfills, chemical waste dumps, and spill sites.
- **Identification and Reporting:** District Administration to submit **half-yearly reports** on suspected sites to the State Pollution Control Board (SPCB) or designated authority.
  - SPCBs/expert bodies to carry out a **preliminary assessment within 90 days**, followed by a **detailed investigation in the next 90 days**.
  - If hazardous chemicals (from the list of **189 under Hazardous Waste Rules, 2016**) exceed safe limits, the site is formally declared "contaminated."
  - Names and details of such sites must be **publicly notified**; restrictions placed on access.
- **Remediation Planning:** A designated **reference organisation (expert body)** will prepare a site-specific remediation plan.
- **Liability and Cost Recovery:**
  - **Polluter Pays Principle**: the identified polluter bears clean-up costs.
    - If a polluter is **untraceable/unable to pay**, expenses will be shared between the **Centre and States**.
- **Criminal Liability:** Any **loss of life or environmental damage** due to contamination will attract penalties under the **Bharatiya Nyaya Sanhita (BNS), 2023**.
- **Exclusions:** Rules **do not apply** to contamination from:
  - Radioactive waste
  - Mining operations
  - Marine oil pollution
  - Solid waste dumps
  - These are governed by **separate, specific legislations**.

Virgin Polymer

Context

A recent study highlights that India accounts for nearly 4% of global virgin polymer production, while China remains the world's largest producer.

About Virgin Polymers

- Virgin polymers are **plastics made directly from raw petrochemical feedstocks** (natural gas, crude oil, or naphtha) without prior use or recycling.
- **Examples:**
  - **Polyethylene (PE)** – widely used in plastic bags, bottles.
  - **Polypropylene (PP)** – automotive parts, food containers.
  - **Polyethylene Terephthalate (PET)** – beverage bottles, textiles (polyester).
  - **Polystyrene (PS)** – disposable cutlery, insulation materials.
  - **Polycarbonate (PC)** – lenses, electronic components
- **Uses**
  - **Packaging:** Single-use bottles, films, food packaging.
  - **Automobiles & Engineering**: Dashboards, bumpers, pipes, machine parts.
  - **Textiles:** Synthetic fibers (e.g., polyester from PET).
  - **Healthcare:** Syringes, medical devices, protective equipment.
  - **Consumer Goods:** Electronics, household appliances.
- **Advantages**
  - Consistent quality and uniform physical properties.
  - Free from impurities, hence better performance in engineering applications.
  - Offer superior durability and mechanical strength.
- **Issues & Concerns**
  - **Environmental Impact:** Non-biodegradable; major contributor to plastic pollution.
  - **Carbon Footprint:** Higher greenhouse gas emissions compared to recycled polymers.
  - **Resource Intensive: Dependent on non-renewable fossil fuels (oil & natural gas).**
  - **Waste Management Challenge**: Lack of effective recycling in India leads to rising microplastics.

India's Battery Waste Management

Context

With the surge in lithium battery waste, India faces an urgent need to strengthen its regulatory framework→In 2022, of the 1.6 million metric tonnes of e-waste generated, lithium batteries alone contributed 7,00,000 tonnes.

About Battery Waste Management Rules (BWMR), 2022

- Released by the Ministry of Environment, Forest, and Climate Change (MoEFCC), it replaced the Batteries (Management and Handling) Rules, 2001.
- **Scope:** Covers **all battery types** – electric vehicle, portable, automotive, and industrial (new and refurbished).
- **Key Provisions:**
  - **Collection & Recycling Targets:** Producers must recycle/refurbish 70% of waste batteries by 2024–25, 80% by 2026, and 90% from 2026–27 onwards, with 100% of collected batteries processed.
  - **Centralized Online Portal:** A digital platform enables registration, EPR certificate management, and real-time

compliance monitoring for producers, recyclers, and refurbishers.

- **Polluter Pays Principle (PPP):** Non-compliant producers are liable to pay environmental compensation.
- **Ban on Unsafe Disposal:** Landfilling and incineration of batteries are strictly prohibited.
- **Mandatory Registration & Auditing:** Only registered recyclers/refurbishers can operate, subject to strict auditing and CPCB monitoring.

Battery Waste Management (Amendment) Rules, 2025

- It aims to strengthen **EPR enforcement**, improve **recycling economics**, and incentivize **use of recycled materials** in fresh battery production.
- **Key Changes:**
  - **EPR Certificate Pricing:** CPCB to set **upper (100%) and lower (30%) price bands** of EPR certificates, linked to environmental compensation payable by non-compliant producers.
  - **Environmental Compensation Guidelines:** CPCB (not just its committees) empowered to prepare and enforce EC guidelines for non-compliance.
  - **Market Reform:** Producers must buy EPR certificates from recyclers/refurbishers at CPCB-notified prices, ensuring a transparent credit-trading system.

Pollutant	Source (Battery Type)	Impact on Health/Environment
Lead (Pb)	Lead–acid batteries	Neurotoxin; damages brain, kidneys, and blood system
Cadmium (Cd)	Nickel–cadmium (NiCd) batteries	Carcinogenic; causes lung and kidney damage
Mercury (Hg)	Button cells, older batteries	Severe nervous system damage; endocrine disruption
Lithium (Li)	Lithium-ion batteries (EVs, electronics)	Highly reactive; risk of fire and explosion; contaminates soil
Cobalt (Co)	Lithium–cobalt batteries	Respiratory issues, skin disease, suspected carcinogen
Nickel (Ni)	Nickel–metal hydride (NiMH), NiCd batteries	Carcinogenic; causes lung and skin problems
Electrolytes & Organic Solvents	Lithium-ion batteries (Li salts, carbonates)	Flammable, corrosive; causes severe burns and toxic fumes

CoP 15 of Ramsar Convention

Context

Ramsar COP15 concluded in Zimbabwe with the adoption of resolutions aimed at wetland restoration, protection of migratory birds, and equitable governance.

Key Takeaways from Ramsar COP15

- **Victoria Falls Declaration:** Called for stronger political will, resource mobilisation, and investment in wetland management.
- **Strategic Plan**: A new 5th Strategic Plan (2025–2027) with 4 goals and 18 targets was adopted, with the Scientific and Technical Review Committee tasked to track progress.
- **Finance:** Parties agreed to a 4.1% budget increase, raising the Convention's budget to CHF 15.5 million ($19.4m) for 2025–2027.
- **Equitable Governance:** A resolution on equitable wetland governance and OECMs (Other Effective Area-Based Conservation Measures) was adopted, promoting inclusive, rights-based conservation aligned with global biodiversity targets.
- **India's Resolution on the Wise Use of Wetlands**
  - Builds upon UNEA Resolution 6/8 (2024) on Promoting Sustainable Lifestyles, advancing a whole-of-society approach for wetlands conservation.
  - Supports Resolution XIV.8 (Ramsar COP14), which emphasises the CEPA approach – Communication, Education, Participation, and Awareness.
  - Endorses the 10-Year Framework on Sustainable Consumption and Production (10YFP) adopted at Rio+20 (2012) to push sustainable consumption and production (SCP).
  - It calls for voluntary adoption of lifestyle-based sustainable practices in wetland management plans, programmes, and investments.
  - Draws from India's Mission LiFE (Lifestyle for Environment) launched at COP26 (Glasgow), promoting pro-planet behavioural shifts.
  - Encourages conscious consumption, waste minimisation, and eco-friendly actions to reduce environmental degradation.

Note: The Ramsar Convention defines wise use of wetlands as "the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development"

Related news

- The **Indo-Burma Ramsar Regional Initiative (IBRRI)** officially launched its Strategic Plan 2025–2030 during a COP15 side event.
- The plan sets out a collaborative, transboundary framework to halt and reverse the loss of wetlands across its Member States.

IBRRI

- Jointly developed by Ramsar NFPs of Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam + IUCN Asia Regional Office.
- Endorsed at 52nd meeting of Ramsar Convention Standing Committee, June 2016.
- Objective: Support coordinated implementation of Ramsar Strategic Plan.

- Secretariat: IUCN.
- Governance: Steering Committee (5 governments) + Ramsar Secretariat (observer).

Article 6 of Paris Agreement

Context

The Ministry of Environment, Forest and Climate Change (MoEF&CC) has set up a **National Designated Authority (NDA)**, a mandatory body under Article 6.4 of the Paris Agreement (2015).

Article 6 of Paris Agreement

- **Article 6** : Enables the use of international carbon markets to help countries achieve their Nationally Determined Contributions (NDCs).
- **Article 6.2**: Countries can cooperate by linking their emissions trading systems through a common accounting framework.
- **Article 6.4, (also known as the Paris Agreement Crediting Mechanism (PACM)):** Create a UN-supervised mechanism to trade emission reduction credits from specific projects.

NDC (Nationally Determined Contributions):

- These are national climate action plans under the Paris Agreement, outlining each country's targets for reducing greenhouse gas emissions.
- They include strategies for both mitigation and adaptation.

India's Current Nationally Determined Contribution (NDC) Targets

- Reduce the **emissions intensity of GDP by 45% by 2030**, compared to 2005 levels.
- Achieve **50% cumulative electric power installed capacity from non-fossil fuel sources by 2030**.
- Develop an **additional carbon sink of 2.5 to 3 billion tonnes of CO_2 equivalent** through increased forest and tree cover by 2030.
- India has already met the non-fossil energy capacity target of 50% by June 2025, five years ahead of schedule.

What is a Nationally Designated Authority?

- These are government bodies that act as the **link between a country and the Green Climate Fund (GCF)**, providing strategic oversight and conveying national priorities for financing low-emission and climate-resilient development.
- **Composition: 21-member committee**, chaired by the **Secretary, Ministry of Environment, Forest and Climate Change**.
- **Countries that have designated an NDA:** 148.
- India has finalized a list of **14 eligible activities under Article 6.4 of the Paris Agreement**, including renewable energy with storage, offshore wind, green hydrogen, green ammonia, sustainable fuels, and carbon capture, utilization and storage (CCUS).

Air Quality Life Index Report

Context

The Air Quality Life Index (AQLI) 2025 report has highlighted high PM2.5 levels in India, especially in Delhi and the northern plains.

About Air Quality Life Index Report (AQLI)

- It is published annually by the Energy Policy Institute at the University of Chicago (EPIC).
- This edition is based on pollution data from **2023.**
- **Objective:** Quantifies the impact of **long-term exposure to PM2.5 pollution** on **life expectancy**.

Major Findings - India

- **Average life expectancy loss**: **3.5 years** due to PM2.5 exposure.
- India's **PM2.5 concentration (2023): 41 µg/m³** (national average).
  - WHO safe limit: **5 µg/m³**.
- **46% of India's population** lives in areas exceeding **national standard (40 µg/m³)**.
- **Delhi (Worst impacted):**
  - PM2.5 level (2023): **88.4 µg/m³.**
  - Life expectancy loss: **8.2 years**.
  - If Delhi meets **WHO standard** → Residents gain **8 years**.
  - If Delhi meets **national standard (40 µg/m³)** → Residents gain **4.7 years**.
- **Situation in other Northern Plains States:** Bihar: Loss of Life Expectancy by **5.4 years**, Haryana: **5.3 years**, **Uttar Pradesh: 5 years.**

Species in News

Species	Description
Asian Giant Tortoise 	**NEWS:** The Asian giant tortoise has been reintroduced into the Zeliang Community Reserve in Nagaland's Peren. • **Distribution**: Found in the **tropical and subtropical forests** of: India (mainly Northeast: **Nagaland and Arunachal Pradesh**), Bangladesh, Myanmar, Thailand, Malaysia & Indonesia. • **Key Features:** – Largest land tortoise in mainland Asia. – **Diurnal, solitary,** and thrives in humid conditions – **Herbivorous –** eats leaves, fruits, mushrooms, and decomposing plant matter.

Species	Description
	– Nicknamed **"small elephant of the forest"** because it aids in **seed dispersal** by consuming fruits and defecating seeds over large distances. ° Helps in **nutrient cycling** and **forest regeneration**. – **Maternal Behavior**: Females build **above-ground nests** and exhibit **maternal care** (rare in tortoises) ° One of the very few tortoise species that **guards its nest** after laying eggs. – **Preferred Habitat**: Dense, **moist lowland and hill forests** rich in **leaf litter** and **undergrowth**. • **Conservation Status:** – **IUCN Red List:** Critically Endangered – **Wildlife (Protection) Act, 1972 (India):** Listed under Schedule IV
Smithophis leptofasciatus 	**NEWS:** A team of researchers from Mizoram University have discovered a new species of rain snake named Smithophis leptofasciatus (**Ruahrul** in Mizo). • **Key Features:** – A glossy black body adorned with **narrow, incomplete creamish-white or yellowish-lime transverse bands** – Nocturnal and semi-aquatic lifestyle. – **3rd Smithophis species** described from Mizoram (besides **S. atemporalis** and **S. mizoramensis**). – Sightings near flowing water and leaf litter.
Asian Palm Civet 	**NEWS:** In an unusual event, proceedings in Kerala High Court were recently interrupted by Asian Palm Civet. • **Distribution: South and Southeast Asia** — including India, Sri Lanka, Indonesia, and the Philippines. • **Key Features:** – Also known as **Toddy Cat** or **Common Palm Civet.** – Nocturnal mammal – Long, slender body with short legs and a pointed snout. – Size: **53–71 cm** in length (including tail); Weight: **2–5 kg**. – Fur: **Brownish-gray** with **black spots**; distinct **white mask-like marking** around the eyes. – **Diet:** Omnivorous—feeds on fruits, insects, and small mammals. – Known for digesting **coffee beans**, used in the production of the world-famous "civet coffee." – Possesses a **keen sense of smell** and excellent **climbing ability**, enabling it to forage in trees. – Primarily **solitary and nocturnal** in behavior. • **Conservation Status:** Listed as **'Least Concern'** on the IUCN Red List.

News in short

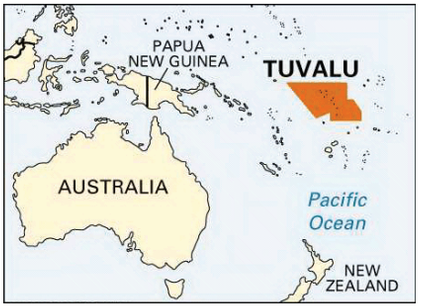
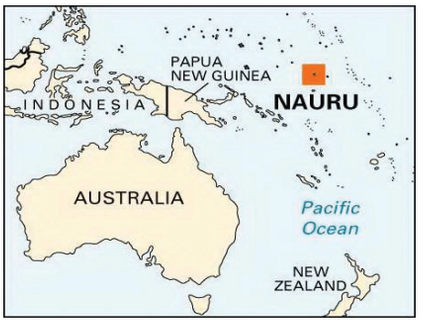
Topic	Details
Indigenously-Built Green Hydrogen Power Plant (GHPP)	• India commissioned its first indigenously-built 1 MW Green Hydrogen Power Plant (GHPP) at Kandla Port, Gujarat. • The plant is capable of producing approximately 140 metric tonnes of green hydrogen annually and is poised to play a crucial role in maritime decarbonisation and sustainable port operations.
Darwin Tree of Life (DTOL)	• It aims to exploit long read technologies to sequence the genomes of all 60,000 species of eukaryotic organisms in Britain and Ireland. • It is a collaboration between biodiversity, genomics and analysis partners that hopes to transform the way we do biology, conservation and biotechnology.
Cold Pools	• A recent study by the University of Washington has revealed that rainfall can sometimes enhance the stability of the ocean's surface by forming cold pools. • Cold pools are localized regions of cooled downdraft air that spread across the surface beneath precipitating clouds. • Formation Mechanism: – During a storm, part of the rainfall evaporates before reaching the ground or ocean surface. – This evaporation process cools the surrounding air, making it denser and heavier. – The cooled air descends rapidly and spreads outward as a shallow "cold bubble," termed a **cold pool**.

Topic	Details
	• Impact on Ocean: – These cold pools increase the density of the ocean's surface water, creating a more stable upper layer. – This stability reduces vertical mixing between surface and deeper waters, influencing heat and nutrient exchange
'Matri Van' Initiative	• It is a new initiative launched in Gurugram to transform 750 acres of the Aravalli hills into an urban forest, under the programme "Ek Ped Maa Ke Naam." • Objective: To strengthen ecological conservation while encouraging active community participation in urban sustainability efforts. • Ecological Restoration Measures: – Removal of invasive plant species. – Plantation of native and climate-resilient trees. – Revival of Aravalli-specific biodiversity and habitats. • Significance: – Enhances green cover and combats urban heat island effects. – Strengthens groundwater recharge and soil stability in the fragile Aravalli ecosystem. – Serves as a model of citizen-led urban ecological revival.
UNDP Equator Initiative Award	• Bibi Fatima Women's self-help group (SHG) from Dharwad district (Karnataka) has bagged the 'Equator Initiative Award'. • About the Award – Also referred to as the Nobel Prize for Biodiversity Conservation. – Presented biennially under the Equator Initiative of United Nations Development Programme (UNDP). – The award underscores the critical role of Indigenous and local communities in delivering nature-centric climate solutions, restoring ecosystems, and promoting sustainable livelihoods.
Environmental DNA	• The focus of scientists is shifting towards eDNA-based technologies as a modern approach for effective biodiversity conservation. • Environmental DNA (eDNA) refers to genetic traces shed by organisms into their surroundings (water, soil, air) through cells, tissues, fluids, or waste. • It enables scientists to detect species presence, abundance, and distribution without directly capturing or observing them. • Advantages: Non-invasive, highly sensitive, rapid, and more cost-effective than traditional biodiversity monitoring techniques. • Applications: Useful for mapping biodiversity, tracking ecosystem health, identifying invasive species, and aiding conservation planning.
GRIHA rating	• Kartavya Bhawan is built to GRIHA-4 green building standards with features like solar panels and rainwater harvesting. • The Green Rating for Integrated Habitat Assessment (GRIHA) is India's national green building rating framework to evaluate sustainability performance. • Originally created by TERI, it was formally adopted as the national standard for green buildings in 2007.
Grassland Bird Census	• The first-ever grassland bird census was conducted in Kaziranga National Park & Tiger Reserve (KNPTR), Assam. • Led by INSPIRE fellow Chiranjib Bora, it focused on the threatened Black-breasted Parrotbill, with participation from forest officials, scientists, and conservationists. • The survey prioritised 10 threatened/endemic species of the Brahmaputra floodplains including Bengal Florican, Finn's Weaver, Swamp Francolin, and others. • Recorded 43 grassland bird species – including 1 Critically Endangered, 2 Endangered, and 6 Vulnerable species.
Environmental Flow (E Flow)	• The Union Jal Shakti Minister chaired a meeting to ensure environmental flow (e-flow) in the Ganga and its tributaries for sustainable river management. • E-flow means maintaining the quantity, timing, and quality of river water necessary to sustain ecosystems and dependent livelihoods. • E-flow safeguards fish habitats, breeding cycles, agriculture, and fisheries, ensuring both environmental health and human welfare.

Topic	Details
Gangotri Glacier	• A new study by IIT Indore, ICIMOD (Nepal), and U.S. researchers has found that the Gangotri Glacier system has lost about 10% of its snowmelt flow in the last four decades (1980–2020). **Key Findings of the Gangotri Glacier Study (1980–2020)** • **Flow Composition (Average 40 years)** – **Snowmelt** = 64% (dominant source) – **Glacier melt** = 21% – **Rainfall-runoff** = 11% – **Base flow (groundwater)** = 4% • **Decline in Snowmelt Share** – 1980–1990 → **73%** – 2000–2010 → **52%** (big drop) – 2010–2020 → **63%** (partial recovery due to colder, wetter winters) **Key Facts About Gangotri Glacier** • **Location**: Uttarkashi district, Uttarakhand (central Himalaya, Garhwal region). **Length**: ~30 km (one of the **largest Himalayan glaciers**). • **Origin of River**: Source of the **Bhagirathi River** (main headstream of the Ganga). • **Feeder Glaciers**: Fed by tributary glaciers like Raktavarn, Chaturangi, Kirti, etc.
Blueberry Production in India	• Blueberry cultivation in India is gaining momentum however domestic output remains **minimal compared to import volumes**. **Facts on Blueberry Production:** • India produces approximately **2,000–3,000 tonnes of blueberries annually** • States leading in blueberry cultivation include **Maharashtra (notably Pune & Nashik), Karnataka (Nilgiri Hills), Himachal Pradesh, Tamil Nadu (Ooty & Kodaikanal), and Uttarakhand (Dehradun & Nainital)** • India imports **over 20,000 tonnes annually** from countries like Chile, Peru, and Panama. **Ideal Condition for Blueberry Cultivation** • Blueberries require a **cool climate, acidic well-drained soil (pH 4.5–5.5), high organic matter, full sun, and drip irrigation**, with chilling hours crucial for many varieties.

Places in News

Place	Details
Sir Bani Yas island 	**News:** An ancient 1,400-year-old Christian cross has been found at a monastery on Sir Bani Yas Island in Abu Dhabi. **Facts** • It is the largest island off the coast of the Al Dhafra Region in Abu Dhabi. • It is now a nature reserve known as the Arabian Wildlife Park. • Historically, it was a center for the pearl trade, which was first noted in European records in 1590.
Dardanelles Strait 	**News:** A narrow strait in northwestern Turkey, it has been temporarily closed to maritime traffic due to raging forest fires in the area. **Facts** • It separates the Gallipoli Peninsula (in Europe) from mainland Asia Minor and acts as a crucial link, connecting the Aegean Sea to the Sea of Marmara. • Its strategic position allows ships to pass from the Aegean Sea to the Black Sea via the Sea of Marmara and the Bosphorus Strait. • The major Turkish ports on the strait include Gallipoli, Eceabat, and Çanakkale. • The Dardanelles has been a key location throughout history, notably as the site of the Persian invasion in 480 BCE and the famous Gallipoli Campaign during World War I.

Place	Details
Tuvalu 	**News:** Tuvalu is set to become the world's first country to have its population formally relocated due to the impacts of rising sea levels. This historic migration to Australia is being carried out under the 2023 Falepili Union Treaty. **Facts** • Formerly known as the Ellice Islands, Tuvalu is a Polynesian nation in the South Pacific, situated between Hawaii and Australia. • It is composed of nine islands, which include both reef islands and coral atolls. • The capital of Tuvalu is Funafuti, and the country gained its independence from the United Kingdom in October 1978. • With no rivers and a tropical climate, Tuvalu has one of the world's smallest populations, numbering around 11,000 people.
Easter Island 	**News:** Rising sea levels could pose a significant threat to the iconic stone statues of Easter Island by 2080. **Facts** • Easter Island is the easternmost part of Polynesia, located in the Southeastern Pacific Ocean. • It is a special territory of Chile. • The island's capital is Hanga Roa. • The island itself was formed by three extinct volcanoes. • The island has a subtropical maritime climate, with warm summers and mild winters. • The Rapa Nui National Park, home to 15 of the famous moai statues, is a designated UNESCO World Heritage Site.
Sea of Japan 	**News:** China and Russia commenced a three-day joint naval drill, "Joint Sea-2025," on the Sea of Japan. **Facts** • Also known as the East Sea, it is situated in the western Pacific Ocean. • It is bordered by Japan and Sakhalin (Russia) to the east, and by mainland Russia, North Korea, and South Korea to the west. • The Sea of Japan connects to other bodies of water through several key straits: the Tsushima and Korea Straits to the south; the La Perouse and Tatar Straits to the north; and the Kanmon and Tsugaru Straits to the east.
Oaxaca region 	**News:** A magnitude 5.7 earthquake has recently struck the Oaxaca region in Mexico. **Facts:** • Oaxaca is a mountainous state situated in southern Mexico. • The region is characterized by its mountainous terrain. • It is located in an earthquake-prone zone because it lies near the intersection of the Cocos and North American tectonic plates
Nauru 	**News:** Nauru has launched a "climate resilience citizenship" program, selling passports to raise funds for climate action. **Facts:** • Nauru is the world's smallest island republic, located in the southwestern Pacific Ocean. • It is also the third-smallest country by area. • It is the first country to directly tie a citizenship-by-investment scheme to climate change adaptation.

Place	Details
Burkina Faso 	**News:** Jihadist violence in Burkina Faso has severely reduced the country's cotton production. **Facts** • Burkina Faso is a landlocked country in Western Africa. • It is unique in that it is one of the few countries in the world that straddles the Prime Meridian, giving it territory in both the Eastern and Western Hemispheres. • It shares borders with Mali to the north and west, Niger to the east, and Benin, Togo, Ghana, and Ivory Coast to the south. • The capital of Burkina Faso is Ouagadougou. • The country's landscape is predominantly composed of savannahs, plateaus, and low mountains, particularly in the southwest. • The northern region, part of the Sahel, is arid and has a more desert-like climate.
El Salvador 	**News:** El Salvador's Legislative Assembly has recently extended the presidential term from five to six years. **Facts** • Located in Central America. • It is bordered on the northeast by Honduras, on the northwest by Guatemala, and on the south by the Pacific Ocean. • El Salvador is the smallest of the seven Central American countries, but also the most densely populated. • It is also known as the "Land of Volcanoes" for its more than 20 active volcanoes. • In 2021, El Salvador made history by becoming the first country to adopt Bitcoin as legal tender, alongside the U.S. dollar.
Mahanadi River 	**News:** Odisha and Chhattisgarh have shown willingness to amicably resolve the Mahanadi river water dispute. **Facts** • The Mahanadi is a major east-flowing river in India, ranking second only to the Godavari in terms of water potential among peninsular rivers. • **Course:** The river originates from the **Sihawa hills** in Chhattisgarh's Dhamtari district. It flows east, entering the Odisha plains near Cuttack, where it forms a large delta before emptying into the **Bay of Bengal** near False Point. • It is approximately **860 km** long. • Its basin is bounded by the Central Indian hills to the north, the Eastern Ghats to the south and east, and the Maikal hill range to the west. • The river basin extends across the states of **Chhattisgarh** and **Odisha**, and also includes smaller areas of Jharkhand, Maharashtra, and Madhya Pradesh. • **Major Tributaries:** Key tributaries of the Mahanadi include the Seonath, Jonk, Hasdeo, Mand, Ib, Ong, and Tel.
Dhauliganga River 	**News:** 12 labourers were injured after a landslip hit the Vishnugad hydroelectric project site (situated on the Dhauliganga River) in Chamoli district, Uttarakhand, India. **Facts** • **Origin:** The river originates near the **Niti Pass**, in the border region between the Garhwal region of Uttarakhand and southwestern Tibet. • **Confluence:** It merges with the **Rishi Ganga River** at Raini, a region noted for its ecological sensitivity. • It is one of the main tributaries of the **Alaknanda River**, which also receives water from the Nandakini, Pindar, Mandakini, and Bhagirathi rivers. • The Dhauliganga merges with the Alaknanda at **Vishnuprayag**, one of the five sacred confluences, or Panch Prayags, of Uttarakhand. • The river is approximately **94 kilometers** long. • The town of Tapovan, famous for its natural hot springs, is located along the banks of the Dhauliganga.

Place	Details
Lipulekh Pass 	**News:** India has dismissed Nepal's objections to reopening the India–China border trade via the Lipulekh Pass, stating that Kathmandu's claims lack historical validity. **Facts** • It is a high-altitude mountain pass in the Kumaon region of Uttarakhand, strategically located near the trijunction of India, Nepal, and China. • It serves as a vital gateway to the higher Himalayas and is historically significant as an ancient trade route connecting the Indian subcontinent with the Tibetan plateau. • In 1992, Lipulekh was the first Indian border post to be opened for trade with China. It was followed by Shipki La in Himachal Pradesh in 1994 and Nathu La in Sikkim in 2006. • The pass holds immense religious significance as part of the Kailash Mansarovar Yatra pilgrimage route, with the old pass situated in the Vyas Valley of Uttarakhand's Pithoragarh district.

INTERNATIONAL RELATIONS & INTERNAL SECURITY

TOPICS FOR MAINS

India- Myanmar

Syllabus Mapping: GS-2 Neighbourhood of India

Context

In light of the Myanmar junta ending the state of emergency and announcing elections for December—even as a complex civil war continues—India must recalibrate its foreign policy towards Myanmar to strengthen its influence over its eastern neighbour.

China's Strategic Backing of Myanmar's Junta

- **Motivation**: Preserve Chinese interests in Myanmar, especially strategic infrastructure under **One Belt One Road (OBOR)**.
- **Support Includes**:
  - Diplomatic and political pressure on **Ethnic Armed Organizations (EAOs)**.
  - Supply of **arms, aircraft, drones**, and **communication technologies**.
  - **Training pilots** and **deploying technicians** to Myanmar's defense sector.
  - **Stationing private security personnel** at key OBOR infrastructure like **Kyauk Phyu Port** in Rakhine State.

India's Emerging Strategic Opportunity

- **Due to**: Rising **anti-China sentiment** among Myanmar's ethnic minorities and the Bamar majority.
- **Reason**: China's coercive tactics — including **border closures**, **supply disruptions**, and **military support to the junta** — have alienated large sections of the Myanmar population.
- **Implication for India**: A **strategic opening** to engage with **resistance groups**, support **inclusive development**, and counter Chinese influence in its immediate neighbourhood.

Significance of Myanmar for India

- **Strategic Location:**
  - **Shared Border**: India and Myanmar share a **1,643 km-long border** with four northeastern states — Arunachal Pradesh, Nagaland, Manipur, and Mizoram.
  - **Gateway to Southeast Asia**: Myanmar is a vital link for India's **Act East Policy** and a bridge to ASEAN.
- **Geopolitical Buffer:** Acts as a **strategic buffer between India and China**.
  - Myanmar's tilt towards China increases India's security concerns, especially in the Bay of Bengal and northeastern borders.
- **Security Concerns:**
  - **Insurgency in Northeast India**: Some Indian insurgent groups (like NSCN-K, ULFA) have used Myanmar territory as a safe haven.
  - **Counterterrorism coordination** with the Myanmar Army has been critical for operations like **Operation Sunrise**.
- **Economic & Connectivity Interests:**
  - **Natural resources**: Myanmar is rich in oil, gas, timber, and rare earths.
    - India seeks to secure energy imports and investment opportunities.
  - Enhancing **land-sea connectivity** through Myanmar is crucial for trade with ASEAN.
- **Cultural and Ethnic Linkages:** Strong people-to-people links, especially among **Chin, Kuki, and Mizo communities** across the border.
  - **Buddhist cultural heritage** strengthens soft power ties.

Key India-Myanmar Projects and Agreements

- **Kaladan Multi-Modal Transit Transport Project:** Connects Kolkata port to **Sittwe Port (Myanmar)** by sea, then to **Mizoram** via river and road.
  - Aims to reduce dependence on the Siliguri Corridor for Northeast India's connectivity.

- **India-Myanmar-Thailand Trilateral Highway: 1,360 km highway** connecting **Moreh (Manipur) to Mae Sot (Thailand)** via Myanmar.
  - Part of the broader plan to integrate India with ASEAN.
- **Border Area Development Projects:** India supports infrastructure development (roads, schools, health centres) in **Sagaing and Chin** regions of Myanmar to promote stability and development.

How India Should Recalibrate Its Myanmar Policy Post-2021 Coup

- **Support Democratic Forces Strategically:** Engage with **National Unity Government (NUG)** and ethnic groups pushing for federal democracy.
  - Provide **capacity-building, legal aid, and technical support** for constitution drafting and governance reforms.
- **Leverage India's Democratic Federal Model:** Share India's **experience in managing multi-ethnic federalism**, which is relevant as Myanmar's opposition seeks to replace the 2008 military-drafted constitution with a **federal democratic one**.
- **Stop Arms and Fuel Supplies to the Junta:** Immediately **halt sales of dual-use/military goods** to the junta, which uses them against civilians.
  - Aligns India with international norms and distances it from China's transactional engagement.
- **Humanitarian Assistance & Border Policy Reform: Reinstate Free Movement Regime (FMR)** for border tribes.
  - Open **cross-border aid corridors** in Mizoram and Manipur, modelled on **Thailand's humanitarian corridors**.
  - Collaborate with **UN agencies and NGOs** to provide aid without junta control.
- **Protect Asylum Seekers and Refugees:** Uphold the principle of **non-refoulement**, halt deportations, and treat those fleeing as **refugees, not illegal migrants**.
  - Set up **humane refugee shelters**, especially in Northeast states with shared ethnic kinship.
- **Outmaneuver China through Values-Based Diplomacy:** Unlike China's **authoritarian alliance with the junta**, India can become the **champion of federal democracy and human security** in Myanmar.
  - This will boost India's **soft power**, secure goodwill, and maintain influence in the region.

Conclusion

India must **go beyond realpolitik** and transactional diplomacy in Myanmar. By anchoring its Myanmar policy in **democracy, human security, and regional solidarity**, India can:

- Reclaim moral leadership in Southeast Asia,
- Counterbalance China's growing clout,
- Strengthen its Act East Policy, and
- Enhance regional stability that directly impacts India's own border security.

India's Geopolitical Challenge

Syllabus Mapping: GS-2 Foreign policy of India

Context

India is at a crucial point in global geopolitics. Power balances are shifting, but India is not gaining as much influence as it should. It needs to act more boldly on the global stage.

What Challenges India Is Facing In Geopolitical Landscape?

- **Silence On Acting Against Terrorism:** Operation Sindoor was India's response to a terror attack in Pahalgam (April 2025), carried out by Pakistani terrorists.
  - Despite clear evidence, many of India's partners stayed silent on Pakistan's role.
- **U.S.-India Friction:** On the same day India-U.S. launched a major satellite (NISAR), the US imposed **25% tariffs** on Indian goods.
  - Trump **threatened more tariffs** if India kept buying oil from Russia — even though the U.S. itself still trades with Russia.
  - Also discouraged U.S. companies from investing in India, pushing an "America First" agenda.
- **EU's Uneven Treatment:** The EU sanctioned an Indian refinery using Russian oil but **allows its own members** to keep buying from Russia.
  - It continues to impose **trade barriers** on India while negotiating a new trade deal (India-EU Broad-based Trade and Investment Agreement (BTIA)).
  - India is hoping its trade deal with the UK might pressure the EU to be more fair.

- **China's Growing Influence:**
  - China is making moves in India's neighborhood:
    - Proposed new alliances (like China-Pakistan-Bangladesh).
    - Helped Bangladesh revive an old airbase near India's Siliguri corridor.
    - Supported Pakistan during Operation Sindoor.
    - Debt trap diplomacy in SriLanka, Bangladesh etc
- SriLanka had Lease Hambantota Port to China for 99 years.
    - **Bhutan**: Although stable, Bhutan's King has shown a slight tilt towards China, reflecting broader regional trends.
  - Trying to **control key supplies to India** like Fertilizers, Medicines (APIs) and Rare earths
    - 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.
  - Building a **huge dam on the Brahmaputra** river near India's border.
- **Passive Foreign Policy Image:** India has stayed **neutral or silent** on major global crises (e.g., Gaza, Ukraine, Iran-Israel).
  - While neutrality offers flexibility, it also **limits influence** and support from global powers in return.
- **Relation with Russia:** Longtime defense partner, but **Close ties with China** trouble India. India's neutral stance on the Ukraine **war** raised eyebrows in the West.

Underlying Factors in Regional Discontent

- **India's big brother attitude:** India feels that it is a regional hegemon in the sub-continent and sees South Asia as its own backward.
- For example, Concerns in Nepal when India blockaded its trade through India.
- **India's poor track record in facilitating development in South Asia:** India has been slow in fulfilling its developmental projects, often there are large cost and time over-runs tarnishing India's image as a reliable development partner in the region.
- For example, the Kaladan Multi-modal project has still not been completed.
- **China's Counterbalancing Role:**
- Neighbouring countries increasingly use China to counterbalance India's influence.
- China's asymmetric capabilities to offer larger developmental support in terms of aid or loans, makes the South Asian countries look towards China for boosting their development.
- **For example:** Nepal uses China card to balance India in its foreign policy.
- **Interference in domestic Politics:** Many of the challenges stem from long-standing practices of Indian interference and dominance, not unique to the Modi government.
- The stay of ousted leader Sheikh Hasina in India has infuriated the people of Bangladesh.
- Playing the **anti-India card** remains a rewarding political strategy for many leaders in South Asia.
- **India's Foreign Policy Approach**
- **Lack of Clear Priorities:** "Neighbourhood First" policy lacks clarity on whether it prioritises neighbourly concerns or India's global aspirations.
- **Overreach Without Gains:** India's interventions have not delivered significant strategic benefits, eroding moral authority and trust.
- **India's attitude towards SAARC:** Despite the promise of SAARC grouping India has been sceptical about it and sees the grouping as an institution where its neighbours can lobby against India.

Way Forward

- Push back against unfair treatment as done in exposing the double standards of the U.S. and EU.
- Speak up more on global conflicts as called for a **ceasefire in Gaza**, signaling a more active foreign policy.
- To stop further damage in U.S.-India ties, India must **finalize a trade deal with the U.S.** soon.
- India may not restart the **RIC (Russia-India-China)** alliance, but it should:
  - Strengthen **BRICS** (India hosts the 2026 summit).
  - Reconnect with the **SCO** (Shanghai Cooperation Organisation).
  - Engage more with **East Asia**, especially after missing out on the **RCEP**.

Managing the Neighbourhood:

- **Help in Economic distress:** Project itself as the first responder in any economic distress situation will help build mutual respect among the people of the neighbourhood.
  - For example, India helped Maldives in debt default with a $100 million treasury bills roll over and $400 million currency swap deal.

- **Regional trade:** South-Asia is the least integrated region with respect to the trade as South Asia's intra-regional trade is only 5% of the region's total trade. It can be increased through ensuring speedy custom clearance and simplifying payment procedures besides bridging connectivity deficit.
- **Regional organisation:** After the defunct SAARC, there is a need for continuous diplomatic talks of BIMSTEC countries to further the engagement in various aspects among the member countries.
- **Capacity building in the Neighbourhood:** Effectively utilising the development initiatives like ITEC in the neighbourhood will help the trust building with the neighbourhood.
- **South-South cooperation:** Countries in the neighbourhood face similar problems like poverty and hunger. India should advance this concern in the regional groupings like BRICS and G20 which will help building mutual trust. For example,
  - India should raise the issue of the **3F Crisis(Crisis of Food, Fuel and Fertiliser)** emerging with the conflict in Ukraine and Middle East.It is impacting mostly the South countries.
  - India advocated increase of the membership of south countries in the BRICS
  - India invited Bangladesh in the G20 summit as a guest country in its presidency in 2023.
- **Utilising complementariness in hydro-energy:** India should increase investment in Nepal and Bhutan to boost their hydroelectric output and export surplus power to India. It will be win-win for both.

India–Namibia Relations: A New Model of Engagement

Syllabus Mapping: GS-2 Bilateral Relations

Context

India is quietly reshaping its Africa engagement, with smart and issue-based partnerships which is evident in India's engagement with Namibia.

India's Three-Step Diplomatic Logic

- **Shared Historical Solidarities**
  - Evoking anti-colonial heritage and liberation struggles.
  - India's role in Namibia's independence: hosting SWAPO's first diplomatic office and Indian General Prem Chand commanding UN peacekeeping forces during transition.
  - Builds credibility of "long-haul" engagement vs. episodic Western presence.
- **Present Pragmatic Cooperation**
  - Bilateral trade: $800 million, modest but growing.
  - India's wider $12 billion development partnership across Africa.
  - Key projects:
    - India-Namibia Centre of Excellence in IT at NUST.
    - "India Wing" at Ongwediva campus (funded by $12 million).
  - Capacity-building in IT aligns with Namibia's youthful, tech-ready population.
- **Future-Oriented Knowledge Partnerships**
  - Namibia: first African nation to adopt India's **Unified Payments Interface (UPI)**.
  - Potential transfer of not just digital tools but also India's **regulatory models and institutional design** in tech governance.
  - Signals rise of tech diplomacy as a pillar of South-South cooperation.
- **Key Modalities of Engagement**:
  - **Lines of Credit (LoCs):** Main instrument under Indian Development and Economic Assistance Scheme (IDEAS), funding infrastructure, health, education projects.
  - **Capacity Building:** Flagship programmes like Indian Technical and Economic Cooperation (ITEC), e-ITEC, and Pan Africa e-Network to train officials and professionals.
  - **Technology Transfer:** Sharing affordable technologies in health, agriculture, and digital public infrastructure (e.g., UPI, CoWIN platform).
  - **Grants and Concessional Finance:** Direct grants for social sector projects.

Namibia's Strategic Importance for India

- **Stability & Resources**: Politically stable, rich in uranium and other minerals, with a growing tech base.

- **Alignment in Vision**: Namibian leadership echoes India's calls for **fairer global financial systems** and South-South solidarity.
- **Global South Role**: Seen as a like-minded partner in reshaping international rules.

Gaps and Missed Opportunities

- **Symbolism vs. Substance**: First Indian PM visit in nearly 30 years produced only modest outcomes—two MoUs (entrepreneurship and health), Namibia joining Global Biofuels Alliance and CDRI.
- **Issues in Implementation:** India's developmental ambitions are often criticised for uneven implementation.
- **Critical Minerals Gap**: Despite Namibia's status as a top uranium producer, no concrete strategic framework on resource cooperation was finalised (e.g., value addition, workforce training, resilient supply chains).
- **Consistency Problem**: India's Africa engagement has historically seen long gaps, raising concerns about sustained follow-through.

Way Forward

- **Beyond Symbolism**: India needs consistent, institutionalised engagement, not episodic gestures.
- **India-Africa Forum Summit**: Upcoming summit could be a platform to:
  - Formalise cooperation frameworks.
  - Expand knowledge partnerships (digital, health, education).
  - Secure critical minerals collaboration.
- **Credibility Test**: India's role as a Global South leader depends not only on commitments but also on **delivery, consistency, and inclusivity**.

Ways to enhance Economic Cooperation:

- **Aid to FDI:** As African countries are worried to debt stress, the preferable model for financing should move from LOC-led model to an FDI led model including PPP projects
- **Trilateral partnerships:** can be formed for a range of sectors such as agriculture, industrial development, skill development etc.
- **Access to finance:** India needs to open more bank branches in Africa. It must also provide long term risk insurance.
- **Establishing a Free Trade Agreement (FTA):** to facilitate trade, investment, and economic cooperation.
- **Lower transaction costs**: i.e. lowering shipping and insurance costs, to facilitate trade.

Importance of Africa

- **World's growth hotspots:** half a dozen of the nations with the fastest economic growth this decade
- **E.g.** Ethiopia is one of the fastest-growing economies with an estimated 8.1% growth in FY2023/24.
- **Market:** Sizeable market with population of over one billion people and a GDP of 2.5 trillion dollars.
- **Abundant Natural resource:** metals like gold and other metals, leather, gas, pulses and lentils, and crude oil
- **E.g. South Africa** and **Ghana** are top gold producers.
- **E.g. Mozambique** supplies pulses to India.
- **Energy Security:** India seeks to diversify its oil supplies away from the Middle East.
- Nigeria is a major oil exporter
- **Maritime security:** Gulf of Guinea, part of West Africa's maritime zone, is critical for global trade and energy supplies.
- **E.g. Security cooperation** is expanding with countries like **Kenya, Mauritius, and Seychelles** to ensure safe sea lanes.
- **Counterbalancing China's Influence**: Strengthening ties with African countries helps India maintain its influence and diversify partnerships.
- **Indian Diaspora**: Africa is home to a vibrant Indian community involved in business, especially in South Africa, Nigeria and Ghana.
- **South Africa** has over 1.5 million Indian-origin people, with strong political and economic representation.
- Indian businesses flourish in **Nigeria, Kenya, and Tanzania**, fostering people-to-people ties.
- **UN reform:** Its support is crucial for India's bid for a permanent seat in the **UNSC.**
- E.g. India has consistently lobbied through **IBSA (India-Brazil-South Africa) and G4 grouping**, seeking backing from the African Union (AU).
- **South-South Cooperation**: India promotes development partnerships under South-South Cooperation frameworks.
- E.g. Initiatives like **IAFS (India-Africa Forum Summit)**, **ITEC scholarships**, and the **e-VidyaBharti and e-ArogyaBharti projects** promote human capital development.

US imposes 25% Tariffs on India

Syllabus Mapping: GS-2: Bilateral Relations

Context

US President Trump declared a 25% tariff on India, effective from 1st August, 2025. The additional 25% tariff imposed by Trump on India for its purchases of Russian oil came into effect on August 27, 2025, bringing the total amount of levies imposed on New Delhi to 50%.

Reason behind Tariffs against India

- **Funding the Ukraine war:** US has alleged that India's purchase of Russian oil is helping fund the war in Ukraine.
- **Trade Deficit:** The U.S. has a growing trade deficit with India ($45.7 billion in 2024), seen as unfair by the Trump administration.
- **Trade Barriers:** India's food safety rules and farm subsidies are viewed by the U.S. as unfair obstacles to American exports.
- **Import Tariffs by India:** The U.S. argues that **India maintains high import duties** on a wide range of American goods (e.g. electronics, Harley-Davidson motorcycles), creating an uneven playing field.
- **Pharmaceutical Pricing Policies:** India's price controls on essential medicines are seen by the U.S. as **unfavorable to American pharma firms** that want to operate profitably in the Indian market.
- **Chief source of Revenue:** Trump's belief that tariffs act as a tax on outsiders rather than on US consumers. "Therefore it's a cheap way of getting revenues, which can then help offset some of the tax cuts that he has made
- **BRICS Involvement:** India's role in BRICS and support for non-dollar trade is seen as a threat to U.S. global economic influence.

India-US trade relations

- The U.S. was India's largest trading partner for the fourth consecutive year in 2024-25 with bilateral trade valued at $131.84 billion.
- Among India's top 10 trading partners, the US is the only country with which India has a positive trade balance which shows that the **USA is the most important export market for India.**
- Indian exporters were denied the preferential treatment under GSP in 2019. However, according to the report published by SBI, Indian exporters has developed a **Revealed Comparative Advantage (RCA)** in exports of metals, minerals, chemicals, footwear, textiles, and intermediate clothing goods with respect to China. Thus India-US trade surged after revocation of GSP.
  - **India's merchandise exports to America:** rose by 46 per cent from USD 53.1 billion to USD 77.5 billion between FY 2020 and FY 2024.
  - **Imports from the US** also grew to USD 42.2 billion last fiscal from USD 35.8 billion in 2019-20.
  - **Trade in services:** expanded 30.3 per cent from USD 54.1 billion in 2018 to an estimated USD 70.5 billion in 2024.

India- Russia Energy Cooperation

Oil and Gas Cooperation

- Indian import of crude oil from Russia has increased from less than 2 per cent of India's total imports before the Russian invasion of Ukraine to over 40 per cent in June 2024. With this India overtook China as the world's biggest importer of Russian oil in July 2024.
- Russia has become the **largest supplier of crude oil.** Iraq is the second-largest oil supplier to India, followed by Saudi Arabia and the United Arab Emirates.

The main reason for the increase in oil imports is due to the **discounted price** offered by Russia which is due to the price cap imposed by Western countries on Russian oil.

- Russia is India's "largest" oil and gas investment destination for the exploration and production of hydrocarbons. India has invested billions of dollars in the Russian oil and gas sector.
  - Indian companies bought a **100 percent stake** in Russia's Imperial Energy Corporation, along with a **26 per cent stake in the Vankorneft oil field** in Northern Russia.
- Also, Russia has been a long time energy partner for India. ONGC Videsh Ltd. made a $1.7 Bn investment in 2001 for a 20% stake in **Sakhalin-1 oil field** in the Russia Far East, with production starting in 2006.
  - Before the Ukraine crisis, Sakhalin-1 was producing 220,000 barrels of oil per day, with ONGC selling its share of oil mostly in the International market.
- In September 2019, India and Russia launched a **Vladivostok-Chennai energy corridor** to boost energy cooperation between two countries.
- India also received **1st cargo of Russian LNG (Liquified Natural Gas) in 2018** and both countries are working together to enhance LNG imports from Russia.
- Two sides have agreed for the expansion of cooperation in the gas sector and have created the **Gas Task Force** to identify mutually beneficial areas including the development of investment in **gas infrastructure and distribution projects**, use of natural gas in transport and emerging fuels including hydrogen.

India's response to US's Tariffs:

India supported the purchase of Russian Oil as it is:

- **Driven by National Interest:** India has consistently stated that its foreign policy and trade decisions are based on national interest, not on alignment with geopolitical blocs.
  - **E.g.** India's stance is to buy from wherever it is cheapest and most stable to keep energy affordable for 1.4 billion people.
- **Stabilises the global oil market:** India argues that its purchases of Russian oil **Absorb displaced Russian supply** (due to Western bans), preventing a **global supply crunch**. It will help maintain **price stability** in global oil markets by **keeping Russian oil flowing**.
- **EU is importing gas from Russia:** While the U.S. and EU have criticized India's oil imports from Russia, **many EU countries continued importing Russian natural gas** (directly or indirectly).
  - **E.g. Germany, Hungary, and Austria**, among others, **maintained pipeline gas imports** or **liquefied natural gas (LNG)** from Russia well after the Ukraine invasion.
- **India Is Not Violating Any International Sanctions:** India has respected **UN-sanctioned frameworks**, but has **not accepted unilateral sanctions** by any country, including U.S. and EU ones.
- **Global South Needs Affordable Energy**
  - India often positions itself as a **leader of the Global South**, advocating for **energy justice**.
  - India's purchases help **stabilize local fuel prices**, indirectly aiding other Global South nations

Way Forward for India

- **Uphold Strategic Autonomy:** India must stand firm on its sovereign right to energy trade decisions, while engaging diplomatically to avoid further escalation.
- **Intensify Diplomatic Engagements:** Proactively engage with both the US and Russia to explain India's position, seek exemptions, and highlight the need for a pragmatic, multi-aligned foreign policy.
- **High-Level Trade Dialogue with the U.S.:** Initiate a focused Trade & Strategic Energy Dialogue with the U.S. to find common ground and prevent a wider tr**ade war.**
- **Diversify Trade & Energy Sources:** Accelerate efforts to diversify India's export markets and reduce overdependence on any single country for critical imports such as energy and defense equipment.
- **Strategic Policy Balancing:** Maintain a careful balance in relationships, ensuring neither the US nor Russia feels alienated, while safeguarding India's strategic and security interests.
- **Strengthen Domestic Manufacturing:** Invest in domestic capacity-building for defense and energy to reduce vulnerabilities stemming from external pressures or supply chain disruptions.
- Tariffs will hurt sectors like **pharmaceuticals, textiles, steel, and auto components**. India must shield domestic exporters
- **Multilateral Collaboration:** Work with other major economies and multilateral forums to build consensus on avoiding unilateral sanctions, promoting dialogue over punitive economic measures.

IMEC

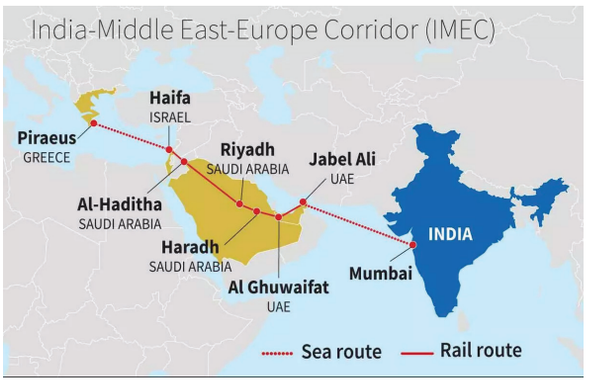
Syllabus Mapping: GS-2 Trans-continental projects

Context

Amid rising trade tensions and **U.S. tariffs on Indian goods, the U.S. is sending White House adviser Ricky Gill to Delhi for talks and the IMEC** (India-Middle East-Europe Economic Corridor) conference.

About IMEC (India-Middle East-Europe Economic Corridor)

- **Purpose**: A strategic connectivity initiative aimed at enhancing trade and infrastructure integration between India, the Middle East, and Europe through ports, railways, roads, pipelines, and sea routes.
- **Announcement**: Launched in **2023** on the sidelines of the **G20 Summit in New Delhi**, through an MoU signed by: European Union, India, United States, Saudi Arabia, United Arab Emirates (UAE), France, Germany and Italy
- **Corridor Structure**:
  - **Eastern Corridor**: Links **India** to the **Arabian Gulf**.
  - **Northern Corridor**: Connects the **Arabian Gulf** to **Europe**.



- **Key Transport Links**:
  - Shipping route from **Mumbai** and **Mundra (Gujarat)** to **UAE**.
  - Rail link from **UAE** → **Saudi Arabia** → **Jordan** → **Israel's Haifa Port**.
  - Sea route from **Haifa (Israel)** to **Piraeus (Greece)**, further connecting to **European ports**.
- **Supplementary Infrastructure**:
  - Integrated **railways**, **roadways**, and **shipping** systems.
  - Additional infrastructure for **Electricity grids, Optical fiber cables** for digital connectivity and **Pipelines** for transporting **hydrogen gas**

Benefits of IMEC

- **Transit Time Reduction**: Projected to reduce transit time between its eastern & western nodes by 40%.
- **Cost Efficiency**: Transportation costs are expected to decrease by 30% compared to routes via the Suez Canal.
- **Impact on Maritime Trade:** Once operational, IMEC is anticipated to be transformative for international maritime trade.
- Resilience Supply chain: It will help ensure supply chain resilience in the participating nations
- **Countering BRI:** It is expected as a direct counter to China's BRI by offering an alternative trade route. Benefits over BRI:
  - IMEC emphasizes financial sustainability and fair investment practices unlike debt burden under BRI
  - Unlike China's state-driven approach, IMEC seeks to engage multiple stakeholders, including India, Europe,USA, and Gulf nations
- **Strengthens India's economic and political ties** with Middle Eastern nations, including the UAE and Saudi Arabia
- **Inclusion of electricity grid:** facilitates the export of green energy
- **Proposed clean hydrogen pipeline:** facilitate clean hydrogen that could be the long-term alternative to fossil fuels
- **high-speed data pipeline:** facilitate the export of India's IT services to Europe and West Asia
- It will lead India to establish itself as a major global manufacturing and trade hub.
- Energy Security: It will allow India to streamline its access to Middle Eastern oil and gas resources.

Challenges to IMEC

- **Geopolitical tension:** Despite initial optimism, geopolitical tensions (escalation of conflict between Israel and Palestine) have hindered progress on the IMEC.
- **Coordination**: There are issues with coordination among the multiple countries involved.
- **Regional competition**: Competition from China's BRI will impact the IMEC's operational strategy and political and economic interests.
- **Security threats:** Security threats from the Houthi rebels in the Red Sea pose another challenge
- **Financial Hurdles:** As a grand economic initiative, the IMEC faces considerable financial hurdles that could determine its feasibility
- **Exclusion of important regional players** such as Egypt, Oman, and Turkey raises concerns about the corridor's inclusivity.

Way Forward

- **Regional Stability:** Multistakeholder consensus should be reached in favour of IMEC despite various regional conflicts
- **Financial sources:** Securing private sector investment to ensure its success.
- **Overcome logistics challenges:** standardizing rail gauge systems and customs regulations across multiple countries

To maximize the potential benefits of IMEC, India should focus on:

- **Port Development:** Enhancing port infrastructure and creating specific economic zones along connectivity nodes.
- **Logistics Improvement:** Upgrading domestic logistics systems to integrate seamlessly with IMEC.
- **Digital Integration:** Expanding digital capabilities within logistics to reduce time and costs associated with exports.
- **Global Value Chain Integration:** Strengthening manufacturing competitiveness to position India as a viable alternative in global supply chains.
- **IMEC Secretariat**: Establishing a formal IMEC secretariat could organise & streamline the corridor's structure, trade processes etc.

TOPICS FOR PRELIMS

US sanctioned Indian companies

Context

6 Indian Companies Sanctioned By US Department of State over Iran Petroleum Purchases

About these sanctions:

- The United States imposed sanctions under Executive Order 13846.
- The US claims that the Iranian regime uses revenue to fuel conflict in the Middle East, fund terrorism, and oppress its people
- Six Indian companies were identified among the 20 entities globally.

Sanctions Implications

- Any money, property, or business interests these companies have in the US or controlled by US citizens are frozen.
- If a company is owned 50% or more by a blocked person or company, it's also automatically blocked.
- US people and businesses can't:
  - Do business with blocked companies or people.
  - Give or receive money, goods, or services from them.
  - Even if the transaction passes through the US, it's still banned.

Balfour Declaration

Context

The **Balfour Declaration** is back in focus as the **U.K.'s possible recognition of Palestine**—108 years after endorsing a Jewish homeland in Palestine.

About the Balfour Declaration (1917)

- Issued by the British government during World War I.
- Declared support for the establishment of a **"national home for the Jewish people"** in Palestine.
- Palestine was then part of the Ottoman Empire with a small Jewish minority.

Origins

- Came in the form of a letter from **British Foreign Secretary Arthur Balfour** to **Lord Rothschild**, a British Jewish leader.
- Officially published on **November 9, 1917**.

Historical Background

- Issued during **World War I (1914–1918)** as the **Zionist movement** was gaining momentum.
- Zionism aimed to establish a homeland for Jews facing persecution in Europe.

About the Zionist Movement

- Founded on the belief that Jews needed their **own sovereign nation** to escape persecution.
- **Theodor Herzl**, regarded as the father of Zionism, proposed this idea in his 1896 work **"Der Judenstaat"**.
- Prominent Zionist figures like **Chaim Weizmann** (later Israel's first president) and **Nahum Sokolow** lobbied Britain for support.

Why Did Britain Support the Idea?

- **Strategic Interests**: Palestine's location was vital to **protect the Suez Canal** and the route to **British India**.
- **Political Calculations**: Hoped to win support of Jewish communities in **Russia and the USA** to strengthen the Allied war effort.
- **Sympathy for Jewish persecution** also played a role.

Why Is the Balfour Declaration Controversial?

- **Britain promised land it didn't control** – Palestine was under Ottoman rule.
- **Contradicted previous British promises** to Arabs in the **McMahon-Hussein Correspondence (1915–1916)**, which promised Arab independence in exchange for support against the Ottomans.
- It recognized **"civil and religious rights"** of non-Jews but ignored their **political rights**.
- No **Palestinian or Arab leader** was consulted before issuing the declaration.
- Seen as the beginning of **a long-standing conflict** in the region.

Act East Policy

Context

Indian Railways commissioned a new **51.38 km rail line to Sairang near Aizawl**, boosting regional connectivity and strengthening the **Act East Policy**, despite cross-border project delays due to regional instability.

Act East Policy

- Launched in **2014 by PM Narendra Modi**, replacing the older **Look East Policy**.
- Focuses on strengthening **economic, strategic, and cultural ties** with **Southeast Asia and Indo-Pacific** nations.
- Aims to transition India's approach from passive observation ("Look") to **active regional participation** ("Act").

Objectives of the Act East Policy

- Enhance **economic engagement** through increased trade, investment, and market access in the Indo-Pacific region.
- Deepen **cultural understanding and people-to-people relations** via educational and cultural exchanges.
- Build **long-term strategic partnerships** through **bilateral, multilateral**, and regional dialogues.
- Promote **regional cooperation and integration** in political, economic, and socio-cultural domains.
- Collaborate on **shared challenges** like terrorism, maritime security, and disaster management.

Three Pillars of the Act East Policy

- **Economic Pillar:**
  - Integration with global supply chains
  - Boost trade and investment in East and Southeast Asia
- **Socio-Cultural Pillar:**
  - Foster mutual understanding
  - Promote shared cultural and civilizational links
- **Political-Security Pillar:**
  - Enhance defense cooperation
  - Promote regional stability and balance of power

Key Features

- **ASEAN-Centric Approach**: Close alignment with ASEAN and participation in ARF, EAS, and ADMM+.
- **4C Framework**: Focus on **Culture, Commerce, Connectivity, and Capacity Building**.
- **Strategic Security Ties**: Partnerships with countries like **Japan, Vietnam, and the Philippines**.
- **Connectivity & Infrastructure Focus**: Cross-border highways, rail links, and digital platforms.
- **Multilateral Engagement**: Active participation in **ASEAN, BIMSTEC, and EAS** for regional cooperation.

Major Projects under Act East Policy

- **India-Myanmar-Thailand Trilateral Highway** – Boosts road connectivity.
- **Kaladan Multi-Modal Transit Project** – Connects eastern ports of India with Myanmar's Sittwe port.
- **Agartala–Akhaura Rail Link** – Enhances connectivity between Northeast India and Bangladesh.
- **Digital Public Infrastructure (DPI)** – Advances digital ties through India-ASEAN Fund.
- **Mekong–India Economic Corridor** – Links India's east coast with Southeast Asia.
- **ITEC Programme** – Capacity building for Cambodia, Laos, Vietnam, etc.
- **International Buddhist Confederation (IBC)** – Promotes shared Buddhist heritage.
- **BIMSTEC Initiatives** – Encourages regional cooperation around the Bay of Bengal.

AI Code of Practice on General-Purpose (GPAI)

Context

26 major tech companies, including Amazon, Google, Microsoft, and IBM, have voluntarily signed the EU Commission's AI Code of Practice on GPAI.

About the EU AI Act

The **EU AI Act** is the **world's first comprehensive legislation** regulating artificial intelligence.

- **Risk-Based Approach:** It adopts a **risk-based regulatory framework**, applying stricter rules to AI systems based on the level of risk they pose to society.
- The Act establishes **clear accountability standards** for AI developers and providers, significantly impacting companies that use **generative AI**—especially through their supply chains and third-party partnerships.
- **Transparency :** Requires clear documentation and disclosure of AI system operations.
  - Mandates regular **audits and risk assessments** for high-risk AI applications.
- **Unacceptable Risk:** Prohibits real-time remote biometric identification, except for narrowly defined exceptions (e.g., searching for victims of serious crimes).
- Similar to the **General Data Protection Regulation (GDPR)**, the EU AI Act is expected to set a **global benchmark**, aiming to ensure that AI technologies are used ethically and for the greater good.
- **Non-compliance** can lead to hefty fines, with penalties reaching up to **7% of a company's global annual revenue**.

Steps taken for the AI regulation

- **Bletchley Process**
  - Initiated by the **U.K. Safety Summit (November 2023)** and expanded at the **South Korea Safety Summit (May 2024)**.
  - Aims to establish an **international network of AI Safety Institutes** to address risks from advanced AI technologies.

  - **Note: AI Safety institute:** India's Artificial Intelligence Safety Institute (AISI) is set to be run and managed virtually, with a collaboration of industry and academia across the country interacting
- **Artificial Intelligence Action Summit :** It was held in Paris, France, in February 2025. The summit was co-chaired by French President Emmanuel Macron and Indian Prime Minister Narendra Modi.
  - **Aim:** Following the UK (Bletchley Park) and South Korea (Seoul), the Paris Summit aims to further AI governance and collaboration.
  - **Outcome: 58 countries**, including **India, China, Brazil, France, Australia and the European Commission**, signed a joint statement on **"Inclusive and Sustainable Artificial Intelligence for People and the Planet." U.S. and U.K. did not sign the joint statement.**

Global Example

China: Established an **Algorithm Registry**, aiming to monitor and regulate algorithms for safety and alignment.

European Union: Proposed an **AI Office** under its regulatory framework, combining oversight with compliance requirements.

The **International Network of AI Safety Institutes** was inaugurated in November 2024 in San Francisco, U.S., following the Seoul Statement of Intent, under which nations pledged to collaborate on AI safety.

AI regulation in India

- India no law specifically regulating AI.
- Instead, it has focused its resources on a government mission designed to support the development and adoption of AI.
- The IndiaAI mission aims to foster an innovative, skilled, safe, and trustworthy AI ecosystem.

BIMSTEC Traditional Music Festival

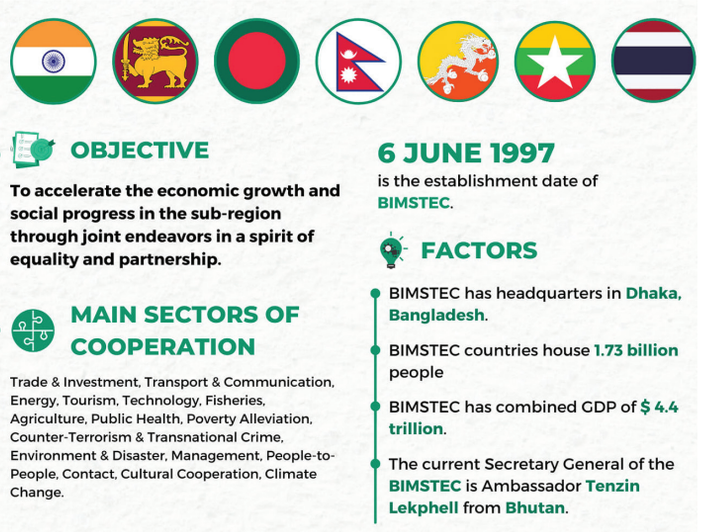
Context

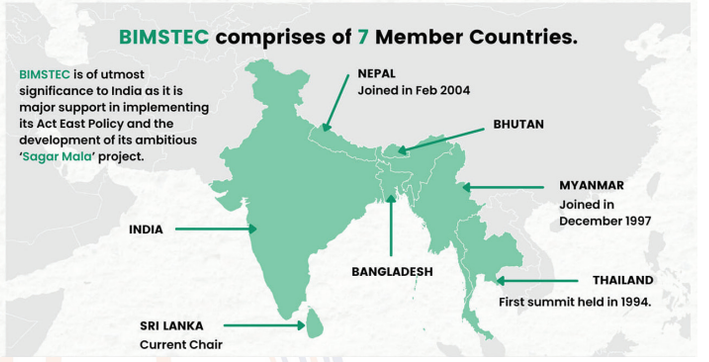
The first-ever BIMSTEC Traditional Music Festival was held in New Delhi at Bharat Mandapam.

Key highlights of the festival

- **Theme:** "Saptasur: Seven Nations, One Melody": The festival's theme celebrated the collective cultural identity of the seven member nations.
- **Genesis:** organized following an announcement by Prime Minister Narendra Modi during the 6th BIMSTEC Summit in Thailand in April 2025.
- **Organised by:** Indian Council for Cultural Relations (ICCR) under the Ministry of External Affairs
- **Diverse music tradition:** Musicians from all BIMSTEC nations showcased a rich variety of traditional, instrumental, and folk music that reflects the soul of South and Southeast Asia.
- **Cultural diplomacy:** It was a significant exercise in cultural diplomacy, emphasizing cultural exchange as a vital component of regional cooperation.

About BIMSTEC





UNHCR

Context

The UNHCR has suspended the repatriation of Sri Lankan Tamil refugees after several returnees were arrested in Sri Lanka on charges of violating immigration laws.

United Nations High Commissioner for Refugees (UNHCR)

- **Role:** Protects refugees worldwide, ensures their safety, and facilitates their voluntary return or resettlement.
- **History:**
  - Established in **1950** by the UN General Assembly after World War II.
  - Created to assist millions displaced by the war.
- **Nature:** A global humanitarian body committed to saving lives, protecting rights, and supporting people forced to flee due to **conflict or persecution**.
- **Awards & Recognition:**
  - Won the **Nobel Peace Prize** in **1954** and **1981**.
  - Introduced the **Nansen Refugee Award (1954)** to honor exceptional service to refugees, displaced, or stateless persons.
- **Headquarters:** Geneva, Switzerland.

Rohingya Refugees

- **Who are they?**
  - A **Muslim minority ethnic group** originally from the **Arakan kingdom (now Rakhine State, Myanmar)**.
  - The term **"Rohang"** derives from Arakan, while ga/gya means "from."
- **Cultural identity:**
  - Distinct from Myanmar's Buddhist majority.
  - Speak a **Bengali dialect**, different from Burmese.
- **Citizenship status:**
  - Myanmar **denies them recognition as an ethnic group**.
  - Citizenship was revoked under the **1982 Myanmar Citizenship Law**.
  - To qualify, they must prove ancestors lived in Myanmar before **1823**.
  - Without this, they are classified as **"resident foreigners" or "associate citizens,"** even if one parent is a Myanmar citizen.

10th anniversary of the Framework Agreement with NSCN-IM

Context

On the 10th anniversary of the Framework Agreement (2015), the NSCN-IM reaffirmed its commitment to defend the accord.

About Framework Agreement

- Signed in August 2015 between the Government of India and NSCN-IM.
- Aimed at **ending the decades-long Naga insurgency**.
- Recognized the **unique history, culture, and identity** of the Naga people.
- Based on the democratic principle that **sovereignty lies with the people**.
- **NSCN-IM gave up the demand** for "Greater Nagaland" (Nagalim) and **accepted the Indian Constitution** and political system.
- The **Government assured** that **existing state boundaries will not change**.
- Full details of the framework agreement are **not yet publicly disclosed**.
- The accord seeks to bring **peace, dignity, development, and equity** to the Naga people. It emphasizes a solution consistent with Naga traditions and aspirations.
- **Implementation Plan:** Promises a time-bound and actionable roadmap, signalling intent to move beyond rhetoric to real autonomy.

Integrated Air Defence Weapon System (IADWS)

Context

India successfully conducted the maiden flight-tests of the Integrated Air Defence Weapon System (IADWS) off the coast of Odisha.

- IADWS is a **layered, network-centric air defence system** integrating **kinetic interceptors** and **directed-energy weapons** under a **Centralised Command and Control Centre (C2C2)**.
- It is designed for **area defence** of **high-value military and national assets**.

Centralised Command and Control Centre (C2C2):

- Integrates **radar** and **electro-optical sensors**.
- Generates a **real-time aerial picture**.
- Allocates threats to the most suitable interceptor based on:
  - Velocity
  - Altitude
  - Radar cross-section
  - Flight path or approach vector

Layered Defence Structure:

- Outer Tier – QRSAM (Quick Reaction Surface-to-Air Missile):
  - Equipped with **active radar homing**.
  - Mounted on **high-mobility launchers**.
  - Targets: Fast aircraft, helicopters, cruise missiles, glide bombs.
  - **Interception range**: 25–30 km
  - **Altitude coverage**: Up to 10 km
  - **Strengths**: High mobility, rapid reaction, broad area coverage.
- Middle Tier – VSHORADS (Very Short-Range Air Defence System):
  - **Shoulder-fired** missiles with **infrared imaging seekers**.
  - Targets: Low-flying UAVs, helicopters, slow fixed-wing aircraft.
  - **Engagement range**: Up to 6 km
  - **Altitude coverage**: Up to 4 km
  - **Strengths**: Point defence, flexibility, ideal for pop-up or terrain-masking threats.
- Inner Tier – DEW (Directed Energy Weapon):
  - High-power **laser system** developed by **DRDO-CHESS**.
  - Optimised for **counter-UAV** roles.
  - **Neutralises drones** by damaging airframes or disabling electronics.

- **Virtually unlimited firing capacity**.
- **Strengths**: Cost-effective, sustained engagements, no reloads required.

Integration & Purpose:

- All layers are unified under the **C2C2**.
- Capable of countering:
  - **Conventional threats**: Aircraft, cruise missiles.
  - **Asymmetric threats**: Drones, swarms, loitering munitions.
- Designed to protect:
  - **Military assets**: Air bases, radars, C2 nodes.
  - **Strategic infrastructure**: Nuclear sites, power plants, industrial hubs.

Agni-5 Intermediate-Range Ballistic Missile

Context

India successfully test-fired the Agni-5 intermediate-range ballistic missile from Chandipur, Odisha.

About Agni-5 Missile:

- It is a variant of the Agni-5 intercontinental ballistic missile (ICBM)
- **Range:** around 7,000 kilometres. However, it is officially described as intermediate-range.
- **Developed by:** Defence Research and Development Organisation (DRDO)
- It is solid-fueled, three-staged, and designed for mobility.
- **Launched:** from hermetically sealed canisters, which protect it from the environment
- **Transport:** by road or rail and fire it at short notice. This makes the system more survivable and operationally flexible.
- **Capability:** carrying both conventional and nuclear warheads.
- **Strategic significance:** give India the ability to deter both Pakistan and China.

Airbus C-295 military transport aircraft

Context

India Receives Final Batch of Airbus C-295 Aircraft Ahead of Schedule in Spain. The delivery came two months ahead of schedule at Airbus's Seville assembly line.

About Airbus C295

- The Airbus C295 is a robust, reliable and highly versatile tactical transport aircraft
- **Use:** troop and cargo transport, maritime patrol, airborne warning, surveillance and reconnaissance, to signals intelligence, armed close air support, medical evacuation, VIP transport and airborne firefighting.
- **Load and speed:** The C295 can carry up to eight tonnes of payload or up to 70 troops at a maximum cruise speed of 260 knots.
- **Altitude:** C295 can cruise at altitudes up to 30,000 ft while maintaining excellent low-level flight characteristics.
- **Takeoff:** short take-off and landing (STOL) performance from unpaved, soft and sand/grass airstrips.

Note: In October 2024, Prime Ministers Pedro Sanchez and Narendra Modi launched the TATA Aircraft Complex in Vadodara, Gujarat, where 40 additional C-295s will be manufactured. A total of 56 aircraft will be delivered under the programme.

India-Philippines Naval Exercise

Context

India and the Philippines conducted their first-ever bilateral joint naval drill in the South China Sea, marking a significant step in maritime cooperation amid regional conflicts.

About the Exercise:

- **Participants:** The Indian Navy deployed three warships, including a guided missile destroyer, a tanker, and a corvette. The Philippines participated with two of their frigates.
- **Objectives:** The exercises aimed to enhance preparedness, build mutual trust, and strengthen operational synergy between the two navies
- **Types of Drills:** The sea phase involved anti-air, anti-surface, and anti-submarine drills.

Significance of the Exercise:

- **First joint naval exercise:** between India and the Philippines, representing a significant milestone in their evolving Indo-Pacific strategy.
- **Strategic Alignment:** driven by shared concerns about China's growing maritime presence and assertiveness in the region.
- **Act East policy:** The exercise is a key element of India's "Act East" policy, strengthening its engagement with Southeast Asian partners
- **Defence Diplomacy:** It will Boosts defence diplomacy and freedom of navigation operations (FONOPs).

Intermediate Range Nuclear Force Treaty

Context

Russia Exits Nuclear Treaty With US After US President Donald Trump ordered two nuclear submarines to "be positioned in the appropriate regions" near Russia.

About NF treaty

- **Signed in 1987** between the **United States** and the **Soviet Union (now Russia)**.
- **Objective**: Both nations agreed to eliminate and permanently forswear all of their nuclear and conventional ground-launched ballistic and cruise missiles with ranges of 500 to 5,500 kilometers.
- The treaty emerged in response to a massive missile build-up by both countries in Europe, which posed a serious threat to continental security.
- After years of negotiations, the agreement was finalized under the leadership of **US President Ronald Reagan** and **Soviet leader Mikhail Gorbachev**.
- **First-of-its-Kind Elimination:** First arms treaty to eliminate an entire class of weapons, not just limit them.
- **Key outcome**:
  - Banned all **ground-launched ballistic and cruise missiles** with ranges between **500 and 5,500 kilometers**.
  - Included mutual **on-site inspections** to ensure compliance.
  - Resulted in the dismantling of **2,619 missiles within three years**.
- **Present Status:** The US withdrew from the Intermediate-Range Nuclear Forces treaty in 2019.

Mission Sudarshan Chakra

Context

Prime Minister Narendra Modi on independence day announced the launch of Mission Sudarshan Chakra, a state-of-the-art defence initiative aimed at bolstering India's security.

About Sudarshan Chakra:

It is a nationwide strategic initiative aimed at building a cutting-edge, multi-tiered security shield to safeguard India's most critical infrastructure and locations.

Objectives

- Establish a fully indigenous, research-driven security network capable of countering threats from **air, land, sea, and cyberspace**.
- Promote **self-reliance (Aatmanirbhar Bharat)** in the development of high-end defence technologies.
- Offer integrated and proactive protection for **strategic assets, major cities, and religious landmarks**.

Key Features

- **Multi-layered Defence System**: Incorporates surveillance, threat detection, interception, and rapid countermeasures.
- **Wide Coverage**: Secures a mix of military, civilian, and sacred sites.
- **Advanced Technologies**: Leverages radars, artificial intelligence (AI)-driven tracking systems, cyber defence tools, and physical security mechanisms.
- **Indigenously Developed**: Entire project is conceptualised, engineered, and manufactured within India.
- **Vision 2035**: A long-term roadmap for system expansion, technology upgrades, and increased coverage by the year 2035.

Strategic Importance

- **Deterrence Capability**: Seen as India's version of a comprehensive defence shield—akin to Israel's Iron Dome, but tailored to India's complex threat environment.
- **Sovereign Autonomy**: Minimises reliance on imported defence systems, enhancing national security and technological independence.
- **Holistic Protection**: Equips the country to handle a wide range of security challenges, including **conventional attacks, hybrid warfare, and cyber threats**.

India's Joint Doctrines for Cyberspace Operations

Context

Chief of Defence Staff (CDS) formally released the declassified versions of the Joint Doctrines for Cyberspace Operations and Amphibious Operations during the Chiefs of Staff Committee meeting.

Key Components and Principles of Joint Doctrine for cyberspace:

- **Unified approach:** It outlines a unified approach to defend national cyberspace interests, integrating offensive and defensive cyber capabilities.
- **Synchronised Operations:** It enables synchronised operations across the three Services.
- **Real-time intelligence:** The doctrine emphasizes the integration of real-time threat intelligence.

- **Legal compliance:** The framework stresses adherence to domestic laws and international cyber norms to ensure legitimacy and credibility.

About the Joint Doctrine for Amphibious Operations

- **Integrated planning:** It defines the framework for planning and executing amphibious operations by integrating maritime, air and land forces.
- **Rapid response:** It stresses interoperability, rapid response capability and joint force application to influence operations ashore.
- **Strategic reach:** The doctrine aims to enhance India's capability to project power over coastal and island territories.
- **Civil-military fusion:** The doctrine stresses coordination with civilian agencies, which is a necessary component for national-level mobilization.

Armenia and Azerbaijan Peace Agreement

Context

Armenia and Azerbaijan signed a US-brokered peace agreement on August 8, 2025, at the White House, mediated by President Donald Trump.

About the agreement:

- **It is a potentially historic turning point** in their decades-long conflict over the Nagorno-Karabakh region.
- The agreement aims to end armed conflict, establish diplomatic relations, foster regional economic prosperity, and open new transportation corridors.

About Armenia–Azerbaijan Conflict

The Armenia–Azerbaijan conflict is a long-standing territorial and ethnic dispute, primarily over the **Nagorno-Karabakh region.**

Nagorno-Karabakh

- **Nagorno-Karabakh** is a landlocked region within **Azerbaijan's internationally recognized borders**, but it has been predominantly populated by **ethnic Armenians.**
- The region declared independence from Azerbaijan in the late 1980s, with **Armenian support**, sparking conflict.

Historical Background

- **During Soviet times:** Nagorno-Karabakh was made an **autonomous oblast (province)** within the Azerbaijan SSR, despite its Armenian-majority population.
- **Late 1980s:** As the Soviet Union began to collapse, ethnic tensions resurfaced. In **1988, Nagorno-Karabakh's local parliament voted to join Armenia.**
- **1991–1994 First Nagorno-Karabakh War:**
  - Full-scale war broke out between Armenia-backed ethnic Armenian forces and Azerbaijan.
  - Resulted in 30,000+ deaths, and Armenians gained control of Nagorno-Karabakh and surrounding Azerbaijani territories.
  - Over 1 million people displaced (mostly Azerbaijanis).
  - A Russia-brokered ceasefire was signed in 1994, but no peace treaty followed.
- **2020 Nagorno-Karabakh War (Second War) 2020**: A 44-day war broke out.
  - Azerbaijan launched a major offensive, backed by Turkey and aided by drone warfare.
  - Azerbaijan recaptured large portions of territory, including key cities like Shusha.
- **September 2023:** Azerbaijan launched a **one-day military operation** to fully retake Nagorno-Karabakh.
- The **Armenian-backed government** of Nagorno-Karabakh surrendered and dissolved **by end of 2023.**
- **Current Status: Nagorno-Karabakh** is now under **Azerbaijani control**, with its **ethnic Armenian population largely displaced.**

POLITY & GOVERNANCE

TOPICS FOR MAINS

Jan Vishwas Bill 2.0

Syllabus Mapping: GS2; Legislature and important aspects of governance

Context

The Jan Vishwas (Amendment) Bill, 2025, known as Jan Vishwas 2.0, was recently tabled in the Lok Sabha.

It aims at strengthening trust-based governance and promoting ease of living and doing business.

Introduction

According to India business corruption survey 2024, about 66% businesses admitted to paying bribes highlighting the systemic nature of corruption. Jan Vishwas bill, 2025 aims to further decriminalize nearly 100 provisions across multiple laws in order to improve the Ease of Doing Business in India.

Need for the Jan Vishwas Bill 2.0

- **Overcriminalisation in Indian laws:** As per the **Vidhi Centre for Legal Policy**, 370 of 882 central laws contain criminal provisions, creating 7,305 offences.
  - Over 75% of these offences fall outside core criminal justice areas, extending instead to domains like shipping, taxation, financial institutions, and municipal governance.
- **Trust based governance**: The initiative marks a shift towards governance rooted in trust, focusing on encouraging compliance through confidence rather than fear of punishment. Its objective is to ease the regulatory burden on businesses.
- **Disproportionate punishments:** Many trivial acts attract severe penalties, violating the principle of proportionality.
  - Eg: Arrest is possible for minor acts such as milking a cow on the street or not exercising a pet dog.
- **Hindrance to business and economic growth: ORF (2022)** found that out of 1,536 business laws, over half include imprisonment clauses.
  - Of 69,233 compliances, 37.8% prescribe jail terms.
  - Such provisions deter entrepreneurship, job creation, and GDP growth.
- **Burden on the judiciary:** According to the **National Judicial Data Grid,** India's district courts currently face 3.6 crore pending criminal cases, with 2.3 crore cases pending for over a year.
  - Minor procedural lapses contribute significantly, clogging courts and delaying justice in serious offences.
- **Attracting investment: According to an EY-FICCI survey,** 4 out of 5 respondents believe corruption discourages foreign direct investment (FDI). Strengthening compliance mechanisms can enhance India's appeal to global investors.
- **To maintain economic competitiveness**: The document cautions that India may lose investment and talent to more business-friendly destinations, such as the United States, which is actively pursuing governance reforms.

Key Features of the Jan Vishwas 2.0 Bill

- **Relief for First-time Offenders**: Introduces warning and improvement notices for 76 offences across 10 Acts.
  - **Eg: Under the Weights and Measures Act**, a violation earlier attracted a ₹1 lakh penalty; now, an improvement notice with a rectification period will be issued.
- **Removal of Imprisonment Clauses**: Minor procedural or technical defaults will no longer lead to jail terms.
  - **Eg: Under the Electricity Act 2023**, the proposed change replaces a three-month imprisonment with a monetary fine ranging from ₹10,000 to ₹10 lakh.
- **Rationalisation of Penalties**: Automatic 10% increase in fines every three years ensures deterrence without frequent legislative amendments.
  - The focus shifts from incarceration to financial penalties.

Government's rationale

- Reinforces the philosophy of "minimum government, maximum governance."
- In line with Make in India, Ease of Doing Business, and judicial reforms targets.
- Aims to eliminate outdated laws that criminalise minor or technical lapses.

Challenges associated with Jan Vishwas Bill 2.0

- **Limited Scope:** Although the bill proposes to decriminalize about 100 provisions, more than 20,000 provisions with imprisonment clauses remain untouched.
  - This indicates the reforms may be too narrow to create large-scale impact.
- **Slow Pace of Reform:** Compliance reforms were initiated two years ago, but progress has been sluggish, raising doubts about timely implementation.
- **Persistence of Systemic Corruption**: Decriminalization alone may not tackle deep-rooted corruption.
  - Officials often misuse compliance provisions to extract bribes, and businesses still report paying "unofficial fees" despite fulfilling compliances.
- **Regulatory Overload & Chaos**:With 9,420 compliance updates in the past year (around 36 changes daily), businesses face instability.
  - Decriminalization of some provisions does not solve the underlying problem of excessive and constantly changing regulations.
- **Global Competitive Pressure:** Countries like the US are advancing reforms to make their business environments more efficient.
  - India's reforms need to be bold and comprehensive to maintain global competitiveness.
- **Implementation Challenges at State Level**: Pending execution of labour codes reflects gaps between Union and State-level enforcement, hinting at difficulties in rolling out Jan Vishwas 2.0 uniformly.
- **Clarity & Transparency Issues:** Ambiguities in provisions may lead to arbitrary interpretations by officials, recreating compliance hurdles the bill intends to reduce.
- **Impact on Worker Rights:** Decriminalizing labour law violations could weaken worker protections, raising concerns of potential exploitation.
  - Safeguards must ensure reforms do not compromise worker rights.
- **Neglect of the Informal Sector**: The bill largely focuses on the formal sector, leaving the vast informal sector unaddressed.
  - This risks widening disparities and leaving a majority of small businesses outside reform benefits.

Way Forward

- **Comprehensive Decriminalization**: Extend reforms beyond Jan Vishwas 2.0 to cover over 20,000 provisions with imprisonment clauses.
- **Unified Business Identity**: Introduce a "One Nation, One Business" identity system to replace the existing 23+ separate identifiers.
- **Digital First Compliance:** Adopt secure digital solutions such as a DigiLocker-based system for document verification and compliance tracking.
- **Predictable Regulatory Framework:** Mandate that all regulatory bodies update compliance requirements only once annually, ensuring stability and predictability.
- **Labour Code Implementation**: Operationalize the four modern labour codes that currently remain pending.
- **Inspector Accountability**: Reduce discretionary powers of inspectors by introducing clear accountability mechanisms.
- **Budgetary Support for Digital Integration**: Allocate sufficient resources to modernize and digitally integrate business compliance systems.

Conclusion

The Bill is currently under review by a Select Committee of the Lok Sabha, with its report expected in the next parliamentary session. If enacted, Jan Vishwas 2.0 could reduce judicial pendency, improve citizen–state trust, and strengthen India's reputation as a business-friendly destination.

Bill on Ministerial removal over criminal charges

Syllabus Mapping: GS2, Executive, Corruption

Context

The Central Government has tabled the 130th Constitution (Amendment) Bill, 2025 in the Lok Sabha, proposing the removal of Union and State Ministers who remain under arrest for 30 consecutive days on serious criminal charges.

Key features of the 130th Constitution (Amendment) Bill, 2025

Proposed Amendments

- Seeks changes to the Constitution, relating to:
  - **Article 75:** Union Council of Ministers
  - **Article 164**: State Councils of Ministers
  - **Article 238AA:** Ministers in Union Territories (including Delhi)

Key Provisions

- **If a Minister remains in custody for 30 consecutive days:**
  - The Prime Minister/Chief Minister must recommend their removal on the 31st day.
  - Failing this, the Minister will automatically cease to hold office from the next day.
- **At different levels:**
  - **Union level** → The President acts on the Prime Minister's advice.
  - **State level** → The Governor acts on the Chief Minister's advice.
  - **Delhi** → The President acts on the Chief Minister's advice.
- If the Prime Minister or a Chief Minister (including Delhi) is in custody for 30 consecutive days, they must resign by the 31st day or automatically lose office thereafter.
- Removal is reversible once the Minister/PM/CM is released from custody.

Objective

- To uphold constitutional morality and strengthen good governance.
- To ensure that Ministers facing serious criminal charges cannot continue in office, thereby maintaining public trust and integrity in government

Criminalisation of politics

Reasons behind criminalisation of politics

Political

- **Use of money and muscle power**: To buy votes criminals provide tons of money and supporting hand to fulfill other illegitimate purposes of parties.
- **Intra Party Democracy is weak**: No regulation to restrict criminals from entering political parties- he may be disqualified to be a legislator but he may continue to hold position within his party.

Legal

- **Gap between voter and EC:** People lack awareness of the rule of EC, MCC is openly flouted without stringent punishments.
- **Toothless laws:** Laws are not stringent to prevent convicted criminals from standing for election.

Economic

- **Black money in elections:** Electoral politics is largely dependent on the money, since candidates with criminal records often possess greater wealth, they ensure greater inflow of money.

Administrative

- **Loopholes in the functioning of EC:** The BC has prescribed the contestants to disclose their property details, cases pending in courts, convictions etc. However, these steps have not been stringent enough to break the nexus between crime and politics.
- **Corruption**: Institutionalisation of corruption is an ongoing process in our politico-administrative system.

Ethical

- **Lack of ethics and values**: Lack of ethics and values in Indian politics further accentuates the problem of criminalization with the urge to win by hook or crook.

Impact of criminalisation of politics

Political

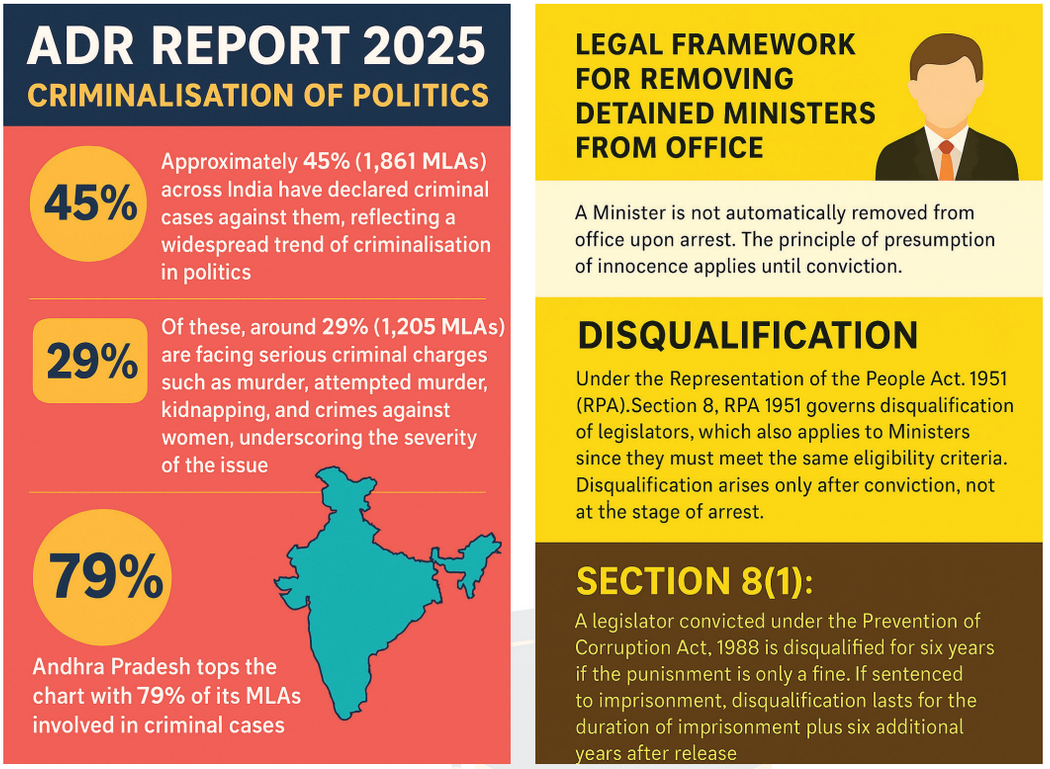
- **Affect goodwill of parliament:** Sanctity of parliament undermines as law breakers become law makers.
- **Bad decision making in Parliament**: One can't even expect good decisions or good work from the people elected with money & muscle power.
- **Domino effect:** Because the focus of the party is on winning, they tend to include more and more influential elements, hence it perpetuates criminalization of politics.
- **Decrease in Democratic Value:** This disrupts the constitutional ethos, threatens parliamentary democracy and deterioration of democratic values.

Governance

- **Favoritism and Nepotism:** Criminal persons enter into Parliament, they start influencing administration and governance and indulge in nepotism, supporting corrupt practices.
- **Affect judiciary**: Often MPs and MLAs find loopholes to save themselves from judicial pronouncements that will affect people's faith in judiciary.

Social

- **Causes Social Disharmony:** It introduces a culture of violence in society and sets a bad precedent for the youth to follow and reduces people's faith in democracy as a system of governance.
- **Increase in Crime against Women** : As many as 76 lawmakers across the country have declared cases related to crimes against women.
- **Promote criminal attitude:** Weak enforcement of rule of law and will increase in social divisions.
- **Undermine electoral culture**: Bad administration affects the enthusiasm of voters to vote in the next election



Judicial pronouncements regarding ministerial accountability

- **V. Senthil Balaji Case (2025):** The Supreme Court directed **Tamil Nadu Minister V. Senthil Balaji** to choose between remaining in office or retaining personal liberty, after observing that the Court had been misled by his reappointment following grant of bail in the cash-for-jobs scam.
  - Balaji subsequently resigned from office, though his bail continued.
- **Arvind Kejriwal Case (2024):** In the Delhi liquor policy money laundering case, the Supreme Court granted bail to former Delhi CM Arvind Kejriwal.
  - While the Court barred him from discharging official duties, it held that it could not compel his resignation as Chief Minister. He later resigned voluntarily from the post.
- **Justice R.F. Nariman:** On 13th Feb 2020 Justice Nariman ordered the political parties to publish criminal antecedents of their candidates for the Legislative Assembly and LS elections.
- **Fast Track courts:** In 2015 the SC had directed the Centre to set up special fast-track courts to exclusively try lawmakers and politicians facing criminal cases.
  - In 2017, the centre informed the SC that it has decided to set up 12 special courts throughout the country to exclusively deal with 1581 criminal cases pending against MPs and MLAs within a year.
- **PUCL v. Union of India:** In its 2013 judgement, SC upheld the constitutional right of citizens to cast a negative vote in elections. The famous order to introduce None of the above NOTA.

Significance of Ministerial Accountability in India

- **Constitutional Principle of Collective Responsibility:** Under Articles 75(3) and 164(2), the Council of Ministers is collectively responsible to the Lok Sabha and State Legislative Assembly respectively. This ensures that decisions are taken jointly, and the Cabinet stands or falls together.
  - **Eg:The resignation of Prime Minister Morarji Desai in 1979** after losing a no-confidence motion reflects how collective accountability operates in practice.
- **Preserving Democratic Legitimacy:** Accountability reinforces the idea that Ministers hold office in trust for the people and must justify their actions to elected representatives. Without it, governance risks sliding into arbitrariness.
  - **Eg: In the 2G Spectrum Scam (2010), the resignation of Telecom Minister A. Raja** under public and parliamentary pressure showed how accountability protects democratic legitimacy even before judicial conviction.

- **Ensuring Ethical Governance:** Ministerial accountability acts as a safeguard against corruption, nepotism, and misuse of authority. It upholds constitutional morality in governance.
  - **Eg: In Manoj Narula v. Union of India (2014)**, the Supreme Court emphasised that while law does not bar Ministers with criminal cases, constitutional morality demands that the Prime Minister avoid appointing tainted individuals.
- **Transparency in Governance:** Regular disclosure of assets, liabilities, and pending cases promotes public trust and curbs conflicts of interest.
  - **Eg: Following the Association for Democratic Reforms (2002) judgment,** Ministers and MPs must file affidavits declaring criminal and financial records, empowering citizens to make informed judgments about their representatives.
- **Strengthening Parliamentary Oversight:** Parliamentary devices like Question Hour, CAG reports, and Standing Committees act as accountability mechanisms, compelling Ministers to justify policy choices and expenditure.
  - **Eg: The exposure of irregularities in the Bofors Scandal (1980s)** through parliamentary debate eventually led to the downfall of the Rajiv Gandhi government in 1989.
- **Maintaining Public Confidence:** Ministers are symbols of public trust. Resignations or dismissals in cases of misconduct preserve the credibility of governance and reinforce citizens' faith in institutions.
  - Eg: In 2015, several Bihar Ministers were dropped by CM Nitish Kumar after media scrutiny of their criminal antecedents, showing how accountability helps retain legitimacy.

Ways to strengthen ministerial accountability

1. Strengthening Legal and Constitutional Provisions

- **The 170th Law Commission Report (1999)** recommended disqualification of legislators at the stage when charges are framed for offences punishable with five years or more, with the disqualification lasting for five years or until acquittal, whichever is earlier.
- **The 244th Law commission report (2014)** suggested that disqualification should occur upon framing of charges by a court, as this indicates judicial satisfaction that there is sufficient evidence to proceed to trial.

2. Ensuring a Transparent Appointment Process

- Political parties must exercise due diligence in nominating individuals for ministerial positions, avoiding candidates with criminal antecedents.
- Formulate guidelines for the Prime Minister and Chief Ministers to ensure that integrity, probity, and public trust are prioritised in ministerial appointments.

3. Enhancing Parliamentary Oversight

- Strengthen the role of parliamentary committees and ethics panels to regularly monitor the conduct of Ministers.
- Make it mandatory for Ministers to file periodic disclosures of assets, liabilities, and pending criminal cases, ensuring greater transparency and enabling effective parliamentary scrutiny.

4. Promoting Ethical Governance and Codes of Conduct

- Implement a binding Ministerial Code of Conduct that lays down principles of transparency, accountability, integrity, and service to the public.
- Encourage political parties to adopt internal accountability mechanisms and actively enforce ethical standards among their members in executive office.

Ethics and Politics

(A broader reflection)

'Politics without principles is a sin'. - Mahatma Gandhi

- **Ethics** refers to the moral principles and values that guide individual behaviour and decision-making.
- **Politics** refers to the process of governing and making decisions that affect society as a whole.

Ethics as an integral part of politics

- **Responsibility and Accountability:** Political leaders are not hesitating in taking the responsibility of their office. This is an integral part of ethical ideals.
  - **Eg: Former Railway minister Lal Bahadur Shastri** resigned after a railway accident taking full responsibility.
- **Human rights advocacy:** Political leaders often advocate for human rights based on ethical principles of dignity, equality and justice.
  - **Eg: Civil rights movement in the US led by Martin Luther king jr.** was rooted in ethical imperatives for equality, justice and human dignity. His moral convictions, demonstrating that ethical principles can be powerful drivers in political movements.

- **Non-violence:** Mahatma Gandhi's leadership during India's freedom struggle was deeply intertwined with ethical principles of non-violence, truthfulness and social justice. His commitment to these ethical values shaped India's way to freedom.
- **Democratic governance:** Democratic politics is grounded in ethical principles of participation, representation and rule of law.

Ethics and politics are antithetical

- **Realpolitik:** In many political contexts, expediency and pragmatism sometimes overshadow ethical considerations.
  - **Eg:** Culture of coalition government in India.
- **Dilemmas in politics:** In the pursuit of political objectives, leaders and policy makers may face dilemmas where they must balance competing interests and make choices that may challenge ethical ideals.
  - **Eg:** Dilemma of Partisan politics v/s Bipartisanship
- **Use of tactics:** Politics is often said to have Machiavellian tactics such as deception, hate mongering, propaganda etc. which often ignores the ethical principles in search of power.
  - **Eg:** Populist appeals, case of electoral bonds

Conclusion

In the words of the **former President Dr Rajendra Prasad**: "If the people who are elected are capable and men of character and integrity, then they would be able to make the best even of a defective constitution. If they are lacking in these, the Constitution cannot help the country".

Online Gaming Act, 2025

Syllabus Mapping: GS2: Legislature

Context

The Indian Parliament has enacted the Online Gaming Act, 2025, a landmark move to regulate the fast-expanding digital gaming sector.

Introduction

The legislation seeks to balance innovation in e-sports and casual gaming with the need to curb the social and economic risks posed by **Real Money Games (RMGs)**. According to government estimates, Indians lose nearly ₹15,000 crore annually on such platforms. The Act was introduced against the backdrop of growing concerns over addiction, suicides, financial fraud, and tax evasion linked to online money gaming.

Key Provisions of the Online Gaming Act, 2025

1. **Classification of Online Games:** The Act categorises online games into three distinct types:
   - **E-Sports:** Games formally recognised under the National Sports Governance Act, 2025. These include competitive skill-based video games with performance-linked prize pools (Eg: Call of Duty, Grand Theft Auto)
   - **Social Gaming**: Recreational or educational games played primarily without monetary stakes. The Act promotes their growth through government incentives and budgetary support.
   - **Real Money Games (RMGs**): Games involving monetary stakes, credits, or convertible tokens (Eg: Poker, Rummy, Fantasy Cricket, Ludo variants). These are **completely banned under the Act**.
2. **Prohibition on RMG-Related Activities:** A blanket ban applies to advertisements, celebrity endorsements, and platforms offering RMGs.
   - This measure follows concerns about the undue influence of celebrities, many of whom had previously promoted such platforms, especially on youth.
3. **Penalties and Enforcement**
   - **Illegal operation or facilitation of RMGs:** Punishable with up to 3 years' imprisonment, or a fine of ₹1 crore, or both.
   - **Unlawful advertisements and endorsements:** Punishable with up to 2 years' imprisonment, or a fine of ₹50 lakh, or both.
     - Offences are designated as cognisable and non-bailable under the **Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023**
   - **Enforcement mechanisms: CERT-IN (Indian Computer Emergency Response Team)** empowered to block or disable non-compliant apps.
     - International collaboration with Interpol to clamp down on offshore operators evading Indian laws.
4. **Rationale for the Legislation: The Act addresses a series of growing concerns:**
   - **Addiction and Suicides:** WHO links RMGs with compulsive behaviour; Karnataka reported 32 gaming-related suicides in 31 months.

- **Financial Fraud:** Chinese app FIEWIN defrauded Indians of nearly ₹400 crore, as per Defence Ministry findings.
- **Tax Evasion:** Gaming firms reportedly evaded ₹30,000 crore in GST and ₹2,000 crore in income tax.
- **Money Laundering & Terror Funding**: A 2023 Parliamentary Panel identified online gaming portals as potential channels for terror financing.

Factors Driving the Growth of the Gaming Industry in India

Technological enablers

- **Improved Internet Infrastructure:**
  - **Initiatives like BharatNet and the National Broadband Mission (NBM)** are expanding high-speed internet access to rural and remote regions.
  - The 5G rollout has enhanced connectivity with faster speeds and lower latency, crucial for seamless gaming experiences.
  - **As per Mordor Intelligence (2023),** India's gaming market, valued at USD 2.2 billion in 2023, is projected to grow to USD 8.6 billion by 2028 at a CAGR of 27.4%.
- **Affordable Smartphones and Data:**
  - Over 85% of Indian households own smartphones, and 86.3% have internet access within premises **(MoSPI data)**
  - Mobile phones account for 90% of India's gaming market, compared to 37% in the US and 62% in China, making mobile gaming the industry's backbone.
- **Emerging Technologies:**
  - Integration of AR, VR, blockchain, and cloud gaming has enhanced user experience and created new opportunities for innovation.
  - **The AR/VR market in India is projected to grow at a CAGR of 9.74% by 2029.**

Policy and cultural shifts

- **Government Support & Regulation:**
  - Frameworks like the IT Rules 2021 provide oversight on harmful content and addiction.
  - Establishment of self-regulatory bodies and the AVGC Promotion Task Force supports structured industry growth.
  - Initiatives such as Create in India and recognition of gamers at the Content Creators Award reflect rising state support.
- **Cultural Transformation:**
  - The Covid-19 lockdown accelerated gaming adoption, with industry turnover growing 50% during the period.
  - Average daily gaming time rose from 2.5 hours pre-Covid to 4.1 hours, positioning gaming as a mainstream form of entertainment and even a career choice.
- **Rise of E-Sports:**
  - E-sports gained recognition as a medal event at the Commonwealth Games 2022 and the Asian Games.
  - Indian teams' success on global platforms has inspired youth participation and legitimised gaming as a professional pursuit.
  - Events like DreamHack Hyderabad 2024 have boosted the competitive gaming ecosystem domestically.

Economic drivers

- **Startup Ecosystem & Investment Inflow:**
  - Start-up India and Atmanirbhar Bharat initiatives have nurtured a vibrant ecosystem of gaming companies.
  - India has produced gaming unicorns like Games24x7, Dream11, and MPL, showcasing rapid sectoral growth.
  - In recent years, Indian gaming firms raised USD 2.8 billion in funding, representing 3% of total startup investments.
  - Government support through Software Technology Parks of India (STPI) further aids industry expansion.
- **Foreign Direct Investment (FDI):**
  - 100% FDI allowance in gaming has attracted major international investors.
  - Global tech giant NVIDIA has announced the launch of its cloud gaming service in India (Nov 2025), reflecting growing foreign interest in the market.

Concerns Related to the Gaming Industry in India

Regulatory Ambiguity and Fragmented Policies

- India lacks a unified and comprehensive regulatory framework, creating confusion for industry stakeholders.
- **State-level variations deepen this fragmentation:**
  - **Telangana**: Complete ban on online gaming.

  - **Andhra Pradesh**: Ban on online gambling.
  - **Tamil Nadu**: Prohibition of Rummy and Poker.
  - **Karnataka**: Considering Chhattisgarh's model—allowing skill-based games but banning betting and chance-based games.
- The absence of a clear distinction between skill-based gaming and gambling adds to legal ambiguity, ethical debates, and inconsistent interpretations.

Regulation of Online Gaming Industry in India

Online Gambling and Money Laundering Risks

- Weak regulation has enabled the rise of illegal offshore gambling markets, causing revenue loss and user harm.
- Online gambling can be a channel for money laundering, where players deposit illicit funds and withdraw them in "legitimate" form.
- **UNODC's 2021 Global Report:**
  - **Illegal betting market** ≈ USD 350 billion
  - **Illegal gambling market** ≈ USD 1.7 trillion
- **Parliamentary Standing Committee (59th Report)** warned that illegal betting apps pose national security risks through opaque payment routes, misuse of the Liberalised Remittance Scheme (LRS), and links to criminal financing.

Rising Gaming Addiction and Psychological Impact

- Online games manipulate the brain's reward system, creating cycles of euphoria and compulsive "chasing losses."
  - Consequences: financial ruin, psychological distress, suicidal tendencies.
- Nationwide findings:
  - 23% of youth report stress and negative thoughts due to gaming.
  - 87% of students play online games regularly.
- The Promotion and Regulation of Online Gaming Bill, 2025 aims to address these issues, but challenges remain in ensuring safe and responsible gaming environments.

Cybersecurity Threats

- Gaming platforms collect sensitive user data (personal and financial), exposing players to risks of identity theft and data breaches.
- Players also bypass restrictions using VPNs and geo-blockers, increasing exposure to unsafe, illegal platforms.
- In 2024, more than 11 million gaming account credentials were leaked in breaches, underlining the industry's cyber vulnerability.

Financial Risks for Consumers

- Vulnerable groups face debt, economic distress, and financial exploitation due to excessive in-game spending.
- Collective losses: About 45 crore Indians lose ₹20,000 crore annually on real-money gaming platforms.

Taxation and Sustainability Challenges

- The **imposition of 28% GST** on the full face value of bets has raised sustainability concerns.
- High tax burdens may push smaller startups out of business and stifle innovation and hinder industry expansion.
- Long-term viability of the sector depends on balancing tax revenues with industry growth.

Measures Needed to Strengthen the Online Gaming Industry in India

Strengthening Regulation and Governance

- A comprehensive central regulatory framework is urgently required to replace the current fragmented state-level bans, given the cross-border nature of the internet.
- Establish a central regulatory authority (similar to the UK model) to standardise rules and bring clarity.
- Strengthen self-regulatory bodies (SRBs) under the IT Rules, 2023, ensuring effective oversight.
- Introduce strict controls on real-money gaming (RMG) through:
  - Age-gating mechanisms
  - Spending limits and self-exclusion tools
  - Robust age verification systems

Creating a Whitelist for Safer Consumer Engagement

- Develop a whitelist of licensed RMG operators and update it regularly.
- Ensure that ISPs, payment gateways, and hosting providers serve only compliant operators.
- Benefits:
  - Prevents access to illegal or fraudulent sites.
  - Enhances consumer safety and market transparency.
  - Builds trust by ensuring only fair and legal platforms operate.

Combating Illegal Gambling and Money Laundering

- Strengthen collaboration between banks, payment gateways, and regulators to:
  - Block financial transactions linked to unlicensed operators.
  - Develop real-time monitoring systems to detect suspicious transactions.
- Enforce strict compliance with Anti-Money Laundering (AML) norms.

Enhancing Cybersecurity and Data Protection

- To tackle rising cyber threats, adopt a multi-layered cybersecurity strategy that includes:
  - Regular system audits and vulnerability testing.
  - Multi-factor authentication and strong encryption.
  - Advanced intrusion detection systems.
- Platforms should collaborate with financial institutions for secure transactions and with cybersecurity experts for ongoing system resilience.

Developing Gaming Hubs and Incubators

- Establish dedicated gaming hubs and incubators in key Indian cities to foster innovation and entrepreneurship.
- These hubs should provide:
  - Modern infrastructure for game development.
  - Mentorship and training programs for startups and professionals.
  - Networking opportunities with global gaming leaders.
- Inspiration can be drawn from international models such as:
  - **Montreal Gaming Hub (Canada).**
  - **Singapore Game Incubator**
  - **South Korea's G-STAR ecosystem.**

Conclusion

The **online gaming industry, as a sunrise sector in India,** offers immense opportunities but also presents serious regulatory, social, and economic challenges. A balanced approach through **GAME – Governance, Awareness, Monitoring, and Engagement** can ensure responsible growth. By creating clear regulations, promoting public awareness, strengthening monitoring mechanisms, and fostering stakeholder collaboration, India can develop a secure and transparent gaming ecosystem.

Legal Aid and NALSA

Syllabus Mapping: GS2: Judiciary

Context

According to the **India Justice Report 2025,** only 15.5 lakh people accessed legal aid in 2023–24, even though nearly 80% of India's population is eligible. This highlights continuing challenges in the reach, budget utilisation, and service quality of the National Legal Services Authority (NALSA)

Introduction

Article-39 A of the Constitution provides for **free legal aid for all**. The **Preamble of the Constitution** also provides for socio-economic and political justice. To uphold these values of equality and justice, the Legal Services Authorities Act,1987 established the **National Legal Services Authority (NALSA)**

About Legal Aid and NALSA

What is NALSA?

- The National Legal Services Authority (NALSA) is the apex statutory body created under the Legal Services Authorities Act, 1987.
- It is responsible for providing free and competent legal services to weaker sections of society.
- Established: 1995
- Patron-in-Chief: Chief Justice of India

Powers and Functions

- Formulates policies and principles for legal aid delivery across India.
- Supervises and funds State Legal Services Authorities (SLSAs) and District Legal Services Authorities (DLSAs).
- Organises Lok Adalats, legal awareness programmes, and supports Alternative Dispute Resolution (ADR).
- Ensures legal aid to eligible persons under Section 12 of the Act, including:

Role of NALSA in rendering free legal aid in India

- **For prisoners and undertrials:** Legal aid counsel is provided in most of the courts for immediate legal assistance.
  - **Eg:** For legal awareness among prisoners "**Haq Hamara bhi to hai campaign"** was launched by NALSA.

- **For Gender Justice:** NALSA has been working towards providing assistance to marginalised groups including women and children and also promotes gender equality in India.
  - **Eg:** Assistance to women in cases of domestic violence during lockdown **(National Legal Aid Helpline-15100),** legal services for transgender rights (**NALSA Judgement, 2014).**
- **For senior citizens:** To make justice accessible for senior citizens, NALSA provides legal services to them.
  - **Eg:** As per Annual Report of NALSA, nearly **1,04,084 senior citizens** were assisted through legal services in 2020.
- **Legal Awareness:** NALSA works for legal awareness through legal literacy programmes and school legal literacy clubs.
  - **Eg: Nyaya Deep** (official newsletter of NALSA) and **Legal Services Week** work towards widening legal awareness.
- **Alternative Dispute Resolution Mechanism:** NALSA encourages the use of alternative dispute resolution mechanisms to resolve disputes outside the courtroom.
  - **Eg:** Initiatives like **Lok Adalats, DISHA (Designing Innovative Solutions for Holistic Access to Justice), e-lok adalats, Legal Services Mobile Apps and Legal Aid clinics.**

Challenges faced by NALSA in ensuring Free Legal aid for all

- **Lack of acceptability of Alternate Dispute Resolution:** As highlighted by former CJI, the Legal Services Authority handles just 1% of the litigation.
- **Low awareness:** Majority of poor and illiterate people are unaware of the basic constitutional and legal rights.
- **Low Fund Utilisation:** Expenditure efficiency declined from 75% to 59%, largely due to stringent spending restrictions.
- **Inadequate Budgetary Support**: Legal aid receives less than 1% of the overall justice budget, with NALSA's allocation falling from ₹207 crore (2017–18) to ₹169 crore (2022–23)
- **Inadequate powers to Lok Adalats:** No specific powers to penalise parties for non-compliance, Lok Adalats hold limited powers compared to civil courts.
- **Centralised Financial Control**: State Legal Services Authorities (SLSAs) require prior approval for routine expenses such as staff recruitment and outreach activities.
- **Underutilization of para-legal volunteers (PLVs):** There is a lack of proper training and capacity building, monitoring and accountability measures for legal volunteers.
  - **Eg:** The PLVs reduced by 38% between 2019 and 2024, while many States continue paying honorariums below minimum wage.
- **Support from advocates and lawyers:** Lack of interest shown by lawyers in pro-bono cases.

Way Forward

- **Enhance Fiscal Support**
  - Earmark at least 2–3% of the overall justice budget for legal aid.
  - Provide greater financial flexibility to enable timely and need-based expenditure.
- **Revitalise the PLV Network**
  - Guarantee a minimum honorarium aligned with wage standards.
  - Institutionalise periodic training for skill upgradation.
- **Decentralise Governance**
  - Empower District Legal Services Authorities (DLSAs) with operational autonomy.
  - Enable quick fund utilisation at the grassroots level without procedural delays.
- **Leverage Digital Tools**
  - Establish a national digital portal for real-time tracking of legal aid services.
  - Monitor pendency, beneficiary outreach, and accountability indicators.
- **Scale Successful Models**
  - Expand the Legal Aid Defence Counsel (LADC) system and strengthen Lok Adalats.
  - Conduct independent evaluations to identify gaps and replicate best practices in underserved regions.

Conclusion

Though NALSA is making persistent efforts in providing free legal services to marginalized communities, for a large number of unprivileged communities justice is still a distant dream. Hence,collaborative approach of government institutions and civil society will help in bridging this gap and ensuring **Nyaya Sabke Liye (Justice for all)**

IRDAI

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

Context

The assistant manager with Insurance regulatory and development authority of India (IRDAI) has been recently booked by the Economic Offence Wing (EOW) of Cyberabad police for allegedly siphoning off over Rs 5.3 crore from the regulator's coffers over a nine month period.

Introduction

The Insurance Regulatory and Development Authority of India (IRDAI), established under the IRDA Act, 1999, is the apex statutory body for regulating, promoting, and ensuring orderly growth of the insurance sector in India. As an autonomous entity, it is tasked with safeguarding policyholders' interests while balancing the sector's commercial viability.

About IRDAI

- **Headquarters**: Hyderabad, Telangana

Genesis

- Established on the recommendations of the **Malhotra Committee.**
- Constituted as an autonomous body in 1999 and later given **statutory status in 2000 under the Insurance Regulatory and Development Authority Act, 1999.**

Objectives

- Ensure the orderly growth of the insurance industry.
- Facilitate speedy settlement of genuine claims.
- Provide an effective grievance redressal mechanism.
- Strengthen the three pillars of the insurance ecosystem:
  - Insurance customers
  - Insurance providers
  - Insurance distributors

Ministry: IRDAI functions under the Ministry of Finance

Composition

- A 10-member authority comprising:
  - 1 Chairman
  - 5 Full-time Members
  - 4 Part-time Members

Role of IRDAI

- Grant, renew, modify, suspend, or cancel certificates of registration for insurers.
- Protect the interests of policyholders.
- Adjudicate disputes between insurers and intermediaries.
- Promote and regulate professional organisations connected with insurance and reinsurance.

Major Initiatives by IRDAI

Bima Sugam

- An online insurance marketplace for buying, selling, servicing policies, and settling claims.
- Forms part of IRDAI's Bima Trinity, which includes:
  - **Bima Vistar**: Comprehensive policy which covers life, health, property and accidents.
  - **Bima Vahak:** Women-centric workforce operating at Gram Sabha level to educate women about benefits of comprehensive insurance.
  - **Bima Sugam**

Saral Jeevan Bima

- A simple and affordable insurance plan designed to provide basic protection.
- Specifically targeted at self-employed individuals and those from low-income groups.

Integrated Grievance Management System (IGMS)

- A centralised platform for grievance redressal across the country.
- Maintains a repository of complaints and facilitates data analysis to identify policyholder concerns.

Pan-India Survey on Insurance Awareness

- Conducted in collaboration with the National Council of Applied Economic Research (NCAER).
- Aims to assess awareness levels and refine strategies for enhancing insurance literacy.

Mandating Board-Approved Awareness Policy for Insurers

- Insurers are required to have a Board-approved Insurance Awareness Policy.
- Must include an action plan for activities promoting consumer awareness on different aspects of insurance.

Regulatory Governance Reforms by IRDAI (2024)

- **IRDAI (Insurance Products) Regulations, 2024**
  - Consolidates 6 earlier regulations into a single framework.
  - Objectives:
    - Enable insurers to adapt quickly to evolving market needs.
    - Improve the ease of doing business.
    - Enhance insurance penetration across the country.
- **IRDAI (Corporate Governance for Insurers) Regulations, 2024**
  - Establishes a robust governance framework for insurers.
  - Clearly defines the roles and responsibilities of the Board and management.
- **IRDAI (Registration, Capital Structure, Transfer of Shares & Amalgamation of Insurers) Regulations, 2024**
  - Integrates 7 previous regulations into a comprehensive framework.
  - Objectives:
    - Simplify processes related to registration, capital structure, and amalgamation.
    - Foster growth and stability in the insurance sector.

Role of IRDAI as an autonomous body regulating and promoting the insurance sector

- **Regulator of the Insurance Sector:** Frames regulations for insurers, intermediaries, and products under Section 14 of the IRDA Act. Issues licenses, prescribes solvency margins, and enforces compliance with guidelines.
  - **Eg: In 2020, IRDAI introduced Arogya Sanjeevani** (Standard Health Insurance Product) to ensure a uniform health policy for all insurers.
- **Promoter of Market Development:** Encourages competition, innovation, and penetration of insurance products, particularly in rural and underserved areas. Facilitates entry of private players since liberalisation in 2000.
  - **Eg: Allowing 100% FDI in insurance intermediaries (2020)** and raising **FDI cap in insurance companies to 74% (2021)** enhanced foreign investment and technology infusion
- **Protector of Policyholders Interests:** Mandates fair disclosure, grievance redressal, and supervises the Integrated Grievance Management System (IGMS) and the Insurance Ombudsman mechanism.
  - **Eg: IRDAI's 2023** direction for faster claim settlement in natural disaster-hit regions (Like floods in Himachal Pradesh) ensured timely relief to affected policyholders.
- **Government Oversight:** Functions as an autonomous statutory body, but the central government retains powers to issue directions in public interest.
  - **Eg: During COVID-19, IRDAI independently directed insurers to launch Corona Kavach and Corona Rakshak policies**, aligning with government health priorities but without direct political interference.
- **Technology Adoption and Digital Supervision**: Promotes InsurTech adoption, e-KYC, and online policy issuance to increase efficiency and transparency.

  - **Eg: Launch of the Bima Sugam digital marketplace** (2024-25) to serve as a one-stop platform for policy purchase, servicing, and claims.
- **Risk-Based Supervision and Market Stability**: Monitors insurers' financial health via solvency ratios, stress testing, and investment norms to prevent systemic risks.
  - **Eg: In 2021, IRDAI restricted Reliance Health Insurance** from selling new policies due to solvency concerns, protecting policyholders from potential default.

Limitations of IRDAI

- **Low insurance penetration**: In India remains low (4.2% of GDP in 2021) vs. the global average of ~7%, indicating limited success in deep rural outreach.
- **Low financial literacy:** Misconceptions about insurance—especially prevalent in rural regions—diminish its perceived necessity.
- **Limited Non-Life Expansion**: Non-life penetration stagnates at 1%, far below the global benchmark of 3–4%.
- **Distribution deficiency**: Remote locations face inadequate physical outreach, weak agent networks, and infrastructure limitations.
- **Digital risk**: Digital push improves access but risks excluding digitally illiterate populations, requiring parallel offline strategies.

Conclusion

As an autonomous regulator, IRDAI has significantly transformed India's insurance landscape in liberalising the market, enhancing consumer protection, and pushing digital reforms. Further strengthening risk-based supervision, incentivising rural distribution, and improving claim settlement efficiency will be critical for IRDAI to fulfil its dual mandate of regulation and promotion in a growing, diverse market.

Technology-Driven Governance

Syllabus Mapping: GS2, E-governance- applications, models, successes, limitations, and potential

Context

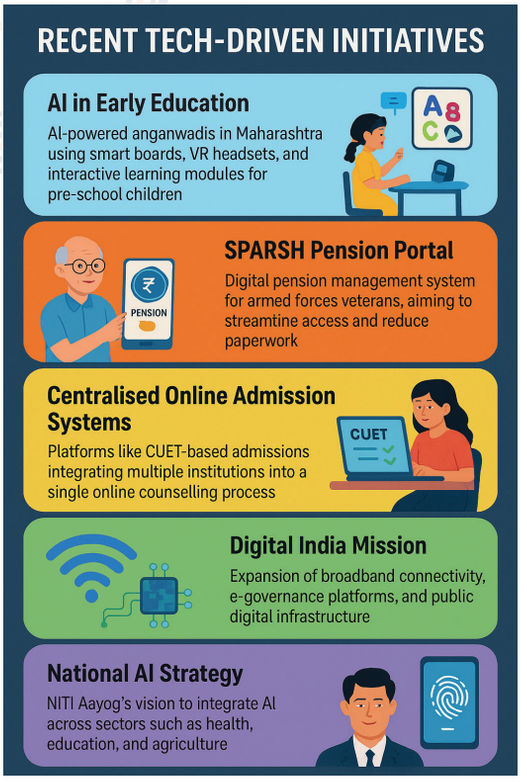
India is witnessing a rapid push towards **technology-driven governance and service delivery**, with digitalisation seen as a key tool for efficiency, transparency, and outreach.

Introduction

From **AI-powered learning tools in schools** to **online pension portals** and **centralised university admissions**, India's governance landscape is undergoing a digital transformation. AI holds the potential to drive efficiency, transparency, and inclusivity in public service delivery.

Transformative Potential of AI in India's Governance landscape

- **Enhanced Service Delivery**: Artificial Intelligence (AI) streamlines public services by automating routine processes, reducing administrative burden, and improving the quality of governance.
  - **Education**: AI enables personalized learning, smart content creation, and automated assessments.
    - **Eg: NCERT's National Repository of Open Educational Resources (NROER)** now uses 31 metadata tags per resource to enable adaptive and AI-supported learning tools.
  - **Healthcare**: AI strengthens telemedicine and diagnostics, especially in underserved regions.
    - **Eg: NITI Aayog, in collaboration with the Department of Biotechnology**, is creating a database of cancer-related radiology and pathology images to aid AI-based cancer diagnosis and treatment.
  - **Agriculture**: AI enhances farming through weather prediction, pest control, and efficient resource usage.
    - **Eg: The National Pest Surveillance System** applies AI and ML to detect crop diseases and facilitate timely interventions.
- **Judicial Reforms and Legal Efficiency:** AI aids in judicial reforms by automating case workflows, predicting case outcomes, and improving legal research.



  - **Eg: SUVAS (Supreme Court Vidhik Anuvaad Software)** is an AI tool that translates legal documents, easing language barriers in court proceedings.
- **Disaster Management and Emergency Response:** AI tools offer predictive modeling and real-time decision-making support in disaster response.
  - **Eg: The RAHAT app** employs AI to issue early warnings for natural disasters like floods and supports rescue and relief operations.
- **Promoting Inclusivity and Accessibility**: AI-powered platforms make governance more inclusive in a linguistically diverse country like India.
  - **Eg: The Bhashini platform** uses AI to deliver government services in multiple Indian languages, enhancing accessibility for non-English speakers.

Barriers to Effective AI Integration in Governance

- **Data Privacy Concerns**: AI systems heavily rely on sensitive and large-scale data, increasing vulnerability to breaches.
  - **Eg: The Aadhaar data leak**, which exposed information of 81.5 crore individuals on the dark web, underscored the risks of weak data safeguards.
- **Issues in Regulatory Framework:** India lacks a specific AI law or updated data protection regime to regulate how AI can be used by the government and private sector.
  - **Eg: Digital Personal Data Protection Act, 2023** is a step forward, but doesn't cover AI-specific issues like explainability, autonomy, or ethical design.
- **Weak Intellectual Property (IP) Ecosystem:** India's current IP regime offers limited protection for AI innovations.
  - **Eg: In the 2024 Global IP Index, India ranked 42nd, discouraging AI-related R&D and patenting.**
- **Data Silos Across Departments:** Fragmented and uncoordinated data repositories across various government entities hinder the seamless deployment of AI solutions.
  - **Eg: The National Data Governance Framework Policy (NDGFP)** aims to standardize the handling of non-personal and anonymized data—is yet to be operationalized, stalling efforts for unified data access.
- **Infrastructure Deficiencies**: Limited internet penetration, inadequate digital infrastructure in rural areas, and a lack of high-performance computing capacity restrict AI rollout.
  - **Eg: As of 2023, around 45% of India's population still lacked internet access, according to the IAMAI report.**
- **Talent Shortage:** The country faces a significant shortage of trained professionals in AI and related fields.
  - **Eg: NASSCOM estimates a demand-supply gap of 1.4 lakh AI professionals**, limiting the scalability of AI-driven governance.
- **Ethical and Algorithmic Bias:** AI systems may inherit and amplify social or data-driven biases, leading to unfair or discriminatory outcomes—especially in areas like policing, credit access, and welfare distribution.

Measures for responsible AI-Driven Governance in India

- **Strengthen Risk Assessment and Ethical Oversight:** Continuous evaluation and human oversight must be built into AI systems to mitigate algorithmic biases and manage systemic risks effectively.
- **Safeguard Data Sovereignty and Privacy:** Uphold the principles of the Digital Personal Data Protection Act, particularly in managing sensitive data and regulating cross-border data flows.
- **Promote Fairness, Transparency, and Accountability**: Ensure AI systems are explainable and equitable by integrating fairness audits, transparent algorithms, diverse training datasets, and "model cards" in critical applications like health, finance, and law enforcement.
- **Invest in AI Education and Skilling:** Scale up programs such as INDIAai FutureSkills to bridge the digital divide and bring AI literacy and skills to underserved and rural populations.
- **Encourage Public-Private Partnerships**: Leverage initiatives like IndiaAI Compute Capacity, which plans to deploy over 10,000 GPUs, to bolster AI research, innovation, and startup ecosystems.

Conclusion

Further, **GovAI** has the potential to make governance more precise, targeted, and aligned with the vision of **"maximum governance, minimum government."** As Chair of the **Global Partnership on AI (GPAI),** India has taken the lead in promoting trusted international cooperation to shape the ethical and strategic future of AI technologies.

National Cooperative Development Corporation (NCDC) Scheme

Syllabus Mapping: GS2, Development processes and development industry

Context

Cabinet approved Grant-in-aid to NCDC scheme with a total outlay of ₹2,000 crore spread over four years (FY 2025-26 to FY 2028-29), with ₹500 crore allocated annually through budgetary support from the Government of India.

Introduction

The **United Nations' declaration of 2025 as the International Year of Cooperatives** reaffirms the significance of cooperative enterprises in building inclusive and sustainable economies. With 20% of India's population participating in cooperative societies, it plays a crucial role in empowering local communities aligning with the vision of **Atmanirbhar Bharat**

NCDC Scheme

Grant-in-Aid to NCDC Scheme

- **Type:** Central Sector Scheme
- **Objective**: To extend loans to cooperatives for establishing new projects, expanding existing units, and fulfilling working capital requirements.
- **Fund Mobilization**: The grant will enable NCDC to leverage an additional ₹20,000 crore from the open market during the four-year period.
- **Executing Agency:** National Cooperative Development Corporation (NCDC), responsible for disbursement, monitoring project implementation, and loan recovery.

Scope of Loans

- **Long-Term Credit:** For setting up, modernization, technology upgradation, and expansion of project facilities across sectors.
- **Working Capital:** To ensure smooth functioning of cooperatives and enhance their profitability.

Expected Outcomes / Benefits

- **Narrow socio-economic disparities** and promote women's workforce participation.
- **Facilitate creation of income-generating assets** while providing liquidity support.
- **Enable capacity augmentation, modernization, and diversification**, thereby boosting productivity and profitability.

Role played by cooperatives in advancing India's aim of Atmanirbhar Bharat

- **Strengthening Rural and Agricultural Economy: Primary Agricultural Credit Societies (PACS)** provide easy credit, fertilizer distribution, and storage, enabling input self-sufficiency.
  - **Eg: The GOI aims to computerize 63,000+ PACS by 2027.**

- **Promoting Local Production**: Cooperatives encourage local entrepreneurship, processing, and marketing, aligning with vocal locals.
  - **Eg: Amul's dairy model supports 36 lakh milk producers and handles over 26 million litres/day, turning villages into production hubs.**
- **Women and Tribal Empowerment:** Women's cooperatives provide financial independence, self-employment, and collective voice.
  - **Eg: Jaswanti Ben's Lijjat Papad Cooperative empowers over 45,000 women**
  - **Eg: Van Dhan Vikas Kendras (VDVKs) under TRIFED promote tribal entrepreneurship.**
- **Employment Generation**: Cooperatives operate in various sectors—handicrafts, fisheries, housing, and microfinance—creating sustainable, community-based jobs.
  - **Eg: A new report by Primus Partners** indicates that cooperatives are set to generate **56 million self-employment opportunities by 2030**, strengthening financial inclusion and rural development.
- **Digital Transformation and Market Access:** National Cooperative Database and e-Marketing platforms (e.g., Sahakar Se Samriddhi) enable digital service delivery, real-time procurement, and price discovery.
  - **Eg: Launch of the CRCS-Sahara Refund Portal in 2023** enhances transparency and accountability in financial cooperatives.
- **Reducing Regional and Sectoral Disparities**: Cooperatives act as socio-economic equalizers by pooling local resources and redistributing surpluses within the community.
  - **Eg:** Fisheries cooperatives in Kerala and Meghalaya have improved livelihoods and reduced out-migration.

COOPERATIVES IN INDIA

MAJOR SECTORS:

The most prominent cooperative sectors in India include:

Housing | Dairy | Primary Agricultural Credit Societies (PACS)

CONTRIBUTION:

About 57% of the country's cooperatives are concentrated in a few key states:

Maharashtra alone accounts for 25% of the total cooperatives in India

CONSTITUTIONAL RECOGNITION

Fundamental Right:

Right to form cooperattive societies under Article 19(1)(c).

Directive Principle:

Added Article 43B to promote voluntary formation, autonomous functioning and professional managenment of cooperatives.

New Part IXB (Articles 243ZH to 243ZT): Established a comprehensive framework for the governance of soccieties

Governance Framework:

Regulated by the Multi-State Cooperative Societies Act, 2002

Limitations in the role played by Cooperatives

- **Internal issues:** Many cooperatives are plagued by **nepotism, elite capture, and lack of internal democracy**. This hampers transparency and performance, especially in state-dominated sectors like sugar cooperatives in Maharashtra.
  - **Eg: A 2022 study by the Institute of Rural Management Anand (IRMA)** found that over 40% of elected directors in PACS were politically affiliated, reducing the autonomy of cooperatives.
- **Uneven Regional Distribution:** Cooperative development is highly skewed toward certain states like Maharashtra, Gujarat, Kerala, and Karnataka.
  - **Eg: According to the Ministry of Cooperation (2024),** Maharashtra alone accounts for 25% of the total cooperatives in India. While states in the North East have weak cooperative penetration.
- **Limited Professional Management:** Most cooperatives lack trained professionals in finance, marketing, and digital technology.
  - **Eg: The 2023 Primus Partners report** noted that only 8% of cooperatives surveyed had professional CEOs or trained managers.
- **Financial Constraints and Credit Linkages:** Cooperatives face poor access to institutional finance, especially for working capital and modernisation.
  - **Eg:** In Bihar and Jharkhand, PACS often depend on informal lenders due to delayed refinancing.
- **Lack of Digital Integration:** Absence of digital infrastructure restricts cooperatives' market access and governance efficiency.
  - **Eg: The "Janani" platform for women-led cooperatives** remains underutilised due to lack of digital onboarding.
- **Limited Market Access:** Most cooperatives lack visibility, national branding, or value-chain integration.
  - **Eg: The Economic Survey (2021–22**) highlighted that cooperatives contribute less than 1% to agricultural exports due to branding and market linkage issues.

Way forward to make cooperatives a reliable partner in the development industry

- **Technology and Market Integration**: Integrate cooperatives with digital commerce platforms like the **Open Network for Digital Commerce (ONDC)** to improve logistics and widen market access.
  - **Eg: Specialised initiatives such as "Janani", an e-marketplace for women-led cooperatives**, should be promoted to support inclusive growth.

- **Global best practices:** Learning from global best practices such as **Italy (agri-cooperatives), Japan (consumer cooperatives), and Kenya (savings and credit cooperatives)**
- **Continuity in policy support:** The new ₹2,000 crore grant-in-aid to NCDC scheme and earlier reforms like the **Multi-State Cooperative Societies (Amendment) Act, 2023,** the creation of the **Ministry of Cooperation in 2021**, show continuity in policy support towards cooperatives.
- **Capacity Building**: Set up **Centres of Excellence (CoEs)** in collaboration with institutions like **Krishi Vigyan Kendras (KVKs)** to provide training in digital literacy, entrepreneurship, and modern farming practices.
- **Access to Finance**: Broaden the scope of Priority Sector Lending (PSL), encourage the use of CSR funds and foster collaborations with international development agencies for concessional funding.
- **Brand Development**: Enhance the public profile of cooperatives through structured branding campaigns and clearly articulated long-term visions.
  - **Eg: One District One Cooperative (ODOC) initiative to improve scalability.**
- **Regulatory and Governance Reforms:** Strengthen internal governance mechanisms by instituting robust regulatory frameworks focused on accountability, transparency, and compliance. Bring cooperatives under the purview of the RBI to ensure uniform standards and better financial oversight.
- **Quantify socio-economic impact:** Cooperatives account for nearly 3% of India's GDP, include 8.5 lakh societies with over 29 crore members, and thus remain a critical pillar of rural livelihoods.

Conclusion

Recently, the 'Five P' strategy - People, PACS, Platforms, Policy, and Prosperity has been proposed by the Home Minister to leverage cooperatives as foundational pillars of reform. The success of the NCDC scheme will hinge on how well India can modernize cooperatives into digitally driven, professionally managed, and community-centric institutions. If executed well, cooperatives can bridge rural-urban divides, empower marginalized groups, and anchor India's ambition of becoming **a $10 trillion economy by 2035**

TOPICS FOR PRELIMS

Reorganisation of states

Context

Tamil Nadu Governor R N Ravi criticized the linguistic division of states, calling it a cause for creating "second-class citizens," sparking controversy amid renewed debates on language politics in India.

Reorganisation of States in India

- **Historical Background**:
  - Post-independence India required an efficient administrative setup.
  - The need arose to reorganise states for **better governance**, **administrative convenience**, and **cultural representation**.
- **State Reorganisation Act, 1956**:
  - Came into force on **31 August 1956**.
  - Based on recommendations of the **States Reorganisation Commission (SRC)**, 1953.
  - Marked a shift from colonial administrative units to **linguistically and culturally aligned states**.

Pre-1956 Administrative Structure

- **State Classification (1951)**:
  - **Part A**: Former British provinces (e.g., Bombay, Madras, UP).
  - **Part B**: Princely states that had signed instruments of accession (e.g., Hyderabad, Mysore, PEPSU).
  - **Part C**: Former Chief Commissioners' provinces and smaller princely states (e.g., Delhi, Bhopal, Manipur).
  - **Part D**: Only **Andaman and Nicobar Islands**, directly administered by the President.

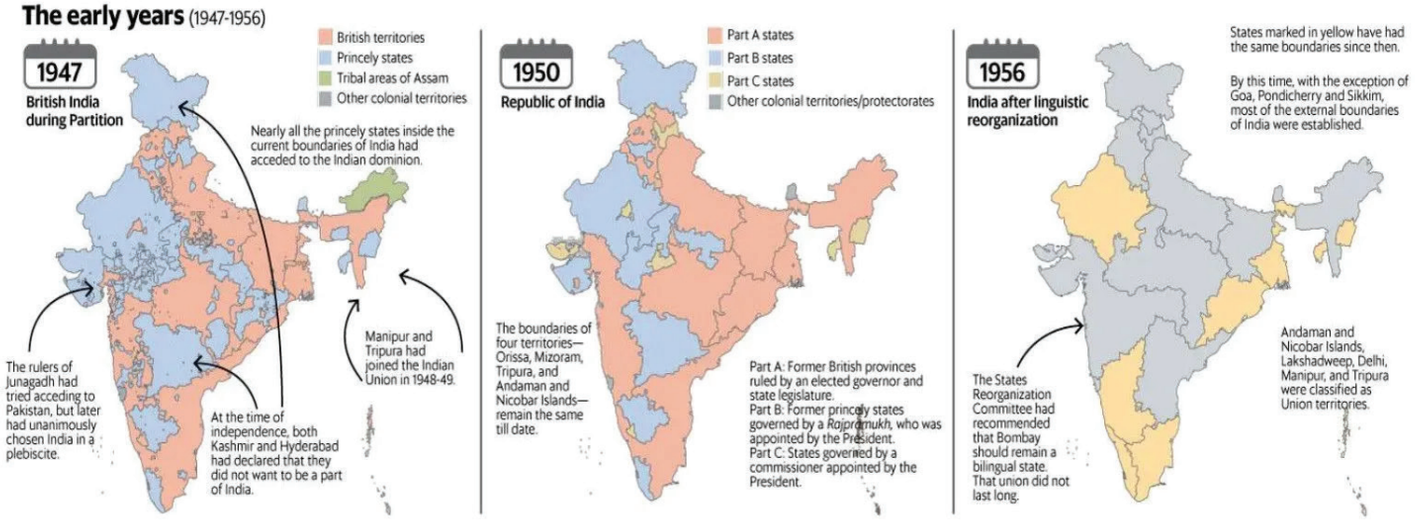
Major Factors Behind State Reorganisation

- **Linguistic & Cultural Identity**: Andhra Pradesh was the **first linguistic state** (1953), created after the death of **Potti Sriramulu**.
  - Language often coincided with **cultural unity** and made governance easier.
- **Tribal & Ethnic Considerations**: States like **Nagaland** were formed to accommodate tribal uniqueness.
- **Economic Aspirations**: Regions like **Chhattisgarh, Jharkhand, and Telangana** demanded statehood to ensure focused economic development.
- **Administrative Viability**: States like **Uttarakhand** were carved from larger units for efficient administration.
- **Security Concerns**: **Jammu & Kashmir** was reorganised in 2019 due to national security and administrative issues.

Key Commissions on State Reorganisation

- **Dhar Commission (1948)**:
  - Rejected linguistic division.
  - Favoured factors like administrative convenience and financial viability.

- **JVP Committee (1948)**:
  - Members: Nehru, Patel, Pattabhi Sitaramayya.
  - Stressed national unity over language.
  - Allowed linguistic reorganisation only if public demand was overwhelming.
- **Fazl Ali Commission (1953)**:
  - Accepted **language as a factor**, but not the sole criterion.
  - Recommended creation of **16 states and 3 Union Territories**.
  - Basis for the **States Reorganisation Act, 1956**.



Outcomes of 1956 Reorganisation

- **Post-1956 Setup**:
  - Replaced the A/B/C/D classification.
  - Created **14 states and 6 Union Territories**.
  - Passed alongside the **7th Constitutional Amendment Act (1956)**.
  - **Examples**:
    - **Kerala (1956)**: Formed by merging Travancore-Cochin with Malabar.
    - **Bombay State** was reorganised leading to Maharashtra and Gujarat.

States Created After 1956

- **1960**: **Maharashtra** and **Gujarat** (Samyukta Maharashtra and Mahagujarat movements)
- **1966**: **Punjab**, **Haryana**, and **Himachal Pradesh** (Punjabi Suba movement; Chandigarh as UT)
- **1971**: **Himachal Pradesh** granted full statehood.
- **1972**: **Manipur**, **Tripura**, **Meghalaya** became full-fledged states.
- **1975**: **Sikkim** joined India and became a state (earlier a protectorate).
- **1987**: **Goa** became a state; **Mizoram** and **Arunachal Pradesh** were upgraded from UTs.
- **2000**: **Chhattisgarh**, **Uttarakhand**, and **Jharkhand** formed from MP, UP, and Bihar respectively.
- **2014**: **Telangana** formed from Andhra Pradesh after prolonged agitation.
- **2019**: **Jammu & Kashmir** reorganised into **two UTs: J&K and Ladakh** (Article 370 revoked).

Ongoing and Emerging Statehood Demands

- **Uttar Pradesh**: Proposals to divide into Purvanchal, Bundelkhand, Awadh Pradesh, and Paschim Pradesh.
- **Vidarbha**: Eastern Maharashtra demand for separate statehood.
- **Other Demands**:
  - **Gorkhaland** (North Bengal), **Bodoland** (Assam), **Maru Pradesh** (Rajasthan)
  - **Kamtapur**, **Coorg**, **Rayalaseema**, **Saurashtra**, **Mithila**, **Panun Kashmir**, **Bru Land**, **Chakma territory**, and more.

Anti Defection

Context

The Supreme Court has questioned the Telangana Speaker for delaying action on the **disqualification of BRS MLAs who defected to Congress, highlighting concerns over constitutional duties and anti-defection law.**

Anti-Defection Law

- **Defection:** It refers to an elected representative **switching allegiance** from one political party to another or becoming independent, often for personal gain or political advantage.
- **Origin of Anti-Defection Law in India**
  - **Introduced**: By the **52nd Constitutional Amendment Act, 1985**
  - **Inserted in**: **Tenth Schedule** of the Constitution
  - **Purpose**: To curb political defections and bring **political stability**, **party discipline**, and **accountability**.

Key Provisions of the Tenth Schedule

- **Disqualification Grounds:**
  - **Voluntary resignation** from a party by an elected member.
  - **Voting/abstaining against party directions** (whip) without prior approval and not being condoned within 15 days.
  - **Independent members**: Disqualified if they join any political party after the election.
  - **Nominated members**: Disqualified if they join a political party after **6 months** from taking their seat.
- **Exceptions:**
  - **Merger Provision**: If **2/3rd members** of a party agree to merge with another, it is not considered defection.
  - **Presiding Officers**: Exempted if they resign from their party after being elected **Speaker/Chairman**, and rejoin after leaving office.

Authority to Decide Defection

- **Who decides?**: The **Speaker/Chairman** of the House
- **Rule-making Power**: The presiding officer can frame rules to implement the Tenth Schedule.
- **Trigger for Action**: Requires a formal **complaint by a House member** to initiate proceedings.

Role of Whip in Anti-Defection

- **Whip**: A directive issued by political parties to ensure members vote in line with party positions.
- **Defiance**: Violating a whip may lead to disqualification under the Tenth Schedule.

- **Article 122**: Courts cannot inquire into the validity of parliamentary proceedings.
- **Article 212**: Similar protection for state legislatures — courts cannot question procedural irregularities.

Judicial Interpretations & Key Cases

- **Kihoto Hollohan v. Zachillhu (1992)**: Upheld constitutional validity of the Tenth Schedule.
  - However, ruled that the Speaker's **decision is subject to judicial review** on grounds of **malafide or perversity**.
- **Ravi S. Naik v. Union of India (1994)**: Even implicit resignation from a party (voluntarily giving up membership) can lead to disqualification.
- **G. Viswanathan v. Speaker, Tamil Nadu Assembly (1995)**: Validated Speaker's authority in defection cases; decision cannot be questioned in court unless proven biased.
- **Supreme Court (2020 Judgment)**: Directed that **defection petitions must be decided within 3 months** to prevent indefinite delays.

91st Constitutional Amendment Act, 2003 – Key Changes

- **Ministerial Cap**: Total ministers (including PM/CM) limited to **15%** of the House strength.
- **Disqualification of Ministers**: Disqualified defectors cannot be appointed as ministers or hold remunerative political posts.
- **No Split Provision**: The **one-third split clause** was removed. Only a **two-thirds merger** is now valid.

Lok Adalats

Context

Banking disputes, NBFC recovery cases, and gas supply issues have been brought under the purview of **Lok Adalats** to ensure faster, cost-effective resolution.

What is Lok Adalat?

- **Origin in Ancient India**: Concept inspired by **village panchayats** that settled disputes informally.
- **Statutory Backing**: Formalized through the **Legal Services Authorities Act, 1987**.
- **Objective**: To ensure **affordable, accessible, and speedy justice**, especially for those **financially or geographically disadvantaged**.

Legal Provisions

As per Legal Services Authorities Act, 1987:

- **Section 19**: Establishes Lok Adalats at various levels – State, High Court, District, and Taluk.
- **Section 20**: Describes which cases may be referred to Lok Adalat:
  - Pending in court.
  - At the pre-litigation stage.
- **Section 21**:
  - The **award of Lok Adalat is deemed a decree of a civil court**.
  - It is **final, binding, and enforceable**; **no appeal lies** against it.
- **Section 22**: Lok Adalats have the powers of a **civil court** under the Code of Civil Procedure (CPC), including:
  - Summoning witnesses
  - Receiving evidence
  - Requisitioning public records

Latest Developments (2024–2025)

- Lok Adalats are now addressing:
  - **Banking disputes and NBFC loan recoveries**
  - **Gas supply issues**
  - **Traffic challans, electricity bills, insurance claims**, etc.
- Digital Lok Adalats are increasingly being used to **expand access** and **reduce backlog**.
- **AI-based e-Lok Adalats** piloted in some states (e.g., Maharashtra, Delhi, Rajasthan).

Key Features

- **Voluntary**: Parties must agree to settle the matter.

- **No Court Fees**: Any court fee paid is refunded if the case is settled.
- **Speedy Disposal**: Cases resolved in a single sitting.
- **Non-Adversarial**: Focus is on **compromise and harmony**, not winning/losing.

Collusive litigations

Context

The Supreme Court has taken a suo motu cognisance of "collusive litigations" by officials of the Bengaluru Development Authority (BDA).

About Collusive Litigation

- It refers to a lawsuit where the parties involved are **not genuinely adversarial but cooperate to achieve a predetermined outcom**e.
- The parties may share a common goal or interest, often **to manipulate the judicial process or challenge a law's constitutionality.**
- Such litigation undermines the adversarial system by creating a false dispute and can be abused to circumvent normal legislative procedures.
- In India, collusive decrees can be set aside if proven to involve collusion or fraud, but only by parties **not involved in the collusion (i.e., third party).**
- The **burden of proof lies with the challenger** seeking to invalidate the decree.
- Courts have the authority to intervene in such cases to uphold the integrity of the judicial process.

Section 98 of the Bhartiya Nagarik Suraksha Sanhita (BNSS)

Context

The J&K government declared **25 books by noted authors** like Arundhati Roy and A.G. Noorani as **"forfeited"** for allegedly promoting secessionism and false narratives under **Section 98 of the BNSS Act 2023.**

Section 98 – Power to Forfeit Certain Publications and Issue Search Warrants

- If the State Government believes that any **newspaper**, **book**, or **document** contains material punishable under specific sections of the Bharatiya Nyaya Sanhita (BNS), 2023—namely **sections 152, 196, 197, 294, 295, or 299—**it may issue a **notification** outlining the reasons and declare such copies forfeited to the Government.
- **Definitions:** Terms are as per the **Press and Registration of Books Act, 1867**:
  - **"Newspaper"** and **"Book"** have the same definitions as in that Act.
  - **"Document"** includes:
    - Paintings
    - Drawings
    - Photographs
    - Any visible representation
- **Legal Protection:** Any **order or action** under this section **cannot be challenged in court**, except through the procedure provided in **Section 99** of BNSS.

Section	Offence Description
152	Promoting enmity between different groups on grounds of religion, race, place of birth, residence, language, etc., and doing acts prejudicial to maintenance of harmony. **(Replaces IPC Section 153A)**
196	Sedition — covers acts that bring or attempt to bring into hatred or contempt, or excite disaffection towards the Government of India. **(Replaces IPC Section 124A)**
197	Waging or attempting to wage war, or abetting the waging of war, against the Government of India. **(Similar to IPC Section 121)**
294	Obscene acts and songs — doing any obscene act in public, or singing/uttering any obscene song or words in or near public places. **(Replaces IPC Section 294)**
295	Injuring or defiling a place of worship with intent to insult the religion of any class. **(Replaces IPC Section 295)**
299	Statements, rumours, etc., with intent to cause public mischief. **(Replaces IPC Section 505)**

National Human Rights Commision (NHRC)

Context

The National Human Rights Commission (NHRC), India has taken suo motu cognizance of a media report related to the death of 3 children in Meerut district of Uttar Pradesh.

Functions of NHRC

About National Human Rights Commission (NHRC)

- **Headquarters:** New Delhi
- **Established:** 1993 under the **Protection of Human Rights Act** (PHRA), amended in **2006** & **2019**.
- **Body:** Statutory body.

- **Definition of Human Rights (PHRA):** Rights relating to **life, liberty, equality, and dignity**, guaranteed by the Constitution or international covenants, enforceable by Indian courts.
- **Appointment:**
  - **Appointed by:** President of India on recommendations of a committee headed by the Prime **Minister**.
  - **Committee Members:** PM, Speaker of Lok Sabha, Home Minister, Leaders of Opposition (Lok Sabha & Rajya Sabha), Deputy Chairman of Rajya Sabha.
- **Composition:**
  - **Chairperson:** A **retired Chief Justice of India** or a **Judge of the Supreme Court**.
  - **Five Full-time Members:**
    - **Retired or serving Judge of the Supreme Court**.
    - **Retired or serving Chief Justice of a High Court**.
    - **Three other members** with **knowledge and practical experience in human rights** (at least **one shall be a woman**).
  - **Seven Deemed Members:** Chairpersons of:
    - National Commission for Minorities
    - National Commission for Backward Classes
    - National Commission for Persons with Disabilities
    - National Commission for Scheduled Castes
    - National Commission for Scheduled Tribes
    - National Commission for Protection of Child Rights
    - National Commission for Women
- **Tenure & Removal:**
  - **Tenure:** 3 years or till 70 years of age (whichever earlier).
  - **Reappointment:** Chairperson & Members eligible.
  - **Removal:** By President for proved misbehaviour/incapacity after Supreme Court consultation.
- **Powers:** Powers of a **Civil Court** under Code of Civil Procedure, 1908:
  - Summon & examine witnesses on oath.
  - Demand discovery/production of documents.
  - Receive evidence via affidavits.
  - Requisition public records.
  - Issue commissions for witness/document examination.

Sixth Schedule

Context

Sonam Wangchuk and other leaders joined a **hunger strike** in Kargil demanding **Ladakh's statehood** and its inclusion in the **Sixth Schedule** of the Constitution.

Provisions of the Sixth Schedule

- **Article 244(2):** Applies to the administration of tribal areas in **Assam, Meghalaya, Tripura, and Mizoram**.
- **Autonomous Districts & Regions:**
  - Tribal areas are designated as **Autonomous Districts**.
  - If multiple Scheduled Tribes live in a district, the Governor can create **Autonomous Regions**.
  - Governors can organize, reorganize, alter boundaries, or rename districts.
- **District & Regional Councils:**
  - **District Council:** Max 30 members (4 nominated by Governor, rest elected through adult suffrage).
  - **Regional Council:** For each autonomous region.
- **Law-making powers:**
  - Can legislate on land, forests (except reserved), property inheritance, money-lending, trade by non-tribals.
  - All laws need the Governor's assent.
- **Judicial powers:**
  - Can set up **Village & District Council Courts** for cases where all parties are Scheduled Tribes.
  - Cannot try cases with punishments of death or 5+ years imprisonment.
- **Revenue & Taxation:**
  - Can assess land revenue, impose taxes on trades, animals, vehicles, etc.
  - Can grant mining licenses and leases.
- **Development powers:** Can manage schools, dispensaries, markets, fisheries, roads, transport, and waterways.
- **Applicability of laws:** Parliamentary/State laws apply with modifications or exceptions.
- **Governor's oversight:** Can appoint a commission to review district/region administration.

Benefits of the Sixth Schedule

- **Protection of Tribal Rights & Identity:** Safeguards land, culture, and traditions of tribal communities from external exploitation.
- **Local Self-Governance:** Empowers Autonomous District and Regional Councils to legislate on local matters, ensuring governance is tailored to community needs.
- **Cultural Preservation:** Helps preserve indigenous languages, customs, and festivals through local decision-making.
- **Control over Natural Resources:** Allows tribal councils to regulate land use, forests, and minerals, ensuring sustainable use and preventing outsider exploitation.
- **Judicial Autonomy:** Special courts for tribal disputes provide culturally appropriate justice systems.
- **Economic Empowerment:** Councils can levy taxes, manage markets, and grant licenses for resource extraction, generating local revenue.
- **Education & Infrastructure Development:** Powers to establish schools, dispensaries, fisheries, roads, and transport systems enable targeted development.
- **Administrative Flexibility:** Ability to adapt laws and governance structures to local customs and needs rather than rigid state-wide policies.

- **Conflict Prevention:** By giving decision-making power to local bodies, reduces tensions between the state and tribal communities.
- **Environmental Protection:** Local control over forests and resources promotes ecological conservation aligned with traditional practices.

Income Tax Bill 2025

Context

Lok Sabha has passed the **revised Income Tax Bill, 2025**.

Key Provisions

- Replaces and shortens the existing Income Tax Act, 1961 (2.59 lakh words vs. 5.12 lakh words).
- Reduces chapters from 47 to 23 and sections from 819 to 536.
- Empowers officials to forcibly access personal emails and social media accounts of assessees during searches.
- Allows authorised officers to demand access codes for books, documents, or data in electronic form.
- Permits overriding of access codes to any computer system if codes are not provided.
- Covers all types of personal digital data including passwords, chats, and messages.
- Justified as necessary for retrieving incriminating evidence from electronic devices.
- Criticised for potential misuse, privacy violations, and excessive powers to authorities.

Talaq-e-hasan

Context

The Supreme Court has recently decided to examine multiple petitions that question the constitutional validity of the practice of **talaq-e-hasan**.

About Talaq-e-Hasan

- An extrajudicial form of divorce in Islam, available **only to men.**
- Considered **revocable** and recognised as valid under all schools of Muslim law.
- Traditionally approved by Prophet Mohammad.
- Procedure: Husband pronounces **talaq** three times, with a gap of **one month** between each pronouncement.
- The interval between pronouncements is called the **period of abstinence (iddat)**, lasting **90 days**.
- If the couple resumes cohabitation or intimacy during **iddat**, the divorce is automatically revoked.

Difference from Triple Talaq (Talaq-e-Bidat)

- In Triple Talaq, the husband pronounces **talaq** three times **at once**, making the divorce **instant and irrevocable**.
- **Talaq-e-Hasan** involves a waiting period (**iddat**) and allows revocation of reconciliation before completion.
- The Supreme Court declared the practice unconstitutional in **Shayara Bano v. Union of India (2017)**, and the **Muslim Women (Protection of Rights on Marriage) Act, 2019**, subsequently made it a criminal offense.

CEA

Context

The Cooperative Election Authority (CEA) held its first consultative meeting with State Cooperative Election Authorities in New Delhi to strengthen dialogue and ensure that **cooperative society elections are conducted in a free, fair, and transparent manner.**

About Cooperative Election Authority (CEA)

- **Establishment:** Constituted under the **Multi-State Cooperative Societies (MSCS) Act, 2002**.
- **Mandate:** Conduct elections to the boards of **multi-state cooperative societies** in a **free, fair, and transparent** manner.
- **Jurisdiction:** Covers cooperatives registered under the **central act** that operate in more than one state.
- **Functions:**
  - Prepare and update the **electoral rolls** for cooperative society elections.
  - Issue election notifications and oversee the entire election process.
  - Appoint returning officers and other staff for smooth conduct of elections.
  - Ensure compliance with election rules under the MSCS Act and related rules.
- **Composition:**
  - Headed by a **Chairperson**, appointed by the Central Government.
  - Assisted by members and staff for election management.
- **State-Level Coordination:** Works with **State Cooperative Election Authorities** for societies that have both state and multi-state operations.
- **Significance:**
  - Promotes democratic functioning in cooperatives.
  - Ensures representation of members in governance.
  - Prevents disputes and malpractice in cooperative elections.

OCI

Context

India has tightened OCI (Overseas Citizen of India) norms.

OCI (Overseas Citizen of India) Scheme

- Launched in **2005** under the **Citizenship (Amendment) Act, 2005**.

- Designed for people of Indian origin living abroad, except those who have ever been a citizen of **Pakistan** or **Bangladesh**.

Current Rules for OCI (Overseas Citizen of India) Cardholders

- **Eligibility Rules**
  - Must be a person of Indian origin or their descendant (up to great-grandchild).
  - Spouses of Indian citizens or OCI cardholders are eligible (if marriage subsists for at least 2 years).
  - Citizens of **Pakistan** or **Bangladesh**, or those who ever held these citizenships, are **not eligible**.
- **Restrictions**
  - No right to vote in Indian elections.
  - Cannot hold constitutional or government posts.
  - Cannot buy agricultural or plantation land in India.
- **Grounds for Cancellation (Section 7D of Citizenship Act)**
  - Obtaining OCI by fraud or misrepresentation.
  - Showing disaffection towards the Indian Constitution.
  - Conviction and imprisonment for **two years or more** within five years of registration.
  - Acts against the sovereignty, integrity, or security of India.
  - **New Rule (2024–25)**:Allowing cancellation of OCI status if the holder is convicted and sentenced to at least two years in prison—or even if formally charge-sheeted in a case punishable by seven years or more.

Who decides nomination to UT assemblies?

Context

- Debate on **nominations to Union Territory (UT) Assemblies** revived after the Union Home Ministry's affidavit in J&K and Ladakh High Court.
  - The affidavit stated that the **Lieutenant Governor (LG) of J&K can nominate 5 members** to the Assembly without the Council of Ministers' advice.

Constitutional Provisions on Nominations

- **Parliament & State Legislatures**: Constitution allows nominated members.
  - Anglo-Indian representation abolished in 2020.
  - Rajya Sabha: 12 nominated members (appointed by President on Union Cabinet's advice).
  - Legislative Councils: One-sixth nominated by Governor (on ministerial advice).
- **Union Territories**: Guided by Parliamentary statutes.
  - **Delhi**: No nominated MLAs (70 elected members).
  - **Puducherry**: Union govt can nominate up to 3 members (UT Act, 1963).
  - **J&K**: 90 elected seats; LG can nominate 5 members (women, migrants, displaced persons) under J&K Reorganisation Act, 2019 (amended 2023).

Judicial Precedents

- **Puducherry Case (2018):** Madras HC upheld Union govt's power to nominate 3 members **without ministerial advice**.
  - Recommended statutory clarity, but the Supreme Court later upheld the Union govt's power.
- **Delhi Services Case (2023):** SC highlighted "**triple chain of command**":
  - Civil servants → Ministers
  - Ministers → Legislatures
  - Legislatures → People
    - Strengthens the argument that LGs should act on ministerial advice in Assembly matters.

Commission for Protection of Child's Rights

Context

The Supreme Court dismissed a plea by the National Commission for Protection of Child Rights (NCPCR) challenging a 2022 Punjab and Haryana High Court ruling that allowed marriage of girls aged 15 and above under Muslim personal law, despite the POCSO Act.

National Commission for Protection of Child Rights (NCPCR)

- Constituted under the **Commission for Protection of Child Rights (CPCR) Act, 2005**.
- Mandate: Protection and promotion of **child rights** in India.
- Also monitors the effective implementation of:
  - **POCSO Act, 2012**
  - **Juvenile Justice Act, 2015**
  - **Right to Education (RTE) Act, 2009**
- India acceded to the **UN Convention on the Rights of the Child (CRC)** in 1992.

Composition

- **Chairperson:** Eminent person with outstanding work for child welfare.
  - Tenure: **3 years** or till **65 years** (max 2 terms).
- **6 Members:** At least **2 women**, from fields such as education, child health, child development, juvenile justice, child labour elimination, psychology, sociology, or child laws.
  - Tenure: **3 years** or till **60 years** (max 2 terms).
- **Appointment:** By Central Government.
  - Chairperson on recommendation of a **3-member committee** chaired by the Education Minister.
- **Removal:** By Central Government on grounds such as insolvency, unsound mind, incapacity, misuse of office, conviction with moral turpitude, etc.

Functions & Responsibilities

- Review and recommend measures for effective **child rights protection**.
- Submit reports to the Central Government on safeguards and their effectiveness.

- Investigate **violations of child rights** and recommend legal action.
- Inspect **child care institutions, juvenile homes**, and suggest remedial measures.
- Promote **research and awareness** on child rights.
- Take **suo motu notice** of child rights violations and non-implementation of laws.
- Specific mandates:
  - **RTE Act (2009):** Review implementation of child rights safeguards.
  - **POCSO Act (2012):** Monitor designation of Special Courts & guidelines.
  - **Child Care Institutions (CCIs):** Monitor functioning and conduct social audits (as per SC directions).

Powers

- Powers of a **Civil Court**:
  - Summon witnesses, examine on oath.
  - Demand documents and public records.
  - Receive affidavits.
  - Issue commissions for examination of witnesses.
- After inquiry, may:
  - Recommend **prosecution**.
  - Approach **SC/HC** for writs or directions.
  - Recommend **interim relief** to victims or families.

Key Initiatives

- **POCSO e-Box:** Online complaint system for child sexual abuse.
- **Samvardhan:** Vulnerability mapping program to combat child trafficking.
- **MASI App:** Real-time monitoring of CCIs (Monitoring App for Seamless Inspection).
- **GHAR Portal:** "Go Home and Re-Unite" portal for restoration and repatriation of children.

State Commission for Protection of Child Rights (SCPCR)

- Established by **State Governments** under CPCR Act, 2005.
- Chairperson & members appointed by the State **Government** (on recommendation of a selection committee chaired by the Minister for Children's Department).
- Composition, eligibility, and tenure are similar to **NCPCR**.

Section 152 of BNS

News? The Supreme Court has questioned the **"potentiality of abuse"** of **Section 152 of the Bharatiya Nyaya Sanhita**.

Section 152 of the Bharatiya Nyaya Sanhita (BNS) – Provisions

- It criminalizes the acts of anyone who,
  - Excites or attempts to excite **secession**, **armed rebellion**, or **subversive activities**;
  - Encourages **feelings of separatist activities**;
  - Engages in any act that **endangers India's sovereignty, unity, and integrity**.
- Violators face **imprisonment for life** or up to **seven years**, along with a **fine**. This is a **cognizable**, **non-bailable** offense, triable by a **Court of Session**.
- Although the term **"sedition"** is not used in Section 152, it is broadly considered a successor to Section 124A of the Indian Penal Code (IPC)

ECONOMY AND AGRICULTURE

TOPICS FOR MAINS (ECONOMY)

Status of India's economy

Syllabus Mapping: Indian Economy and issues relating to Growth, Development and Employment

Context

In response to imposing a **25% tariff on India**, former US President Donald Trump made a statement on social media, asserting that he did not care if India and Russia **"take their dead economies down together."**

Status of the Indian Economy

India's economy is far from stagnant and is recognized globally for its robust performance. Here are the key highlights:

- **Fastest-growing major economy:** India ranks among the world's fastest-growing major economies and is projected to become the **third-largest economy globally** within the next few years.
- **Significant GDP expansion:** From 1995 to 2025, India's GDP has expanded to **nearly 12 times** its size in 1995. This remarkable multiplication reflects sustained economic reforms, population-driven demand, and diversification across sectors.
- **Contribution to global growth:** According to IMF data, India accounts for approximately **16% of global economic growth.** This positions India as a key driver in the world economy, helping stabilize and propel international progress amid slowdowns in other regions.
- **Shift in global perception:** India has transitioned from being part of the **"Fragile Five"** economies (a term used in 2013 for vulnerable emerging markets) to being hailed as a **"bright spot"** by major global financial institutions like the IMF and World Bank.
- **Growth in exports and manufacturing:** While progress is not uniform across all sectors, India's exports and manufacturing have seen notable increases. Initiatives like **"Make in India"** have boosted certain industries, attracting foreign investment and enhancing production capabilities.

Is India's Economy 'Dead' as Trump Claimed?

No, the claim that India's economy is "dead" is politically charged and factually inaccurate. It overlooks substantial evidence of India's economic vitality:

- **Superior growth compared to developed nations:** Between 1995 and 2025, India's economy has grown at a faster rate than that of the US, UK, Germany, and Japan. This comparative outperformance demonstrates India's ability to catch up in a global context.
- **Increasing share relative to the US:** In 1995, India's economy was less than 5% the size of the US economy; by 2025, it has grown to nearly 14% of the US economy. This relative expansion indicates India's rising competitiveness and market potential.
- **Growth among Peers:** Only China, India, and Russia have expanded their economies relative to the US during this period, while America's key allies have seen their shares shrink. This places India in an elite group of nations achieving significant relative gains.
- **Contrast with Japan:** Japan's economy in 2025 is smaller than it was in 1995, highlighting stagnation in some advanced economies. In stark contrast, India has achieved substantial progress, with consistent GDP growth and structural advancements.

Concerns for India

Despite its strengths, India's economy faces several challenges that could hinder long-term sustainability if not addressed:

- **Slower growth Post-2011-12:** Economic growth has moderated since 2011-12, now averaging around 6% annually. This slowdown is attributed to factors like policy disruptions, global uncertainties, and domestic structural issues.
- **Underperformance in manufacturing:** The manufacturing sector has grown at a compound **annual growth rate (CAGR) of 4.04% since 2019-20,** which is lower than **agriculture's 4.72%.** This indicates a need for targeted reforms to boost industrial output and job creation.
- **Low share in global exports:** India holds **only 1.8% of global goods exports and 4.5% in services,** limiting its integration into global value chains and exposing it to trade vulnerabilities.
- **Persistent rural distress:** A majority of farmers operate at subsistence levels, facing issues like low productivity, climate risks, and inadequate infrastructure, which perpetuate poverty in rural areas.
- **Widening Inequality and High Poverty:** Approximately 24% of the population lives below the World Bank's poverty line, with growing income disparities exacerbating social divides.
- **Low Female Labour Participation:** Women's involvement in the workforce remains low, compounded by poor job quality, cultural barriers, and lack of supportive policies.

- **Education-Employment mismatch:** Higher education levels often correlate with higher unemployment rates due to a disconnect between skills taught and market demands.
- **Weak Human Development:** Outcomes in health and education are subpar, with insufficient public investment leading to gaps in access and quality.

Way Forward

- **Boost manufacturing:** Enhance **Production-Linked Incentive (PLI)** schemes and provide greater support to **Micro, Small, and Medium Enterprises (MSMEs).** For instance, companies like **Apple and Samsung** are expanding operations in India under PLI, creating jobs and technology transfer.
- **Expand exports:** Pursue trade agreements and improve logistics infrastructure. An example is the proposed **India-UK Comprehensive Economic and Trade Agreement (CETA**), which could open new markets and boost bilateral trade.
- **Strengthen rural economy:** Promote **agri-processing, Farmer Producer Organizations (FPOs)**, and cold chain infrastructure. The PM-FME scheme (Formalisation of Micro Food Processing Enterprises) aids rural food units in scaling up, improving incomes and reducing waste.
- **Tackle inequality:** Strengthen **Direct Benefit Transfer (DBT)** schemes and reform taxation for better redistribution. **MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act)** has effectively cushioned rural distress by providing wage employment during lean periods.
- **Empower Women:** Focus on skilling and entrepreneurship programs for women. Notably, **70% of MUDRA 'Shishu' loans** (small loans under the Micro Units Development & Refinance Agency) are disbursed to women, fostering financial independence.
- **Align education with Jobs:** Revamp curricula and foster industry partnerships. Initiatives like the **Skill India Mission** and **PMKVY (Pradhan Mantri Kaushal Vikas Yojana)** equip youth with market-relevant skills, bridging the employability gap.
- **Invest in health & education:** Increase public spending and improve access to services. The **Ayushman Bharat Digital Mission** expands healthcare coverage through digital integration, making services more efficient and inclusive.

Conclusion

Trump's characterization of India's economy as "dead" is a misrepresentation that ignores its impressive growth, global contributions, and potential. With proactive policies, India is well-positioned to not only sustain its status as a **global bright spot** but also achieve **inclusive and equitable progress** in the coming decades.

Financial Inclusion in India

Syllabus Mapping: Inclusive Growth

Context

The Reserve Bank of India has reported an improvement in the Financial Inclusion Index, which has risen to **67% in FY 2025, up from 64.2% in FY 2024.**

What is Meant By Financial Inclusion?

- Financial inclusion refers to ensuring access to affordable financial products and services that cater to the needs of individuals and businesses in a responsible and sustainable manner.
- It promotes entrepreneurship, drives business expansion, empowers women, and enhances risk management—ultimately strengthening economic activity, increasing productivity, and fostering overall economic growth.

About the Financial Inclusion Index (FI-Index)

- The **FI-Index** is a **composite measure** designed to track the level of **financial inclusion** across India.
- Developed by the **Reserve Bank of India** in consultation with the **Government** and **sectoral regulators** (banking, insurance, pension, etc.).
- It covers **five key sectors**: **Banking**, **Investments**, **Insurance**, **Postal Services**, and **Pensions**.
- The FI-Index is published **annually**, every July, by the Reserve Bank of India.

Strategies for Financial Inclusion in India

- **National Strategy for Financial Inclusion (NSFI) 2019–2024:** Launched in 2019, aims to remove barriers to accessing financial services and ensure inclusive participation.
- **National Strategy for Financial Education (NSFE) 2020–2025:** Aims to improve **financial literacy**, enabling individuals to make informed and responsible financial decisions.
  - **5-C Approach** to Achieve Strategic Objectives:
    - **Content**: Develop relevant content and integrate financial education into **school, college, and training curricula**.
    - **Capacity**: Build capabilities of intermediaries delivering financial services.
    - **Community**: Utilize **community-led models** for spreading financial awareness.
    - **Communication**: Design an effective **communication strategy** tailored to diverse audiences.
    - **Collaboration**: Strengthen synergy among all involved stakeholders.

Key Initiatives for Financial Inclusion

Initiative	Objective
Pradhan Mantri Jan Dhan Yojana (PMJDY)	To provide basic banking services (savings, deposit, remittance, credit, insurance, pension) affordably to unserved and underserved citizens, enabling financial inclusion.
Centre for Financial Literacy (CFL)	To promote financial literacy through community-led, participatory methods for widespread financial inclusion.
Digital Banking Units (DBUs)	To offer digital banking services (account opening, fund transfers, loans, etc.) through physical units at the last mile.
Pradhan Mantri Suraksha Bima Yojana (PMSBY)	To provide affordable accident insurance (death/disability) to poor and underprivileged sections of society.

Initiative	Objective
Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)	To provide affordable life insurance cover to a broader population including poor and rural citizens.
Atal Pension Yojana (APY)	To ensure old-age security by providing guaranteed pension especially to workers in the unorganised sector.
Pradhan Mantri MUDRA Yojana (PMMY)	To provide easy credit (up to ₹20 lakhs) to small/micro enterprises and entrepreneurs, promoting self-employment.
Stand Up India Scheme (SUI)	To promote entrepreneurship among SC/ST and women by supporting greenfield enterprises through loans and handholding support.
Unified Payments Interface (UPI)	To enable seamless, real-time digital payments and fund transfers for individuals and merchants, accelerating digital financial inclusion.
Mahila Sammriddhi Yojana (MSY)	To empower women from weaker sections by providing skill development, formation of self-help groups, and easy group loans.
Kisan Credit Card (KCC)	To provide timely and affordable credit to farmers for agricultural and allied activities, reducing dependence on informal sources.
Nationwide Campaign for Financial Inclusion (2025)	To saturate coverage of financial inclusion schemes at panchayat/urban local levels, covering new account openings, re-KYC, enrolments for insurance/pension, and awareness on digital fraud and grievance redressal.

Challenges of Financial Inclusion in India

- **Digital Divide:** Limited access to smartphones, internet, and digital infrastructure in rural/remote areas restricts the reach of digital financial services.
- **Low Financial Literacy:** Many individuals, especially in rural and low-income groups, lack the knowledge to use banking and digital platforms effectively.
- **Product Inaccessibility:** Available financial products often do not match the unique needs of low-income or informal sector workers.
- **Infrastructure Bottlenecks:** Inadequate power supply, poor internet connectivity, and lack of last-mile delivery systems hinder access.
- **Dominance of Cash Economy:** A significant portion of the economy still operates in cash, especially in rural and informal sectors, resisting digital adoption.
- **Cost Barriers:** NEFT, RTGS, mobile wallet charges, and minimum balance requirements make banking costly for low-income groups.
- **Lack of Trust in Digital Platforms:** Fear of fraud, data breaches, and low awareness of grievance redressal mechanisms create hesitation in digital adoption.
- **Dependence on Physical Bank Branches:** Many banks still rely on physical presence for basic services like account opening, limiting access in rural and underserved areas.
- **Informal Lending Dominance:** A large section of the population continues to rely on unregulated moneylenders due to lack of formal credit access.

Way Forward

- **Strengthen digital infrastructure:** Expand internet connectivity, provide affordable smartphones, and promote public Wi-Fi in rural areas.
- **Promote financial literacy:** Launch targeted awareness programs using local languages, visual tools, and community-led models to improve understanding of financial services.
- **Develop customized products:** Design financial products tailored for informal sector workers, women, small farmers, and low-income households.
- **Subsidize transaction costs:** Remove or reduce charges on low-value transactions (like NEFT, UPI, wallets) and ensure no-frill, zero-balance accounts.
- **Encourage mobile-first banking:** Promote simple and secure mobile apps for banking, integrated with features like cash flow tracking and voice assistance.
- **Build Consumer trust:** Enforce strong consumer protection rules, data privacy norms, and transparent grievance redressal systems.

- **Digitize core banking services:** Enable full digital onboarding using Aadhaar and biometrics, reducing the need for physical branch visits.
- **Promote open banking ecosystem:** Implement a well-regulated open banking framework to foster innovation, enable data portability, and increase access to credit for small borrowers.
- **Improve credit delivery:** Expand micro-credit and small-ticket loans through credit guarantee schemes and alternate data (like utility bills) for credit scoring.
- **Link government schemes with financial access:** Strengthen integration of DBT, PMJDY, APY, and insurance schemes with financial inclusion strategies to widen coverage.

China's Withdrawal of 300 Chinese Employers: Implication for India

Syllabus Mapping: Indian Economy and issues relating to Growth, Development and Employment

Context

Recently China recalled 300 skilled engineers from Foxconn's iPhone manufacturing in India and restricted rare earths, equipment, and skilled training.

Possible Reasons Behind Recalling 300 Engineers

- **Curtail Technology Transfer:** Prevent Indian manufacturing units — particularly in high-value electronics like iPhones — from acquiring the specialised know-how these engineers possess (production line setup, optimisation, troubleshooting).
- **Delay India's Manufacturing Take-off:** Slow down India's ambition to become a competitive electronics manufacturing hub.
- **Maintain Supply Chain Dependence:** Ensure India remains reliant on Chinese inputs, equipment, and rare earth materials.
- **Preserve Chinese Economic Hegemony:** Block potential competitors to safeguard Beijing's dominant position in Asia's manufacturing and export markets.
- **Leverage Domestic Economic Pressures:** China's slowing economy, ageing population, and overcapacity make protecting export revenues crucial. Neutralising emerging rivals is part of its survival strategy.

How India Can Be Impacted

- **Short-term operational disruption**: Loss of skilled engineers will slow down production ramp-ups, delay projects, and increase dependence on foreign (often Chinese) technical support.
- **Higher costs & slower growth**: Alternative sources for inputs and equipment are more expensive and less efficient, increasing Capex/Opex for Indian firms.
- **Global supply chain hesitation**: Companies may hesitate to shift production from China to India, fearing instability and inefficiency.
- **Persistent trade imbalance**: Electronics imports (42% from China) and the $60 billion trade deficit in electronics could worsen before improving.
- **Longer decoupling timeline**: Achieving self-reliance in electronics could take 5–7 years, even with aggressive policy support.

What India Can Do

- **High-level coordination**: Create a PMO-led inter-ministerial task force (similar to the 2019 PLI committee) to handle supply chain challenges across ministries and in close consultation with industry.
- **Diversify supply sources**: Build partnerships with Taiwan, Japan, South Korea, the US, and EU for critical minerals, components, and manufacturing equipment.
- **Strengthen domestic ecosystem**: Invest in R&D, skill development, and infrastructure for electronics and component manufacturing, not just assembly.
- **Accelerate PLI & allied policies**: Expand production-linked incentives beyond smartphones to semiconductors, components, and high-tech manufacturing.
- **Strategic stockpiling**: Maintain reserves of critical inputs (rare earths, key components) to withstand supply disruptions.
- **Global alliances**: Work with Quad, Indo-Pacific Economic Framework for Prosperity (IPEF), and other like-minded partners to reduce dependence on China for high-tech inputs.
- **Ease business bottlenecks**: Cut bureaucratic delays, improve logistics, and address "higher disabilities" in costs to make India more attractive for global value chains.

Employment Linked Incentive (ELI)

Syllabus Mapping: Indian Economy and issues relating to Growth, Development and Employment

Context

On **1 July 2025**, the Government of India approved the **Employment Linked Incentive (ELI) Scheme** with an outlay of **₹99,446 crore** to promote job creation, particularly in the manufacturing sector. While the scheme is positioned as a flagship intervention for employment generation, its design raises concerns about inclusivity, sectoral imbalance, and long-term sustainability.

Provisions of the ELI Scheme

- **Objective:** To promote employment generation, improve employability, and enhance social security across sectors, with a special focus on manufacturing.
- **Job Creation Target:**
  - Seeks to generate over **3.5 crore jobs** in 2 years.
  - Includes **1.92 crore first-time workers** entering the workforce.
- **Incentive Period:** Benefits applicable for jobs created between **1st August 2025 and 31st July 2027**.
- **Scheme Structure: Two Parts:**
  - **Part A: Incentives for First-Time Employees**
    - Applicable to employees newly registered with EPFO.
    - Eligible if salary is up to ₹1 lakh/month.
    - Benefit: One month's wage (up to ₹15,000) in **two installments**.
    - Payment through **Direct Benefit Transfer (DBT)** using Aadhaar-Based Payment System (ABPS).
  - **Part B: Support to Employers**
    - Incentivizes new employment creation in all sectors, especially manufacturing.
    - Employers get **up to ₹3,000 per employee/month** for **two years**, if employment is sustained for at least 6 months.
    - For the manufacturing sector, benefits are extended to the **third and fourth years**.
    - Payment made directly to **PAN-linked employer accounts**.
- **Focus Sector:** While applicable to all sectors, special incentives are provided to the **manufacturing sector** for long-term employment generation.

Issues with the Scheme

- **Employer-Centric Approach:** Strengthens employers' bargaining power rather than workers'.
  - Mimics subsidising capital, reinforcing **capital–labour asymmetry**.
- **Skill Mismatch Ignored:** Only **8.25%** of graduates in jobs matching their qualifications; **4.9%** of youth have formal vocational training.
  - Without skilling reforms, employers may absorb an **unprepared workforce**.
- **Exclusion of Informal Sector:** 90% of workers in the informal sector left out due to EPFO-linked design.
  - Risks widening the **formal–informal divide**.
- **Risk of Disguised Employment:** Possibility of reclassifying old jobs as new to claim subsidies.
- **Sectoral Bias:** Over-focus on manufacturing (<13% of employment share) despite falling employment elasticity.
  - Marginalises women, rural youth, and low-skilled workers concentrated in services/agriculture.

Alternatives & Way Forward

- **Strengthen Skilling Infrastructure**: Integrate vocational training, industry-linked curricula, and upskilling for low-skilled workers.
- **Job Quality & Security**: Ensure labour rights, social security, and collective bargaining power.
- **Inclusivity for Informal Sector**: Extend benefits to micro, small, and informal enterprises.
- **Diversified Sectoral Focus**: Encourage employment in services, agriculture, and green economy alongside manufacturing.
- **Long-Term Productivity Growth**: Shift from headcount-based incentives to sustainable employment strategies.
- **Education–Employment Alignment**: Reform higher education to meet labour market needs.

Indian Youth: A Solution For US Tariffs

Syllabus Mapping: Indian Economy and issues relating to Growth, Development and Employment

Context

- The recent U.S. decision to impose **50% tariffs on Indian imports**, including a 25% penalty linked to India's oil trade with Russia, threatens India's export competitiveness.
  - Since the U.S. is India's largest export market for textiles, pharmaceuticals, and IT services, such steep tariffs could aggravate India's **trade deficit, job losses, and farmer distress**.

Why This Is a Challenge for India

- **Erosion of competitiveness** – Indian goods become costlier than rivals from Vietnam or Bangladesh.
- **Export dependence** – U.S. is a major market for textiles, pharma, and services; higher tariffs hurt foreign exchange earnings.
- **Pressure on agriculture** – U.S. seeks dairy and farm access in return, threatening India's farmers.
- **Limited global market alternatives** – China dominates global exports (36% textiles vs. India's 4.4%).
- **Structural weakness** – India still relies on low-cost labor instead of technology-led competitiveness.

Why the China Model Cannot Be Replicated in India

- **Different Political Systems:** China's **authoritarian one-party state** enabled rapid decision-making, large-scale land acquisition, and suppression of dissent.
  - India's **democratic polity**, coalition politics, and federal structure make top-down execution much slower.
- **Export-Led Growth vs. Domestic Market Realities:** China relied on **low-cost manufacturing + exports to the West** for 3 decades.
  - With protectionism rising and Western demand stagnating, India cannot depend on the same path.
- **Land and Labor Constraints:** China built massive industrial zones by **easy land acquisition** and low-cost disciplined labor.
  - In India, land acquisition faces **legal, political, and social hurdles**; labor reforms are still incomplete.

Table 2: Shares (in %) of these countries in global exports of selected products, 2022

	China	U.S.	India
Textiles and clothing	36.3	3.5	4.4
Footwear	40.9	1.0	1.7
Metals	18.4	5.2	2.5
Chemicals	10.7	10.1	2.6
Machine and electrical equipment	24.9	7.0	0.9

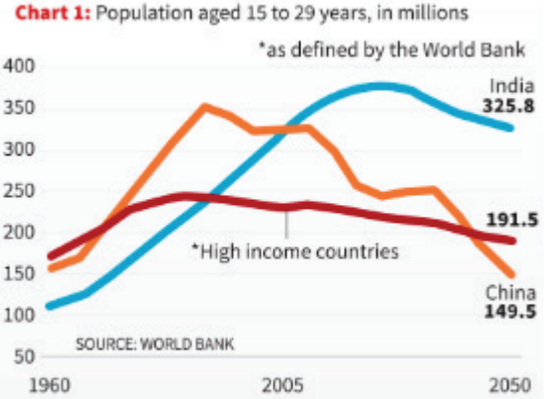
Source: WITS (World Integrated Trade Solution), The World Bank

- **Infrastructure Financing:** China financed growth through **state-led investment, high domestic savings, and debt-fueled infrastructure push**.
  - India's savings rate is lower, fiscal space is tighter, and public debt limits massive state-driven investment.
- **Demographic Timing:** China's demographic dividend peaked during its export boom.
  - India's youth bulge is happening when **global trade is slowing** and automation threatens low-skill jobs.
- **Innovation Ecosystem:** China quickly transitioned from "factory of the world" to **tech and R&D powerhouse** with state support.
  - India's **R&D spending is <1% of GDP** (vs. China's ~2.4%), and private sector participation is weak.

How Indian Youth Can Be the Solution

- **Demographic Dividend Advantage:** With **1 in 5 young people in the world living in India**, the youth can power domestic consumption and also form a skilled global workforce.
  - Unlike China's ageing population, India still has a **window of 2–3 decades** to leverage this advantage.
- **Skilled Workforce for Knowledge Economy:** Investing in **STEM education, digital skills, and vocational training** can turn India's youth into the backbone of IT, AI, green tech, and biotech industries.
  - This would help India move up the global value chain beyond low-cost manufacturing.
- **Boost to Domestic Demand:** Rising **youth wages and incomes** can create a large middle-class consumer base, reducing overdependence on exports to the U.S./Europe.
  - This supports the shift towards a **domestic demand–driven growth model**.

Chart 1: Population aged 15 to 29 years, in millions



- **Entrepreneurship & Start-up Ecosystem:** India already has the **3rd largest start-up ecosystem**, largely youth-led.
  - With policy support, young entrepreneurs can create jobs, innovate in sectors like fintech, agri-tech, health-tech, and reduce vulnerability to global tariff shocks.
- **Innovation & R&D:** Youth-led innovation in renewable energy, AI, pharmaceuticals, and space tech can reduce import dependence and strengthen global competitiveness.
  - India's **diaspora success story in the U.S.** shows what skilled youth can achieve with opportunities.
- **Soft Power & Global Influence:** India's young professionals abroad enhance **brain circulation**, global linkages, and India's reputation in technology and research.
  - Strategic use of this diaspora can strengthen India's bargaining power with the U.S. and others.

TOPICS FOR PRELIMS (ECONOMY)

Purchasing Managers' Index (PMI)

Context

India's manufacturing sector Purchasing Managers' Index (PMI) rose to a 16-month high of 59.1, up from 58.4 in June, despite global uncertainties and US tariffs, according to data released by S&P Global.

About Purchasing Managers' Index (PMI)

- It provides insights into the business conditions of the manufacturing and services sectors of an economy.
- It is calculated based on monthly surveys of private sector companies.
- The index offers information about new orders, production, employment, supplier deliveries, and inventory levels.
- **S&P Global**, a leader in financial information and analytics, **releases PMI data for India.**
  - **Previously, IHS Markit** issued this data before merging with S&P Global.
- **Methodology:** Derived from qualitative questions sent to manufacturing firms.
  - Consider **five key aspects** with assigned weights: new orders (30%), output (25%), employment (20%), suppliers' delivery times 15%), and stock of items purchased (10%).
- **Conducted monthly**.
- **How is PMI Interpreted?:**
  - A PMI above 50 indicates expansion in the sector it measures.
  - A PMI below 50 suggests contraction.
  - The further away from 50, the greater the degree of change.
- **Types of PMI:**
  - **Manufacturing PMI:** Focuses on conditions within the manufacturing sector.
    - Reflects the health of the manufacturing industry and is often used to gauge factory output.
  - **Services PMI:** Represents the services sector.
    - Useful for understanding the performance of services industries like finance, IT, hospitality, and others.

Significance

- Released earlier than most official industrial, manufacturing, and GDP growth data.
- Acts as a leading economic activity indicator.
- Used by central banks for interest rate decisions.
- Indicates corporate earnings, influencing investor and bond market interest.
- A strong PMI can enhance a country's economic attractiveness compared to others.

Bond Switching

Context

The Indian government has saved ₹560 crore in interest costs in the current **FY 2026**, by switching short-term bonds to longer-term securities—extending its debt maturities and reducing immediate repayment and interest pressure.

About Bond Switching

- **Definition**: Bond switching is when the government (through the RBI) exchanges existing bonds for new ones with different maturities, coupon rates, or both.
- **Purpose**: Mainly used to **extend debt maturity**, **manage redemption pressure**, and **reduce interest costs**.
- **Mechanism**:
  - The government offers to swap short-term bonds nearing maturity for longer-term securities.
  - Investors (like banks, mutual funds, insurers) exchange their holdings voluntarily.
- **Benefits to Government**:
  - Spreads out repayment obligations over a longer period.
  - Reduces the immediate cash outflow and can lower average borrowing costs.
  - Smoothens the debt maturity profile, avoiding large repayment spikes.
- **Benefits to Investors**:
  - Provides flexibility to align portfolios with investment goals.
  - Can help lock in favorable yields for a longer term.

- **Risks/Considerations**:
  - Market demand for the switch depends on yield curve conditions.
  - If interest rates rise, investors might be reluctant to accept longer maturities.
- **Example**: In FY 2026 (so far), bond switching saved the Indian government **₹560 crore** in interest costs compared to ₹54 crore in the same period last year.

Vostro Accounts

Context

India's RBI allowed 'vostro' accounts to invest entire surplus in government securities

What is a Vostro Account?

- It is a type of bank account that one bank holds **on behalf of a foreign bank** in the **domestic currency** of the country where the account is maintained.
- **E.g.,** Bank of America opens an INR account with SBI in India.
- **RBI** (not Ministry of Finance) issued the **operational guidelines**.
- **Benefits:**
  - Reduces forex reserve pressure.
  - Promotes INR as an international settlement currency.
  - Helps continue trade with sanctioned/restricted countries (e.g., Russia under sanctions).

Other Type of Accounts for International Transaction

Type of Account	Meaning	Example	Currency Denomination
Nostro Account	Account of a **domestic bank** maintained with a **foreign bank** in the **foreign currency**.	SBI opens USD account with Bank of America in USA.	Foreign currency (e.g., USD)
Loro Account	Account maintained by **one domestic bank** with another domestic bank, **on behalf of a third bank**, in foreign currency.	Canara Bank uses Bank of Baroda's Nostro account with National Bank of Hong Kong.	Foreign currency

Liquidity Management Framework

Context

The **Reserve Bank of India** published the Report of the Internal Working Group to Review the Liquidity Management Framework—an analysis of how India's central bank conducts and fine-tunes liquidity operations.

RBI's Liquidity Management Framework (LMF)

- It is the RBI's toolkit to regulate the cash/liquidity in the banking system.
- It helps steer **short-term interest rates** and ensures **smooth monetary policy transmission**.
- **Core Mechanism:**
  - Relies on the **Liquidity Adjustment Facility (LAF)** – using **repo** (inject liquidity) and **reverse repo** (absorb liquidity).
  - Operates within a **corridor system** where the **policy repo rate** is the midpoint.
  - The **Weighted Average Call Rate (WACR)** is the key operating target.
- **Other Tools in LMF:**
  - **Open Market Operations (OMO)**
  - **Cash Reserve Ratio (CRR)**
  - **Statutory Liquidity Ratio (SLR)**
  - Used for longer-term and structural liquidity adjustments.

RBI's Recent Recommendations on LMF (IWG Report, 2025)

- **WACR as Operating Target**
  - Continue using **overnight WACR** as the operating target.
  - **Reason:** Strong correlation with other overnight market rates → ensures effective transmission of policy signals.
- **Discontinue 14-Day VRR/VRRR as Primary Tool**
  - Replace with **7-day repo/reverse repo operations** and other tools (overnight to 14 days).
  - **Reason:** Banks show lower participation in 14-day auctions; shorter-tenor operations are more effective and less disruptive.
- **Advance Notice for Liquidity Operations**
  - RBI should provide **at least one day's notice** before repo/reverse repo auctions.
  - **Exception:** Same-day operations may be conducted if liquidity conditions change suddenly.
  - **Reason:** Helps reduce uncertainty and stabilizes money market rates.
- **Maintain Minimum CRR Requirement**
  - Continue with **90% daily minimum CRR maintenance**.
  - **Reason:** Ensures banks maintain adequate reserves and prevents liquidity shortfalls.

New GST Reforms

Context

The Centre has proposed a major **GST reform** by eliminating the **12% and 28% tax slabs**, retaining only 5% and 18% (with a

few special rates below 1% and a 40% "sin tax"), to simplify the system and boost consumption.

About GST (Goods and Services Tax)

- **Introduced:** 1st July 2017, replacing multiple indirect taxes (VAT, excise, service tax, etc.).
- **Nature:** A **destination-based, comprehensive indirect tax** levied on supply of goods and services across India.
- **Structure:**
  - **CGST (Central GST)** – collected by the Centre.
  - **SGST (State GST)** – collected by the States.
  - **IGST (Integrated GST)** – collected on inter-state supplies & imports.
- **Key Features:**
  - "One Nation, One Tax, One Market."
  - Dual model – Centre and States share powers.
- Input Tax Credit (ITC) mechanism avoids cascading of taxes.

Recent GST Reforms (2025 Proposal)

- **Reduction of Slabs**
  - Current slabs: 0.25%, 3%, 5%, 12%, 18%, 28% + cess.
  - Proposed slabs: **<1% (for precious stones etc.), 5%, 18%, and 40% 'sin tax'**.
  - **12% and 28% slabs to be eliminated.**
- **Reclassification of Items**
  - **99% of items in 12% slab → shifted to 5% slab.**
  - **90% of items in 28% slab → shifted to 18% slab.**
  - Only **5–7 items (tobacco, gutka, luxury goods)** to remain under **40% sin rate**.
- **Impact on Consumption & Revenue**
  - Lower rates expected to **boost consumption, reduce tax evasion, and widen the tax net**.
  - Although revenue may dip initially, higher compliance and consumption likely to **raise revenues later**.
- **Relief on Aspirational Items**
  - Proposal to reduce GST on items like **air conditioners, white goods** (currently at 28%) to 18% → making them more affordable.
- **Ease of Compliance**
  - Use of **technology** to simplify GST registration.
  - **Pre-filled returns** to reduce errors and mismatches.
  - **Faster refunds** to improve cash flow for businesses.
- **Overall Aim**
  - To implement a **simpler, next-generation GST system**.
  - Promote **ease of living and ease of doing business**.
  - Expected to be deliberated in the **GST Council meeting (Sept–Oct 2025)** and rolled out within this financial year.

PM Jan Dhan Yojana

Context

As many as **23% of PM Jan Dhan Yojana (PMJDY) accounts are inoperative**, i.e., around **13.04 crore out of 56.03 crore accounts** (as of July 31, 2025), with **Uttar Pradesh** having the highest number.

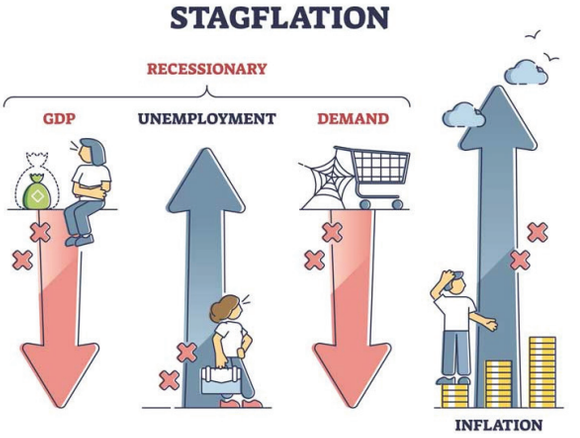
Pradhan Mantri Jan Dhan Yojana (PMJDY)

- **Launch Date:** August 28, 2014
- **Objective:** Financial inclusion by providing affordable access to banking, savings, remittance, credit, insurance, and pensions.
- **Significance:**
  - Backbone of many government economic schemes.
  - Facilitates Direct Benefit Transfers (DBTs).
- **Eligibility:**
  - Must be an Indian national.
  - Age: 18–59 years.
  - Minors above 10 years can open accounts with guardian support.
- **Features:**
  - **Zero-balance accounts:** No minimum balance requirement.
  - **RuPay debit card:** Comes with accident insurance.
  - **Insurance cover:**
    - Accident insurance up to ₹2 lakh.
    - Life insurance up to ₹30,000 (for first-time account holders).
  - **Overdraft facility:** Up to ₹10,000 per household.
    - Extra ₹5,000 loan after 6 months of satisfactory account activity.

Stagflation

Context

The threat of U.S. stagflation is unsettling global markets, prompting some investors to adjust their portfolios in anticipation of the economic strain that new tariffs could impose on growth and inflation in the world's largest economy.



Related Information

Inflation: It refers to a sustained rise in general level of prices over a period of time in the economy.
Deflation: Refers to a fall in the general level of prices over a period of time. (Negative rate of inflation)
Disinflation: slowing down of rate of inflation

What is Stagflation ?

- It is an economic situation characterised by **high inflation, slow economic growth, and high unemployment.**
- The term comprises the words **"stagnation"+ "inflation"**.

NPA & Pradhan Mantri Mudra Yojana

Context

The NPA rate of loans under the **Pradhan Mantri Mudra Yojana (PMMY)** for Scheduled Commercial Banks has increased to **9.81% in March 2025** from **5.47% in March 2018**.

About Non-Performing assets (NPA)

- It is a loan or advance for which the **principal or interest payment** remains **overdue** for a period of **90 days.**
- **Classification (as per the RBI guidelines):**
  - **Substandard assets**:Assets which have **remained NPA for a period less than or equal to 12 months.**
  - **Doubtful assets**: An asset that has remained in the **substandard category for a period of 12 months.**
  - **Loss assets:** It is considered "**uncollectible" or of such little value** that its continuance as a bankable asset is not warranted, although there may be some recovery value.
- **Metrics that help us to understand the NPA situation of any bank:**
  - **Gross NPA:** It refers to the total NPAs of the banks.
  - **Net NPA:** Net NPA is calculated as Gross NPA -Provisioning Amount.
    - **i.e.** Net NPA gives the exact value of NPAs after the bank has made specific provisions for it.

What is Provisioning?

- Provisioning is a mechanism to counter bad assets.
- Under provisioning, banks have to set aside or provide funds to a prescribed percentage of their bad assets.
- The percentage of bad assets that has to be 'provided for' is called provisioning coverage ratio.

Special Mention Accounts (SMA)

- **Introduced by** the RBI
- **What is it?:** These are the accounts that have **not-yet turned NPAs** but rather these accounts can **potentially become NPAs in future** if no suitable action is taken.
- **Purpose**: To identify emerging stress in the assets of banks and NBFCs.
- **Categories**:
  - **SMA-0:** Principal or interest payment not overdue for more than 30 days but account showing signs of incipient stress.
  - **SMA-1:** Principal or interest payment overdue between 31-60 days.
  - **SMA**-2: Principal or interest payment overdue between 61-90 days.

Related Information

- **Written Off Assets:** Assets which are not counted by the lender or Banks for balance sheet purposes. Loan write off does not mean loan waive off. It is majorly a balance sheet correction activity carried out by banks.
- **Slippage Ratio:** It is the rate at which good loans are turning bad.
- **Provisioning Coverage Ratio (PCR):** A certain percentage of a bank's profits to cover risk arising from NPAs.

About PM Mudra Yojna (PMMY)

- Launched in 2015, for providing loans up to Rs. 10 lakh to the **non-corporate, non-farm small/micro-enterprises.**
- **Funding Provision:**
  - MUDRA stands for **Micro Units Development & Refinance Agency Ltd.**, is a financial institution set up by the Government.
  - These loans are given by Commercial Banks, RRBs, Small Finance Banks, MFIs and NBFCs.
  - MUDRA does not lend directly to micro-entrepreneurs/ individuals.
  - Three products are created under MUDRA, as per the stage of growth and funding needs of the beneficiary micro unit.
    - **Shishu:** up to ₹ 50,000.
    - **Kishore:** ₹ 50,000 - ₹ 5 lakh.
    - **Tarun:** ₹ 5 lakh - ₹ 10 lakh.

  - **Tarun Plus:** ₹10 lakh - ₹20 lakh (It would be available to entrepreneurs who have availed and successfully repaid previous loans under the Tarun category).
- The guarantee coverage loans for amounts up to ₹20 lakh will be provided under the **Credit Guarantee Fund for Micro Units (CGFMU).**
  - CGFMU is a government-backed initiative aimed at providing credit guarantee coverage to loans extended to micro-enterprises and small businesses.
  - Established in 2015, this fund is managed by the **National Credit Guarantee Trustee Company Ltd. (NCGTC).**
- Loans under the MUDRA scheme are collateral-free loans.

TOPICS FOR MAINS (AGRICULTURE)

PM Dhan Dhaanya Krishi Yojana

Syllabus Mapping: Schemes for Agriculture

Context

The **PM Dhan Dhaanya Krishi Yojana (PMDDKY)** was approved as part of the Union Budget 2025–26, with a **six-year implementation period starting from FY 2025–26.** Aimed at uplifting agriculture and allied sectors in 100 underperforming districts, addressing challenges like low yields, water scarcity, and limited resource access.

Overview of the Scheme

- **Inspiration and Focus**:
  - Draws inspiration from NITI Aayog's Aspirational Districts Programme, focusing exclusively on agriculture and allied sectors.
  - Targets 100 districts with low agricultural performance to enhance productivity, resource access, and sustainability.
- **Core Objective**:
  - Tackle issues such as low crop yields, water scarcity, and inadequate access to financial and technological resources.
  - Promote holistic development of agriculture in underserved regions through targeted interventions.

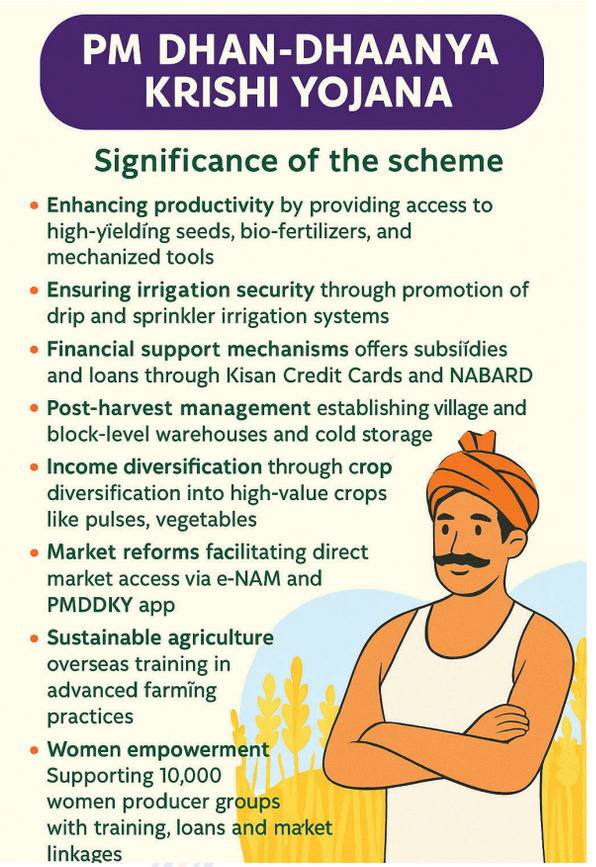
Key Features of PMDDKY

- **Financial Commitment**:
  - Allocated ₹24,000 crore annually for six years, starting from FY 2025–26, to support comprehensive agricultural development.
- **Implementation Framework**:
  - Managed by the Ministry of Agriculture and Farmers' Welfare with a three-tier monitoring structure:
    - **National-Level Oversight Bodies**: Provide strategic guidance and policy alignment.
    - **State-Level Nodal Committees**: Coordinate implementation and ensure state-specific customization.
    - **District Dhan Dhaanya Samitis**: Chaired by District Collectors, responsible for developing District Agriculture & Allied Activities Plans through extensive stakeholder consultations.
  - NITI Aayog to guide and review district plans, with Central Nodal Officers appointed for each district to conduct regular progress assessments.
- **Convergence Approach**:
  - Integrates 36 existing agricultural schemes across 11 ministries, including PM-KISAN and PM Fasal Bima Yojana (PMFBY).
  - Incorporates state-level schemes and fosters partnerships with private sector entities for resource optimization.
  - Employs a saturation-based model to ensure comprehensive coverage and effective delivery of benefits.
- **Monitoring and Evaluation**:
  - Tracks progress in each Dhan-Dhaanya district using 117 Key Performance Indicators (KPIs) to measure agricultural and allied sector outcomes.
  - Ensures transparency through a digital dashboard, a dedicated farmer app, and a district ranking system for performance comparison.

- **District Selection Criteria**:
  - NITI Aayog to finalize **100 districts** based on the following parameters:
    - **Low Crop Productivity**: Districts with crop yields below national averages.
    - **Moderate Cropping Intensity**: Cropping intensity below the national average of 155%.
    - **Low Credit Access**: Limited penetration of bank loans or Kisan Credit Cards among farmers.
    - **Geographic Representation**: Ensures inclusion of at least one district from each state and Union Territory for equitable coverage.

Significance of PMDDKY

- **Enhancing productivity:** Provides farmers with access to high-yielding seeds, bio-fertilizers, and mechanized tools to boost agricultural output.
- **Ensuring irrigation security:** Promotes drip and sprinkler irrigation systems, ensuring reliable year-round water availability in drought-prone regions.
- **Financial support mechanisms:** Offers subsidies and easy credit access through Kisan Credit Cards and NABARD loans for purchase of modern inputs and machinery.
- **Post-Harvest management:** Establishes village and block-level warehouses and cold storage facilities to minimize crop wastage and post-harvest losses.
- **Income diversification:** Encourages crop diversification into high-value crops like pulses, vegetables, and fruits to improve farmer income.
- **Market reforms:** Facilitates direct market access via e-NAM and PMDDKY app, reducing dependence on middlemen and ensuring fair prices.
- **Sustainable Agriculture:** Promotes organic fertilizers, water-efficient irrigation, and climate-resilient crops to ensure long-term sustainability.
- **Capacity building and training:** Organizes workshops by KVKs, agricultural universities, and private players to train farmers in modern farming and allied activities.
- **Global exposure:** Provides fully funded overseas training in advanced techniques like drip irrigation (Israel), greenhouse farming (Netherlands), and precision farming (Japan).



- **Women Empowerment:** Supports 10,000 women producer groups with training, loans, and market linkages in activities such as dairy farming and organic cultivation.

Conclusion

PMDDKY stands as a flagship initiative aimed at revitalizing Indian agriculture, directly impacting 1.7 crore farmers across 100 underperforming districts. By strengthening irrigation, storage, credit, training, market access, and modern technology, the scheme empowers smallholders, women, and youth, thereby promoting sustainable and remunerative farming practices.

Role of M.S Swaminathan in Indian Agriculture

Syllabus Mapping: Role of prominent personalities in Indian agriculture

Context

On **August 8, 2025,** the Prime Minister of India inaugurated the **MS Swaminathan Centenary International Conference,** commemorating the 100th birth anniversary of the legendary agricultural scientist, **Prof. MS Swaminathan (1925–2023)**. The conference, themed **"Evergreen Revolution, The Pathway to Biohappiness,"** celebrates his lifelong commitment to food security, sustainable agriculture, and rural development.

About MS Swaminathan

Prof. Monkombu Sambasivan Swaminathan was a pioneering Indian geneticist and agricultural scientist, widely regarded as the **Father of the Green Revolution in India**. His transformative contributions reshaped global agriculture, ensuring food security for millions. Below is an overview of his illustrious career and accolades:

- **Key Recognitions**:
  - **Ramon Magsaysay Award** (1971) for community leadership.
  - **First World Food Prize** (1987) for contributions to global agriculture.
  - **UNEP Sasakawa Environment Prize** (1994) for sustainable development.
  - **UNESCO Gandhi Gold Medal** (1999) for promoting peace through agriculture.
  - **Bharat Ratna** (2024, posthumously), India's highest civilian honor.
- **Key Roles**:
  - Member of the **Planning Commission** (1980–82).
  - Chaired the **UN Commission on Science and Technology for Development**.
  - Director General of the **International Rice Research Institute** (IRRI), Philippines.
  - Founder of the **M. S. Swaminathan Research Foundation (MSSRF)**, dedicated to sustainable agriculture and rural development.

Key Contributions to Agriculture

Prof. Swaminathan's work revolutionized agricultural practices, particularly in India, through innovative techniques and policies. His major contributions include:

Development of High-Yield Varieties

- **1950s**: Developed frost-resistant potato hybrids and crossed fragile **indica** rice with hardier **japonica** varieties, creating robust, high-yield rice strains.
- **1963**: Collaborated with Norman Borlaug to incorporate dwarfing genes into wheat, resulting in shorter, stronger plants with significantly higher yields.

Father of the Green Revolution

Starting in the 1960s, Swaminathan spearheaded India's Green Revolution, a transformative movement that increased food production through:

- Adoption of advanced breeding techniques.
- Use of modern agricultural technologies, including high-yield seeds, fertilizers, and irrigation systems.

Crop Cafeterias

Swaminathan introduced the concept of **crop cafeterias**, where diverse crop varieties are grown together to:

- Provide a balanced diet.
- Improve nutritional outcomes for communities.

Crop Distribution Agronomy

He advocated for a dynamic approach to crop management, allowing midseason adjustments in crop selection and planting to:

- Optimize yield.
- Enhance food quality and resilience to environmental changes.

National Commission on Farmers

As the chair of the **National Commission on Farmers**, Swaminathan submitted the influential **Swaminathan Report**, which outlined strategies to:

- Enhance productivity, profitability, and sustainability of Indian farming systems.
- Address challenges faced by farmers, including economic and environmental concerns.

The Evergreen Revolution: A Vision for Sustainable Agriculture

Prof. Swaminathan coined the term **Evergreen Revolution**, emphasizing the need to increase agricultural productivity in perpetuity without causing ecological harm. The key components of this vision include:

- **Organic and Green Agriculture**:
  - Promotion of integrated pest management, nutrient supply, and natural resource management.
  - Focus on environmentally friendly farming practices.
- **Village Knowledge Centres:** Providing time- and location-specific information on crops, animal husbandry, and other agricultural practices to empower rural communities.

- **Biovillages**:
  - Sustainable management of natural resources.
  - Support for both on-farm and non-farm livelihoods to ensure economic stability.
- **Social, Economic, and Gender Equity**:
  - Ensuring inclusive agricultural development that addresses disparities and promotes fairness across all sections of society.

Legacy and Impact

The MS Swaminathan Centenary International Conference serves as a tribute to his enduring legacy. His vision of an **Evergreen Revolution** continues to inspire global efforts toward sustainable agriculture, food security, and biohappiness. Through institutions like the MSSRF and his groundbreaking contributions, Prof. Swaminathan's work remains a cornerstone of modern agricultural science.

Conclusion

The conference, held on his 100th birth anniversary, underscores the importance of continuing his mission to create a sustainable and equitable future for agriculture worldwide.

Cotton Import Duty Suspension in India

Syllabus Mapping: Major Crops - Cropping Patterns in various parts of the country

Context

India's textile industry, a vital economic driver employing over **45 million people** and supported by n**early six million cotton farmers,** faces challenges due to declining domestic cotton production. To address this, the Indian government suspended the **11% import duty on cotton from August 19, 2025, until December 31, 2025,** extending the initial **deadline of September 30, 2025.**

Historical context of Cotton Import Duty

- **Introduction of Duty in 2021**:
  - Announced in the 2021 Union Budget with an 11% import duty (5% basic customs duty, 5% agriculture infrastructure and development cess, 1% social welfare surcharge).
  - Implemented when domestic production was 350 lakh bales annually, exceeding demand of 335 lakh bales.
  - Aimed to protect cotton farmers by discouraging imports, as India was a net cotton exporter.
- **Temporary Exemptions in 2022**:
  - Duty waived from April to September 2022 due to raw material shortages in the textile industry.
  - Extended until October 2022 to stabilize supply for mills and support export competitiveness.
  - Duty reinstated post-October 2022, expecting recovery in domestic production.
- **Recent Production Decline**:
  - 2024-25 season production dropped to 294 lakh bales, a 15-year low, against a demand of 318 lakh bales (including non-mill use).
  - Shortfall prompted renewed calls for duty suspension to ensure raw material availability.

Surge in Cotton Imports

- **Significant Import Growth**:
  - Imports surged 107.4% in FY 2024-25, rising from $579.2 million to $1.20 billion, per the Global Trade Research Initiative.
  - Projected imports for 2024-25: 40–42 lakh bales to bridge the production-demand gap.
- **Key Importing Countries**:
  - Australia: $258.2 million.
  - United States: $234.1 million.
  - Brazil: $180.8 million.
  - Egypt: $116.3 million.
- **Reasons for Increased Imports**:
  - Domestic production shortfall of 24 lakh bales in 2024-25.
  - Rising global cotton prices and demand for high-quality imported cotton by textile mills.

Impact of Duty Suspension

- **Benefits for Textile Industry**:
  - Eliminates 11% import duty (5% basic customs duty, 5% agriculture cess, 1% surcharge), reducing raw material costs.
  - Stabilizes domestic cotton prices, benefiting production of apparel like T-shirts and handloom sarees.
  - Supports small and medium enterprises (SMEs) facing high input costs.
  - Enables duty-free entry of approximately two lakh bales in transit, enhancing cost efficiency.
- **Boost for Export Competitiveness**:
  - Addresses challenges from 60% U.S. tariffs on Indian apparel (vs. 20% for Bangladesh and Vietnam).
  - Reduces raw material costs, helping exporters compete in global markets.
  - Encourages global brands to source from Indian suppliers using imported cotton.
- **Strategic Timing and Trade Dynamics**:
  - Aligns with the non-peak season (April–September), minimizing competition with domestic harvests.
  - Coincides with southern hemisphere crop arrivals from Australia and Brazil.
  - Seen as a diplomatic gesture toward the U.S., a key supplier, amid trade tensions over India's Russian oil purchases.

Challenges for Cotton Farmers

- **Farmer Concerns**:
  - Duty suspension may depress local cotton prices, particularly during harvest season.
  - Farmers, especially in regions like Vidarbha, Maharashtra, fear reduced incentives for cotton cultivation.
  - Policy perceived as prioritizing manufacturers over growers, impacting rural livelihoods.
- **Government Support Measures**:
  - Cotton Corporation of India (CCI) procured 100 lakh bales at Minimum Support Price (MSP), costing ₹37,500 crore.
  - CCI sold 73 lakh bales to stabilize market prices.
  - MSP for 2025-26 season (starting October 1) increased by 8% to support farmer incomes.
  - Fresh cotton supplies expected from northern states in October and central/western states post-Deepavali.

Long-Term Solutions for the Cotton Sector

- **Policy Stability**:
  - Implement seasonal duty suspensions (April–September) to ensure mills access affordable cotton without affecting farmers' peak harvest sales.
  - Reinstate duties during peak season (October–March) to protect domestic growers.
- **Financial Support for Textile Mills**:
  - Provide 5% interest subvention on working capital for MSMEs to procure cotton during peak season.
  - Enable mills to stockpile cotton, reducing dependence on costly MSP operations by the CCI.
- **Strengthening MSP and Farmer Support**:
  - Enhance MSP mechanism to ensure stable farmer incomes amidst import fluctuations.
  - Promote sustainable farming practices, such as improved seed varieties and irrigation, to boost domestic production.
- **Research and Development**:
  - Invest in high-yield, pest-resistant cotton varieties to reduce reliance on imports.
  - Support farmer training programs to improve productivity and resilience to climate challenges.

Conclusion

- **Balancing Stakeholder Interests**:
  - The duty suspension addresses immediate textile industry needs by lowering raw material costs and enhancing export competitiveness.
  - However, it raises valid concerns among farmers about the long-term viability of cotton cultivation.
- **Path Forward**:
  - A balanced approach with seasonal duty policies, financial support for mills, and robust MSP mechanisms can align the interests of farmers and manufacturers.
  - Investments in sustainable farming and research will strengthen India's cotton sector, ensuring its global leadership in textiles while safeguarding rural livelihoods.

Fertilizer sector in India

(Syllabus Mapping: Issues related to Direct and Indirect Farm Subsidies and Minimum Support Prices; Public Distribution System)

Context

- **Parliamentary Committee's Call for Strategic Status**:
  - Parliamentary committee has urged reclassification of the fertilizer sector as **'strategic' to align with Atmanirbhar Bharat's self-reliance goals.**
  - Criticized the **'non-strategic'** status as inconsistent with the sector's role in addressing food security and import dependency.
- **Context of Rising Import Dependence**:
  - Highlighted India's reliance on imports: **25% for urea, 90% for phosphates, and 100% for potash.**
  - Emphasized the need for robust domestic production to ensure price stability and disaster resilience.

Parliamentary Committee observations and recommendations

Observations

- **Link to Food Security**:
  - Fertilizers are vital for agricultural productivity and India's food sovereignty.
  - **High import dependency** (25% urea, 90% phosphates, 100% potash) underscores the need to strengthen fertilizer Public Sector Undertakings (PSUs).
  - Domestic production is critical for price stability, disaster resilience, and long-term food security.
- **DIPAM's Stance**:
  - Denied strategic status to the fertilizer sector despite its critical role in agriculture.
  - Argued that PSUs contribute only 25% of urea and 11% of non-urea fertilizer production, with many operating at a loss.
- **Low PSU Market Share**:
  - The private sector dominates with 57.77% of total fertilizer production in 2023–24.
  - PSUs account for 17.43% of production, while cooperatives contribute 24.81%.
  - PSUs act as price stabilizers, ensuring affordable fertilizers for small and marginal farmers through subsidized distribution.
- **Need for Strategic Classification**:
  - Strategic status would prioritize sustained investment and policy support.
  - Aligns with Atmanirbhar Bharat's goal of reducing reliance on imports and enhancing national resilience.

Recommendations

- **Policy Support for Strategic Status**:
  - Reclassify the fertilizer sector as **'strategic'** to attract long-term investment and policy alignment.
  - Ensure coherence with national self-reliance and food security objectives.
- **Revitalizing Fertilizer PSUs**:
  - Launch a dedicated mission to upgrade PSU technology, diversify product offerings, and adopt sustainable practices.
  - Highlighted successful turnaround of revived PSUs, contributing **7.62 million tonnes (MT) to annual urea production.**
  - Reopen closed units to boost domestic production capacity.
- **Enhancing PSU Efficiency**:
  - Address raw material constraints, pricing mismatches, and outdated technology in PSUs.
  - Promote modernization to improve operational efficiency and competitiveness.

Role of Fertilizers in India's Agriculture and Economy

- **Agriculture's Economic Significance**:
  - Contributes nearly 16% to India's GDP.
  - Supports livelihoods of over 46% of the population, forming a backbone of economic stability.
- **Fertilizer Production Trends**:
  - **India is the second-largest fertilizer consumer and third-largest producer globally.**
  - Production increased from **385.39 Lakh Metric Tonnes (LMT) in 2014–15 to 503.35 LMT in 2023–24.**
  - Sector breakdown in **2023–24: Private sector (57.77%), cooperatives (24.81%), public sector (17.43%).**

- **Consumption and Import Dependency:**
  - In 2023–24, India consumed 601 LMT of fertilizers, with 503 LMT produced domestically and 177 LMT imported.
  - S**elf-sufficiency levels:** 87% for urea, 90% for NPK (nitrogen, phosphorus, potassium), 40% for DAP (Di-Ammonium Phosphate), and 0% for Muriate of Potash (MOP).
- **Economic Implications**:
  - High import dependency exposes India to global price volatility and supply chain disruptions.
  - PSUs play a critical role in stabilizing prices for farmers, particularly through subsidized distribution.

Evolution towards Sustainability and Self-Reliance

- **Brand Unification under ONOF**:
  - **One Nation One Fertilizer (ONOF)** initiative standardizes subsidized fertilizers as **'Bharat Urea', 'Bharat DAP', etc.**
  - Ensures uniform quality, eliminates branding confusion, and reinforces government support.
- **Sustainable Fertilizer Practices**:
  - **Nano-Fertilizers**: Nano urea and nano DAP use encapsulated nutrients for slow release, improving absorption and reducing wastage.
  - **Neem-Coated Urea (NCU)**: Enhances nitrogen efficiency, requiring ~10% less urea, minimizing losses and improving soil health.
  - **PM-PRANAM Scheme**: Promotes reduced chemical fertilizer use, incentivizing states to adopt organic alternatives.
  - **Bio-Fertilizers and Soil Health Cards**: Encourage balanced nutrient management and tailored soil diagnostics for sustainable farming.
- **Technological and Digital Infrastructure**:
  - **Integrated Fertilizer Management System (iFMS)**: Enables real-time tracking of fertilizer movement from production to retail.
  - **Mobile Fertilizer Management System (mFMS)**: Supports dealer registration, stock monitoring, and Direct Benefit Transfer (DBT) through mobile-accessible dashboards.
- **Government Initiatives**:
  - Long-term DAP supply agreements with Saudi Arabia and Morocco to diversify import sources.
  - Promotion of nano-fertilizers to reduce subsidy burden and import dependency.

Challenges in categorizing the Fertilizer Sector as Strategic

- **Global Integration and Supply Diversification**:
  - Long-term import agreements reduce the urgency for large domestic strategic reserves.
  - Dependence on countries like Saudi Arabia and Morocco for phosphates limits self-reliance potential.
- **Technological Obsolescence in PSUs**:
  - Older PSU plants face low efficiency and high input costs due to outdated technology.
  - Require significant capital investment for modernization, raising questions about cost-effectiveness.
- **Operational Constraints**:
  - Some PSUs operate at sub-optimal capacity due to raw material shortages, pricing mismatches, and inefficiencies.
  - Challenges in competing with the private sector, which dominates production.
- **Policy Inconsistency**:
  - The Agriculture Ministry views fertilizers as essential for food security, while DIPAM classifies the sector as non-strategic.
  - This ambiguity creates inter-ministerial conflicts and slows reform momentum.
- **Economic Viability Concerns**:
  - High production costs in PSUs compared to import parity prices question the rationale for strategic classification.
  - Subsidy dependence discourages efficiency improvements in PSUs.

Strategies for a Self-Reliant Fertilizer Sector

- **Boost Domestic Production**:
  - Implement New Investment Policy (NIP) 2012 to ensure profitable operation of existing units.
  - Revive closed fertilizer plants to increase domestic output and reduce import reliance.

- **Promote Innovation and Sustainability**:
  - Invest in R&D for eco-friendly fertilizer formulations, such as bio-fertilizers and nano-fertilizers.
  - Scale up PM-PRANAM Scheme and Pradhan Mantri Kisan Samridhi Kendras (PMKSKs) to promote sustainable practices.
- **Encourage Public-Private Collaboration**:
  - Foster partnerships to drive innovation, attract investment, and expand production capacity.
  - Leverage private sector expertise to complement PSU efforts.
- **Establish Regional Manufacturing Hubs**:
  - Create fertilizer production clusters near key agricultural zones to reduce logistics costs.
  - Ensure faster and more efficient distribution to farmers.
- **Financial Incentives**:
  - Introduce a Production Linked Incentive (PLI) scheme for nano-fertilizer production to boost manufacturing.
  - Integrate nano-fertilizers into national nutrient management programs to reduce import dependency.
- **Farmer Education and Awareness**:
  - Use digital platforms like iFMS and mFMS to disseminate information on balanced fertilizer use.
  - Promote soil health management and benefits of organic and bio-fertilizers through localized campaigns.

Conclusion

- **Strategic Importance of Fertilizers**:
  - The fertilizer sector is indispensable for India's food security and economic stability, supporting 46% of the population.
  - High import dependency and global price volatility necessitate a shift towards self-reliance.
- **Path to Self-Reliance**:
  - Reclassifying the sector as 'strategic' would prioritize investment, modernization, and sustainable practices.
  - Revitalizing PSUs, promoting innovation, and fostering public-private partnerships are critical steps.
- **Balancing Challenges and Opportunities**:
  - Addressing technological obsolescence and policy inconsistencies is essential for meaningful reform.
  - By integrating nano-fertilizers, bio-fertilizers, and digital tools, India can build a resilient, sustainable fertilizer sector aligned with Atmanirbhar Bharat's vision.

TOPICS FOR PRELIMS (AGRICULTURE)

Pradhan Mantri Kisan Sampada Yojana (PMKSY)

Context

The Union Cabinet increased the budget for **PMKSY** by ₹1,920 crore to ₹6,520 crore to strengthen the food processing sector through new irradiation units and food testing labs.

Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)

- Initially approved as a **Central Sector Scheme** named **SAMPADA (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters)**.
- Approved by the **Union Cabinet in May 2017** for the **14th Finance Commission cycle (2016–2020)**.
- The scheme has now been **renamed** as **Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)**.
- **Ministry**: Ministry of Food Processing Industries (MoFPI)
- It is a **comprehensive umbrella scheme** aimed at boosting the food processing sector in India.

Objectives

- **Modernise infrastructure** in food processing
- **Reduce post-harvest losses**
- **Improve value addition** in agricultural produce
- **Boost farmer income**
- Create **modern supply chains** from farm gate to retail
- Ensure **better price realization** for farmers

Key Components / Sub-schemes

- **Mega Food Parks**
- **Integrated Cold Chain and Value Addition Infrastructure**
- **Food Safety and Quality Assurance Infrastructure**
- **Infrastructure for Agro-processing Clusters**
- **Backward & Forward Linkages**
- **Creation/Expansion of Food Processing and Preservation Capacities**
- **Operation Greens** – to stabilize supply of Tomato, Onion, Potato (TOP)

Recent Developments (2025)

- **Budget increased** by ₹1,920 crore → Total outlay now **₹6,520 crore**
- Funds to be used for:
  - **50 multi-product food irradiation units**
  - **100 food testing labs**

Benefits & Impact

- Reduces **agri-wastage**
- Increases **farm-level income**
- Enhances **food exports**
- Promotes **entrepreneurship** in rural areas
- Creates **employment** in food processing sector
- Improves **food safety and quality standards**

Pradhan Mantri Matsya Kisan Samrudhi-Sah Yojana (PM-MKSSY)

Context

Karaikal, Puducherry, is in news as it will soon get its **first state-of-the-art fisheries** processing cluster under the Pradhan Mantri Matsya Sampada Yojana (PMMSY).

Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PM-MKSSY)

- It is a **Central Sector Sub-scheme** under the **Pradhan Mantri Matsya Sampada Yojana (PMMSY)**, spanning **FY 2023-24 to FY 2026-27** with a total budget of **₹6,000 crore**.
- **Funding Structure**
  - Total estimated outlay: **₹6,000 crore**, divided as follows:
    - **₹3,000 crore (public financing)**—comprising ₹1,125 crore from the **World Bank**, ₹375 crore from the **Agence Française de Développement (AFD)**, plus ₹1,500 crore as **GoI counterpart funding**.
    - **₹3,000 crore** expected from **beneficiary investments** and **private sector leverage**.
- **Duration & Coverage**
  - Duration: **Four years**, FY 2023-24 to FY 2026-27.
  - Applicable **nationwide**, across **all States and Union Territories**.
- **Beneficiaries**
  - **Fishers, aquaculture (fish) farmers, fish workers, fish vendors**, and others directly involved in the fisheries value chain.
  - **Micro and Small Enterprises (MSEs)**: including proprietary firms, partnerships, companies, societies, LLPs, cooperatives, SHGs, FFPOs, and startups related to fisheries/aquaculture.
- **Key Objectives:**
  - **Formalization of the unorganized fisheries sector** via the creation of **work-based digital identities** for fishers and enterprises through the **National Fisheries Digital Platform (NFDP)**.
  - **Facilitating access to institutional credit** for small microenterprises, enabling them to benefit from government lending schemes like KCC and Mudra.
  - Providing **one-time incentives** to aquaculture farmers for purchasing **insurance**, thereby mitigating risks.
  - **Performance-linked grants** to:
    - Improve **value chain efficiency** and create jobs across fisheries microenterprises.
    - Enhance **safety and quality assurance** of fish and fish products.

SOCIETY AND SOCIAL JUSTICE

TOPICS FOR MAINS

Organ transplantation in India

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

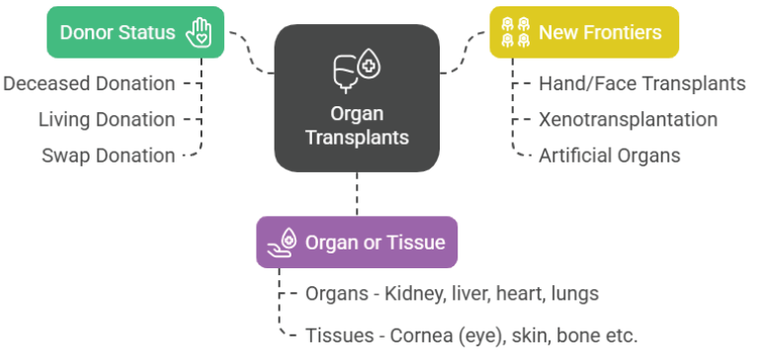
Context

India achieved a remarkable milestone of performing over 18,900 organ transplants in 2024, the highest ever recorded in a single year. It ranks third globally in the total number of organ transplants. However, despite this achievement, India continues to face several challenges in the field of organ transplantation.

About Organ Transplantation

- Organ transplantation is a medical process where an **organ or tissue from a donor** is taken and placed in a **recipient**, whose organ has failed.
- It is one of the most advanced forms of medical treatment, but also raises **ethical, legal, and social questions**.

Types of Organ Transplants



Organ transplantation in India

- **Current Status in India:**
  - **Transplants performed in 2024:** ~18,911 (all organs and tissues).
  - India is among the top 5 countries in absolute numbers but far behind in per million population rate.
  - **Living donation dominates**, especially for kidney and liver.
  - **Deceased donation rate is low** compared to Spain or the US.

Laws and Rules regulating organ donation in India

- **Transplantation of Human Organs and Tissues Act (THOTA), 1994 (amended 2011)**:
  - Recognises **brain-stem death** as legal death.
  - Defines who can donate (near relatives, swap donations).
  - **Bans sale/purchase** of organs (to stop exploitation of poor).
  - Introduced rules for **tissues** like cornea and skin.
- **Organ Donation Rules (2014):**
  - Hospitals must register for organ transplant.
  - Brain-death certification by a medical board.
  - Proper consent forms (Form 8, Form 10, etc.).
- **Punishment:** 5-10 years jail and ₹20 lakh - ₹1 crore fine for illegal trade.
- **Institutions:**
  - **NOTTO** (National Organ & Tissue Transplant Organisation) - central body, keeps national waiting list, makes policies.
    - **Nodal Ministry:** Ministry of Health and Family Welfare.
  - **ROTTO** (Regional level) and **SOTTO** (State level).

How Allocation Works

- **Organs are given to patients based on:**
  - **Urgency** (how sick the patient is, e.g., MELD score for liver).
  - **Compatibility** (blood group, tissue type).
  - **Waiting time** on the list.
  - **Special priority** for children and previous donors.
- Allocation is done through NOTTO's registry to ensure fairness.
- To save time, "**green corridors**" are created - police clear traffic to move organs quickly. Sometimes Air Force planes are used.

Ethical Dimensions of Organ Transplantation

- **Consent & Autonomy:** Donation must be **voluntary and informed**. Respecting the donor's **right to decide** about their body.
- **Justice & Fairness:** Distribution should be **need-based, not wealth-based**.
- **Dignity & Human Rights:** The human body must **not be treated as a commodity**.
- **Ban on Commercialisation:** Prevent exploitation of the poor by **organ brokers and trafficking networks**.
- **Accountability & Transparency:** Need for **robust oversight**, ethical review, and monitoring to prevent malpractice. Transparency in **waiting lists, donor consent, and hospital practices**.

Challenges in Organ Donation in India

- **Low Public Awareness & Myths:** Fear of body disfigurement affecting funeral rites.
  - Misbelief that organ donation violates religious norms.
  - Suspicion of premature brain death declaration for organ harvesting.
- **Illegal Organ Trade:** Despite strict laws, kidney rackets are reported.
- **Gender Inequality:** Women are the majority of living donors, but fewer women receive transplants.
- **Medical Infrastructure Gaps:** Not enough ICU facilities, transplant centres, and trained staff.
- **High Cost:** Surgery and lifelong medicines (immunosuppressants) are expensive.
- **Brain Death Concerns:** Misunderstanding of medical & legal safeguards under the **Transplantation of Human Organs and Tissues Act, 1994**.
  - Brain death is certified only after **strict legal, ethical, and multi-doctor procedures**.
- **Age & Health Misconceptions:** False belief that only young accident victims can donate.
  - **Reality:** Older donors, natural death cases, and donations of tissues (skin, bone, cornea, heart valves) are possible.
- **Insufficient Engagement of Medical Professionals:** Lack of training to counsel grieving families effectively.

Recent Developments in India

- **Online Pledge System:** Aadhaar-linked NOTTO portal allows people to pledge organs online.
- **Policy Reform (2023):** Removed age cap of 65 years for donation, and domicile restriction for waiting list.
- **State Success Story:** Telangana's **Jeevandan** programme has the **highest organ donation rate** in India.
- **Awareness Events: Indian Organ Donation Day** (August) and **World Organ Donation Day** (13 August).
- **Green Corridors:** Frequently used in metro cities to transport organs.

Way Forward

- **Improve Donor Identification and Certification:**
  - **Routine brain-death certification**: Every ICU should be mandated to certify brain-stem death whenever it occurs.
  - **Training doctors**: Many doctors are not confident in diagnosing brain death. Regular workshops and government-approved modules should be compulsory.
  - **Independent audits**: Hospitals should be audited to check if brain-death certification is being followed.
- **Use of Technology and Research:**
  - **Machine perfusion & better preservation** to keep organs viable for longer.
  - **Research on artificial/bio-engineered organs** – India should invest in this for the future.
  - **Digital health IDs** could link people's donation pledges to their Aadhaar or driving licence for quick identification.

- **Strengthen Deceased Donation System:**
  - **Expand DCD (Donation after Circulatory Death)**: India mainly uses brain-dead donors, but DCD can add more organs. Countries like the UK and Spain use this widely.
  - **Dedicated transplant coordinators** in every ICU to counsel families immediately after brain-death confirmation.
- **Make Organ Allocation Transparent and Fair:**
  - **National Online Registry**: A single waitlist for each organ, accessible in real-time, reducing chances of manipulation.
  - **Equity principles**: Priority for children, poor patients, and those who donated organs earlier.
  - **Special safeguards for women**: Because studies show women donate more but receive fewer organs, rules should ensure fairer access.
- **Improve Infrastructure and Logistics:**
  - **More transplant centres** in tier-2 and tier-3 cities, not just metros.
  - **Green corridors**: Standardise procedures in every state for fast movement of organs by road, air, rail, or even metro.
- **Tackle Illegal Organ Trade:**
  - **Strengthen Authorization Committees**: All unrelated donations must be video-recorded and verified by social workers.
  - **Digital record-keeping**: Prevents forged documents.
  - **International cooperation**: To stop cross-border transplant tourism.

Organ transplantation is a **life-saving medical advancement**, but India still faces **shortage of donors, ethical concerns, and infrastructural gaps**. Stronger laws, transparent allocation, public awareness, and new technology can make India self-sufficient in meeting organ transplant needs.

Stunting in India: A Persistent Development Challenge

Syllabus Mapping: GS-Paper 2, Social Justice, Health, Vulnerable sections

Context

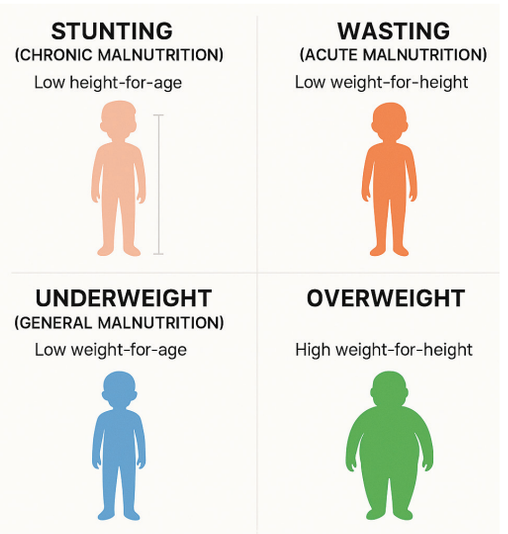
Despite progress, over one-third of Indian children under five remain stunted (NFHS-5), reflecting chronic malnutrition.

Data on Child Malnutrition

- **Stunting (Low Height-for-Age): 35.5%**, down from 38.4% in NFHS-4 (2015–16) .
- **Wasting (Low Weight-for-Height): 19.3%**, a decline from 21.0%.
- **Underweight (Low Weight-for-Age): 32.1%** (improvement from 35.8%).
- **Concurrent Wasting and Stunting (WaSt):** Approximately **5.2%** of children are both wasted and stunted simultaneously.

Why India's Stunting Crisis Persists

- **Maternal Health & Teenage Pregnancies:** Adolescent mothers are more likely to deliver **low-birth-weight babies**, perpetuating an intergenerational cycle of malnutrition.
  - **Eg: 7% of women (15–19 yrs)** had begun childbearing (NFHS-5).
- **Poor Maternal Nutrition & Anaemia:** Anaemia reduces women's productivity, creating a double economic and health burden. Micronutrient deficiencies (iron, folate, vitamin A, zinc) impair foetal growth and immunity.
  - **Eg:** 57% of women (15–49 yrs) and 67% of children under five are anaemic.
- **Inadequate Infant & Young Child Feeding:** Merely 11% of children (6–23 months) meet the minimum acceptable diet norms & Only **64% of infants are exclusively breastfed** for the first six months.
- **Poor Diet Quality:** Predominantly carbohydrate-heavy diets, low in protein and micronutrients.
  - **Eg:** Eggs, pulses, and dairy are often inaccessible in **Adivasi and low-income households**.
- **Educational Divide:** 46% of children born to mothers with no schooling are stunted vs. 26% among mothers with 12+ years of schooling.
- **Unsafe Sanitation & Water (WASH):** Enteric dysfunction and diarrhoeal diseases reduce nutrient absorption despite food availability.
  - **Eg:** 19% of households still practice open defecation.



- **Poverty & Inequality:** Poverty limits dietary diversity, access to healthcare, and education.
  - **Eg:** Multidimensional Poverty Index (MPI 2023): ~16% Indians are still poor.
- **Gender Discrimination:** In many households, **boys receive preferential nutrition** and healthcare over girls.
- **Health Infrastructure Gaps:** Anganwadi centres often lack trained staff, proper monitoring, or quality supplementary food.
- **Urban Malnutrition:** Urban slums show **hidden hunger** due to poor sanitation and junk-food-based diets.
- **Climate Change & Food Security:** Climate shocks (droughts, floods, heatwaves) disrupt agriculture and worsen food insecurity.
- **Governance & Policy Fragmentation:** Nutrition-related schemes (ICDS, Mid-Day Meals, Anaemia Mukt Bharat, Jal Jeevan Mission) work in silos with poor convergence.

Government Initiatives

- **POSHAN Abhiyaan (2018):** Focus on convergence, technology (Poshan Tracker App), and Jan Andolan (people's movement).
  - **Target:** Reduce stunting to **25% by 2022** (missed).
- **POSHAN 2.0 (2021 onwards):** Integrated scheme merging **Supplementary Nutrition Programme (SNP)** and **POSHAN Abhiyaan.**
- **Integrated Child Development Services (ICDS):** Provides supplementary nutrition, health check-ups, and pre-school education via Anganwadis.
  - World's largest community outreach program.
- **Mid-Day Meal Scheme → PM POSHAN (2021):** Provides hot cooked meals and nutrition to schoolchildren.
- **Anaemia Mukt Bharat (2018):** 6x6x6 strategy (six target beneficiaries, six interventions, six institutional mechanisms).
  - Mass iron-folic acid supplementation, deworming, diet diversification.
- **Food Fortification Initiatives:** Fortified rice, salt (iodine + iron), edible oil (Vitamin A, D).
  - Distribution via PDS, ICDS, and mid-day meals.
- **WASH-Linked Schemes:**
  - **Swachh Bharat Mission:** Open defecation free (ODF) villages.
  - **Jal Jeevan Mission:** Safe drinking water for all households.

Case Study – Odisha's Nutrition Model

- Odisha, once a high malnutrition state, has shown remarkable progress.
- **NFHS Data:** Stunting reduced from **45% (2005–06)** to **29% (2019–21)**, outperforming national average.
- **Key Interventions:**
  - Early adoption of **MAMATA scheme** (conditional cash transfers for pregnant & lactating women).
  - Provision of **eggs in ICDS and mid-day meals.**
  - Strong **Anganwadi network** with community participation.
  - Active NGO partnerships (e.g., **Gram Vikas** for WASH).
- **Impact:** Decline in child stunting, better maternal nutrition, and reduced anaemia rates.

Way Forward

- **Strengthening Maternal Health & Nutrition:** Focused interventions for **adolescent girls**: iron-folic acid supplements, school-based nutrition programs.
  - Prevent child marriage and early pregnancies through stricter enforcement and awareness.
- **Improving Infant & Child Feeding Practices:** Promote **exclusive breastfeeding** (first 6 months) and **timely complementary feeding**.
  - Reduce unnecessary **C-sections** and ensure **breastfeeding support in hospitals**.
- **Leveraging Technology & Data:** Use **Poshan Tracker App** for real-time monitoring of growth in Anganwadis & Deploy AI for predicting malnutrition hotspots.
- **Ensuring Diet Diversity:** Universal provision of **eggs, pulses, and micronutrient-rich foods** in ICDS/Anganwadi and Mid-Day Meals.
  - Scale-up **biofortification** (iron-rich millet, zinc-rich rice).
- **Tackling Anaemia:** Expand **Anaemia Mukt Bharat** with mass deworming, iron supplementation, and dietary diversification.
- **Education & Women's Empowerment:** Incentivize **girls' secondary education**.
  - Integrate nutrition awareness into **school curriculum** and self-help groups.

- **Water, Sanitation, and Hygiene (WASH):** Strengthen **Jal Jeevan Mission** and **Swachh Bharat Mission** to eliminate open defecation and unsafe drinking water.

India's stunting crisis is not merely about nutrition-it reflects a **syndrome of poverty, gender inequities, sanitation failures, inadequate healthcare, and governance gaps.** A **holistic life-cycle approach** is crucial-starting from **adolescent girls' health → maternal care → early childhood nutrition → sanitation and education.**

Only then can India unlock its full demographic dividend and achieve **SDG-2 (Zero Hunger) and SDG-3 (Good Health and Well-Being).**

Human Trafficking in India

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

Context

Recently two major human trafficking attempts were stopped in West Bengal, underscoring the grim reality that this heinous crime continues to thrive despite ongoing efforts to eradicate it in India.

Human Trafficking cases in India (2018–2022):

- **2018:** 2,278 cases
- **2019:** 2,208
- **2020:** 1,714 (Covid dip)
- **2021:** 2,189
- **2022:** 2,250

Root Causes of Human Trafficking

- **Poverty and Unemployment:** Widespread deprivation and lack of local jobs push vulnerable groups into unsafe migration.
  - **Eg:** Closure of tea gardens in Darjeeling, Kalimpong, and Dooars left many families income-less.
- **Deceptive Recruitment Practices:** Traffickers lure victims with promises of jobs in garment factories, domestic work, gold workshops.
- **Geographical Location & Border Vulnerability: Porous borders with Nepal, Bhutan, and Bangladesh** enable cross-border trafficking.
- **Weak Law Enforcement & Data Concealment:** Many cases go unreported due to **fear, stigma, and police apathy.**
- **Social and Gender Vulnerabilities:** Women, children, and marginalised communities are disproportionately targeted.
- **Disasters and Pandemic Impact: Covid-19** worsened unemployment, making people vulnerable to false job offers, also Natural disasters displace communities, exposing them to traffickers.

Consequences of Human Trafficking

- **Loss of Liberty & Exploitation**: Victims coerced into bonded labour, sex tolls, or hazardous work remain deprived of wages and rights.
- **Health & Psychological Damage**: Long-standing abuse, malnutrition, and trauma lead to severe mental health burdens.
- **Community Disruption**: Families and economies fracture when members are trafficked.
- **Criminal Network Expansion**: Profits from trafficking undermine governance and reinforce organized crime.
- **Erosion of Trust**: Lack of effective data transparency and victim protection weakens faith in institutions.
- **Inter-Generational Cycle**: Children of survivors often relapse into the same web of deprivation.

Government Initiatives

- **Immoral Traffic (Prevention) Act, 1956 (ITPA):** Main anti-trafficking law.
- **Indian Penal Code (Sections 370, 370A):** Criminalises trafficking for exploitation.
- **Ujjawala Scheme (2007):** Prevention, rescue, rehabilitation, reintegration of victims.
- **Swadhar Greh Scheme:** Shelter, food, counselling for women in distress.
- **Anti-Human Trafficking Units (AHTUs):** Special police units for detection and rescue.
- **TrackChild Portal:** Centralised database for tracking missing and trafficked children.
- **Draft Trafficking in Persons (Prevention, Care and Rehabilitation) Bill, 2021:** Comprehensive framework for prevention, rescue, rehabilitation (awaiting passage).

- **International Cooperation:** India is a signatory to **UN Palermo Protocol**.
  - It establishes a common definition of human trafficking, provides a framework for states to prevent and combat it, protect its victims, and promote international cooperation to achieve these goals.

Case Study

Andhra Pradesh – Operation Muskaan

- The State Police launched **Operation Muskaan**, a month-long intensive rescue drive, in collaboration with NGOs and Child Welfare Committees.
- **Key Features:**
  - Raids on factories, hotels, and transit hubs to identify trafficked children.
  - Use of **TrackChild Portal** for identification and reunification.
  - Rehabilitation through **child homes**, counselling, and education.
- **Impact:** Thousands of children rescued in successive drives (2015 onwards). The model was replicated in several other states, and even adopted nationally under **Operation Smile** (Ministry of Home Affairs).

Sweden – The "Nordic Model" against Sex Trafficking (Global)

- In **1999, Sweden criminalised the purchase of sexual services** (buyers penalised, not sex workers).
- **Key Features:**
  - Demand-side reduction-tackling traffickers' business model.
  - Strong victim support: safe houses, healthcare, vocational training.
  - Public awareness campaigns to de-stigmatise victims.
- **Impact:** Sweden witnessed a sharp reduction in trafficking inflows. The **"Nordic Model"** has since been replicated in Norway, Iceland, Canada, and France.

Way Forward: Multi-Pronged Strategy

- **Economic Empowerment:** Launch livelihood programs in agro-processing, handicrafts, tourism for vulnerable districts.
- **Enforce Law & Data Transparency:** Independent audits of crime data; victim-sensitive police training; enforce reporting mandates.
- **Regulate Recruitment & Borders:** License placement agencies; use digital ID tracking and surveillance systems.
- **Community-Based Prevention:** Strengthen SHGs, youth clubs, gram panchayats, and local NGOs for early detection and awareness.
- **Victim Rehabilitation & Reintegration:** Offer safe shelters, counseling, legal aid, vocational training.
  - Provide holistic reintegration to prevent re-trafficking.
- **Leverage Technology & Art:** Deploy AI-enabled alerts, GPS in transit hubs.
  - Expand awareness via public art and gamified education (e.g., Missing Link initiatives).

Malaria Endgame in India – Can Elimination by 2030 be Achieved?

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

Context

India's malaria challenge is no longer about widespread burden - it now lies in tackling hidden carriers, hard-to-reach regions, and a resilient parasite. The 2030 elimination target is more than a deadline; it is a litmus test of how effectively science, governance, and public health can come together to conquer this age-old disease.

Data

- **Global burden (2023):** 294 million malaria infections, ~6,00,000 deaths (WHO).
- **India's progress:** >80% decline in malaria cases between 2015–2023 (NCVBDC).
- **Persistent hotspots:** Tribal districts like Lawngtlai (Mizoram) and Narayanpur (Chhattisgarh) still report **>20 cases per 1,000 population**.
- India aims to **eliminate malaria by 2030,** in line with the WHO target.

Challenges in Malaria Elimination in India

- **Biological and Scientific Challenges:**
  - **Drug Resistance: Plasmodium falciparum** is showing reduced sensitivity to **artemisinin-based combination therapies (ACTs)**.
  - **Insecticide Resistance:** Mosquito vectors are adapting to **insecticide-treated bed nets and spraying chemicals**, weakening existing vector control.

  - **Relapse-Prone Parasite: Plasmodium vivax** can **lie dormant in the liver** and cause relapses months later, making elimination more difficult.
  - **Asymptomatic Carriers:** Many people carry malaria parasites without symptoms, sustaining a **hidden reservoir** of infection.
- **Geographical and Demographic Challenges:**
  - **Hotspot Regions:** Tribal and remote districts of **Chhattisgarh, Jharkhand, Odisha, Mizoram** continue to record high malaria incidence.
  - **Cross-Border Transmission:** Porous borders with Nepal, Bangladesh, and Myanmar allow **imported malaria cases**.
  - **Migration:** Seasonal workers and forest-dwelling populations often fall outside the regular health surveillance system.
- **Health System Challenges:**
  - **Weak Surveillance:** Gaps in early detection, especially for asymptomatic or mixed infections.
  - **Diagnostic Limitations:** Rapid diagnostic tests (RDTs) sometimes fail to detect **P. vivax** or mixed infections.
  - **Manpower Shortages:** Lack of entomologists, trained lab technicians, and frontline staff in high-burden tribal areas.
- **Socio-Economic and Behavioural Challenges:**
  - **Poverty and Housing:** Poor housing, lack of mosquito nets, and unsanitary surroundings create breeding grounds.
  - **Low Awareness:** Misconceptions about malaria transmission and treatment delay healthcare-seeking behaviour.
  - **Health Inequities:** Tribal, rural, and marginalised communities face the highest burden but have the least access to healthcare.
- **Climate and Environmental Challenges:**
  - **Climate Change:** Rising temperatures and irregular rainfall extend mosquito breeding seasons.
  - **Extreme Weather:** Floods and heatwaves create new breeding sites, often overwhelming local health systems.

Key Initiatives for Malaria Elimination in India

- **National Framework for Malaria Elimination (NFME), 2016–2030:** Strategic roadmap targeting elimination by 2030.
- **National Centre for Vector Borne Diseases Control (NCVBDC):** Coordinates data, surveillance, and vector control.
- **Indigenous Vaccine Development**:
  - **AdFalciVax** (ICMR, 2025): India's **first dual-stage vaccine** (infection + transmission blocking).
  - Stable at room temperature, useful in rural deployment.
- **R&D Collaborations:** ICMR, NII, RMRC, and international partners working on **PfSPZ**, **PfRH5**, and **Pvs230D1M**.
- **Transmission-Blocking Vaccines (TBVs):** Target mosquito gut stage to **halt community transmission**.
  - Indian teams are actively contributing.
- **New Platforms: mRNA vaccines**, **protein-ferritin nanoparticles**, **engineered antibodies**, and **gene drive** technologies.

Scientific Innovations

The Vaccine Race

- **First-Generation Vaccines:**
  - **RTS,S (2021):** ~55% efficacy, needs 4 doses.
  - **R21/Matrix-M (2023):** ~77% efficacy, low cost, fewer doses, manufactured in India (Serum Institute).
- **Next-Generation Candidates**
  - **Whole-Parasite Vaccines (PfSPZ, PfSPZ-LARC2):** Mimic natural infection; single-dose potential.
  - **PfRH5 (Blood-stage vaccine):** Offers cross-strain protection by targeting a vital protein.
- **Transmission-Blocking Vaccines (TBVs):** Target parasites in mosquitoes, breaking community transmission.

Interventions Beyond Vaccines

- **Genetic Engineering of Mosquitoes: CRISPR-based gene drives** to reduce mosquito fertility or block parasite development.
  - **Risks:** ecological disruption, resistance evolution.
- **Short-lifespan Mosquitoes:** Engineering infected mosquitoes to die earlier, reducing transmission.
- **Improved Vector Control:** Environmental management, smart surveillance using GIS, drones for larval mapping.

Way Forward

- **Strengthen Surveillance & Health Systems:**
  - Real-time **digital surveillance** at PHC level.
  - Better diagnostics for asymptomatic carriers and mixed infections.
  - Training doctors and ASHAs in malaria detection and relapse management.

- **Invest in Science & Innovation:**
  - Fast-track trials for **AdFalciVax** and **P. vivax**-specific vaccines.
  - Promote **public–private partnerships** with biotech firms.
  - Develop **immune biomarkers** and benchmarks for vaccine success
- **Integrated Vector Control:**
  - Rotate insecticides to counter resistance.
  - Promote **environmental management** (eliminate stagnant water).
  - Use **GIS mapping, drones, and predictive AI** to target hotspots.
- **Socio-Economic Measures:**
  - Focus on **tribal districts** with targeted IEC campaigns.
  - Distribute insecticide-treated nets and ensure **universal access to treatment**.
  - Improve housing and sanitation to reduce mosquito breeding.
- **Climate-Adaptive Strategy:**
  - Include malaria risks in **climate action plans**.
  - Pre-position health teams in **flood/monsoon-affected areas**.
- **Governance & Political Will:**
  - "**COVID-style push**": Strong coordination across ministries, states, and research bodies.
  - Ensure **adequate funding** and accountability milestones.
  - Strengthen **India's role in regional cooperation** (Asia Pacific Malaria Elimination Network).

Malaria elimination is no longer just a health goal - it is a measure of India's **scientific capacity, governance effectiveness, and commitment to SDG 3 (Good Health and Well-being).** The path forward requires an integrated approach - leveraging next-generation vaccines, strengthening surveillance, advancing vector control, and promoting community participation - to ensure that no district is left behind.

Online Real-Money Gaming and the Mental Health Crisis

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

Context

Online real-money gaming in India has sparked debates around **economic opportunities, legality, taxation, and regulation**. While economic and legal aspects are discussed widely, the **mental health impact on children and adolescents** remains underemphasized.

Why Online Gaming is Addictive

- **Psychological Design:** Mimics gambling mechanics - variable rewards, immersive loops, instant gratification.
- **Peer Pressure & Social Validation:** Leaderboards, competitions, and online communities create **FOMO (fear of missing out)**.
- **Behavioural Hooks:** Daily "login bonuses," time-limited rewards, and near-miss outcomes that condition players' brains.
- **24x7 Availability:** Unlike traditional gambling, access is continuous, private, and harder for parents to monitor.
- **Algorithmic Manipulation:** Platforms track user behaviour and push tailored nudges to sustain engagement and spending.

Consequences of Addiction

- **On Children & Adolescents:**
  - **Identity crisis:** Children link self-worth with digital achievements ("winning in games"), altering self-perception.
  - **Behavioural changes:** Secrecy, lying, aggression, stealing money to fund gameplay.
  - Rising cases of **depression, anxiety** → weakening **social cohesion** among peer groups.
  - **Academic underachievement** → affects **social mobility and opportunities** in future.
- **On Families:**
  - **Strained family structures:** Constant arguments, mistrust, secrecy weaken family as a **primary social institution**.
  - **Generational divide:** Parents struggle to monitor digital habits → widening communication gap between generations.
  - **Gender dimension:** Boys more likely to be involved in real-money gaming, girls more in social media → creates **gendered patterns of digital addiction**.
  - **Financial stress:** Sudden debts and drained bank accounts.

- **On Society at Large:**
  - **Erosion of social capital:** Distrust within families spills into wider community.
  - **Hidden inequality:** Poor households hit harder by financial losses from gaming addiction, leading to **greater economic vulnerability and social marginalisation**.
  - **Youth alienation:** Excessive screen time reduces participation in **community, sports, and civic life**, weakening collective bonds.

Arguments for Banning/Regulating	Limitations of a Ban Alone
• **Protect minors**: Shield impressionable children from early addiction. • **Prevent family financial losses**. • **Address public health emergency**. • **Global precedent**: China, South Korea, and Singapore have introduced age restrictions and playtime limits.	• **Psychological displacement**: Addiction may shift to pornography, social media, or substance abuse. • **Underground markets**: Banned platforms may go black-market, increasing risks. • **Loss of revenue and innovation** in gaming industry. • Difficult to enforce bans uniformly across digital platforms.

What is missing in Current Discourse

- **Public Health Dimension:** Online gaming addiction should be recognised as a **mental health disorder**, similar to **WHO's classification of Gaming Disorder (2019)**.
- **Legal Ambiguity:** Supreme Court has repeatedly debated **skill vs. chance** games → A **central regulatory framework** is missing.
- **Economic Considerations:** Online gaming industry projected to touch **$5 billion by 2025**, Bans may discourage investment, but unchecked growth risks massive social costs.
- **Governance & Institutional Response:** Fragmentation between **MeitY (IT regulation), Health Ministry, and State Governments**.
  - Lack of child online safety laws specific to gaming addiction (unlike cyber-bullying laws).
- **Ethical Dimension:** Companies exploit **psychological vulnerabilities of children**, undermining **ethical business practices and societal trust**.

Way Forward

- **Regulation + Safeguards:** Age-gating, playtime limits, and strict parental controls.
  - Transparent disclosure of in-game spending and risks.
  - Ban predatory "loot box" style gambling mechanics.
- **Mental Health Framework:** School-based **digital addiction screening** & Training parents and teachers to detect behavioural warning signs.
- **Awareness & Education:** National campaigns on **safe digital habits** & Workshops for parents on healthy tech supervision.
- **Technology Solutions:** AI-based monitoring of excessive playtime.
  - Panic button/lock features built into apps.
  - Strict KYC norms to prevent minors from bypassing age restrictions.
- **Policy Integration:** Bring gaming addiction under **National Child Policy**.
  - Create a **National Digital Wellness Mission**, similar to POSHAN Abhiyaan.
  - Align with **National Education Policy (NEP 2020)** emphasis on mental health.

Online gaming addiction is not just an individual or legal problem; it is a **societal issue** affecting families, youth, and community life. It reflects deeper themes of **globalization, consumer culture, weakening family bonds, intergenerational conflict, and rising inequality**. India must move beyond bans towards a **multi-sectoral approach** that combines regulation, counselling, community engagement, and digital literacy.

Elderly Women's Health in India - A Silent Crisis

Syllabus Mapping: GS-Paper 2, Vulnerable Sections

Context

According to the **India Ageing Report 2023** (IIPS & UNFPA), people aged **60 years and above will constitute over 20% of the population by 2050**. Women, on average, live **2.7 years longer than men**, Yet, elderly women's health issues remain **neglected, under-studied, and under-served**.

Challenges Faced by Elderly Women

Social & Structural Barriers

- **Patriarchal conditioning** makes women prioritise family needs over their own health.
- Health decisions are often controlled by **spouses or adult children**, reducing women's autonomy.
- **Financial dependence**: Nearly **60% of older women lack personal income**; <20% can pay medical bills (vs 44% men).
- **Digital divide:** Very few elderly women use digital devices, restricting access to tele-health and health information.

Access Gaps in Healthcare

- Limited availability of **female doctors and gender-sensitive facilities.**
- Lack of support in navigating complex hospital procedures.
- Rural elderly women often travel long distances to access even basic health services.

Disease Burden & Neglect

- **Non-communicable diseases (NCDs)** like hypertension, diabetes, and cardiovascular illnesses have more severe outcomes in women post-menopause due to hormonal shifts.
- **Bone health**: Women are disproportionately affected by osteoporosis and arthritis; higher risk of fractures reduces mobility and mental well-being.
- **Cancers**: Cervical and ovarian cancers often go undiagnosed until advanced stages.
- **Neurodegenerative diseases**: Alzheimer's and dementia are more prevalent among women (due to longer lifespan and estrogen decline), but underdiagnosed.
- **Mental health**: Only **1 in 10 elderly women with depression** seek help (HelpAge India) due to stigma and poor access to counselling.

Policy Gaps

- Current policies emphasise maternal and reproductive health but **ignore post-reproductive health needs**.
- **Fragmented governance**: Women's ageing issues are not systematically integrated into national health missions.
- **Lack of gender-sensitive geriatric care:** Absence of specialised programmes for elderly women within the healthcare system.

Implications of Deteriorating Elderly Women's Health in India

- **Social Implications:**
  - **Gendered vulnerability**: Elderly women live longer than men (life expectancy gap ~3 years), but often with poor health due to lifelong malnutrition and neglect.
  - **Dependency**: Ill health increases reliance on family members for care; widows face higher risk of abandonment and neglect.
  - **Intergenerational burden**: Care responsibilities often fall on daughters-in-law, reinforcing gendered caregiving roles.
  - **Social exclusion**: Poor mobility and chronic illnesses restrict participation in community/social life, deepening isolation.
- **Economic Implications:**
  - **Out-of-pocket expenditure**: Women often lack pensions or savings, making healthcare costs catastrophic.
  - **Feminization of poverty**: Poor health reduces ability to engage in household or income-earning activities, reinforcing poverty cycles.
  - **State burden**: Growing demand for geriatric and long-term care increases pressure on public health financing.
- **Demographic & Policy Implications:**
  - **Aging society challenge**: By 2050, elderly will be ~20% of India's population, with women forming the majority.
  - **SDG commitments**: Poor elderly women's health hinders progress on SDG 3 (Good Health and Well-being), SDG 5 (Gender Equality), and SDG 10 (Reducing Inequalities).

Schemes & Initiatives by Government for Elderly women

- **Indira Gandhi National Old Age Pension Scheme (IGNOAPS)**: Minimum pension for elderly (60+), with state top-ups.
- **Pradhan Mantri Vaya Vandana Yojana (PMVVY)**: Pension scheme for senior citizens, helps elderly women with assured returns.
- **National Social Assistance Programme (NSAP)**: Social pension for elderly BPL women.
- **Atal Pension Yojana**: Ensures minimum monthly pension for women in informal sector.
- **Expanded Ayushman Bharat - PMJAY:** Provides free secondary & tertiary care to poor elderly, many of whom are widowed women.
- **Jan Aushadhi Yojana**: Affordable generic medicines for elderly women suffering from chronic illnesses.
- **Rashtriya Vayoshri Yojana (2017)**: Provides free assistive devices (hearing aids, walking sticks, dentures) to BPL elderly, majority beneficiaries are women.

Way Forward

- **Inclusive Health Policies**: Integrate elderly women's health into the **National Health Policy** and geriatric care schemes.
- **Financial Security:** Expand pensions, insurance coverage (Ayushman Bharat), and provide targeted subsidies for elderly women.
- **Gender-Sensitive Healthcare:** Increase training for female doctors and community health workers.
- **Preventive Care & Screening:** Routine NCD screening, osteoporosis check-ups, and awareness campaigns.
  - Early detection of cancers through **pap smears, mammography, and ultrasound**.
- **Digital & Community Interventions:** Bridge the **digital gender gap** through literacy programmes.
  - Use **self-help groups and ASHA workers** for outreach.
- **Mental Health Support:** Expand community-based counselling, social engagement centres, and destigmatise mental health care.

India's elderly women face a **triple burden**: longer lifespans, poorer health in old age, and systemic neglect. To ensure **healthy and dignified ageing**, India must build **gender-sensitive, inclusive health systems**, secure financial and digital access, and promote preventive care.

TOPICS FOR PRELIMS

Denotified, Nomadic and Semi-Nomadic Communities (DNCs)

Context

Community leaders are demanding the **establishment of a permanent National Commission for Denotified, Nomadic, and Semi-Nomadic Tribes (DNTs)**.

About DNTs (Denotified, Nomadic, and Semi-Nomadic Tribes)

- **Denotified Tribes**: Communities that were listed as "criminal tribes" under the British-era Criminal Tribes Acts (1871–1947) and later "de-notified" after the Acts were repealed in 1952.
- **Nomadic Tribes**: Social groups that historically practiced seasonal or periodic migration as a livelihood strategy.
- **Semi-Nomadic Tribes**: Communities that move less frequently and over shorter distances compared to fully nomadic groups.
- **Key characteristics of DNTs include:**
  - Diverse cultures, traditions, and social structures.
  - Historically nomadic livelihoods, providing goods and services to settled communities.
  - Strong ecological connections and dependence on natural resources.
  - Patriarchal social systems.
- **Schemes for development of DNTs:**
  - **Dr. Ambedkar Pre-Matric and Post-Matric Scholarship for DNTs:** To include DNT students not covered under SC/ST/OBC.
  - **Nanaji Deshmukh Scheme of Construction of Hostels for DNTs:** For DNT students (not SC/ST/OBC) pursuing higher education.

Status of DNTs in India

- Over **10 crore Indians** belong to more than **1,400** DNT, Nomadic, or Semi-Nomadic communities.
- These groups are spread across various States and have distinct socio-economic challenges.
- Important commissions were relayed to DNT's:
  - **Renke Commission (2008)**: To identify and list DNT communities.
  - **Idate Commission (2014)**: Tasked with creating a State-wise list and recommending welfare measures. Tenure: 3 years.
- Many DNTs fall under SC, ST, or OBC categories but still face exclusion from mainstream welfare schemes.

Honour Killing

Context

Despite rising inter-caste marriages and increasing Dalit empowerment, cases of caste-based 'honour' killings continue to surge in Tamil Nadu, Telangana, Maharashtra, and Kerala.

What is 'Honour' Killing?

- Murder of a family member, usually a woman, by relatives/community members for allegedly bringing dishonor/shame to the family.
- Rooted in **strict cultural, social, and religious norms** about family honor, morality, and behavior.
- Closely linked to **women's choices** in marriage, relationships, sexuality, and modesty.

Causes

- **Patriarchy**: Women's sexuality and choices are controlled to preserve male "honour."
- **Caste System**: Strong link with endogamy. Khap Panchayats in North India often oppose intercaste/intercommunity marriages.
- **Community Identity**: Individual rights are subordinated to family/community reputation.
- **Social Control Mechanism**: Families and local councils enforce violence to "discipline" and "deter" others.
- **Gender Inequality**: Women are disproportionately victims, showing how "honour" is tied to female behaviour.

Consequences

- Direct attack on the fundamental right to life; reinforces gender inequality.
- Families/communities suffer trauma and long-term psychological damage.
- Restricts women's education/employment; sustains regressive traditions.
- Negative international image for India's human rights record.

Judicial Stand

- **Lata Singh vs State of UP (2006):** SC condemned violence against inter-caste couples; termed honour killings "barbaric."
- **State of UP vs Krishna Master (2010):** SC upheld life imprisonment for honour killing convicts.
- **Arumugam Servai vs State of Tamil Nadu (2011):** Parents may disown but not harass children for inter-caste marriages.
- **Shakti Vahini vs Union of India (2018):** Honour killings = violation of fundamental rights.
  - Directed states to set up **special cells** and provide **protection to threatened couples**.

Pradhan Mantri Matru Vandana Yojana (PMMVY)

Context

The Ministry of Women and Child Development has extended the special registration drive for PMMVY until 15 August 2025.

About Pradhan Mantri Matru Vandana Yojana (PMMVY)

- It was launched in 2017 and in 2022 incorporated in Mission Shakti (umbrella scheme for
- safety, security and empowerment of women).
- It is a conditional cash transfer scheme for Pregnant Women & Lactating Mothers (PW&LM).
- **Objectives**:
  - Provide **partial wage loss compensation** through cash incentives so women can rest before and after childbirth (first child).
  - Promote **health-seeking behaviour** among Pregnant Women & Lactating Mothers.
  - **Special Provision**: Miscarriage or stillbirth cases are treated as **fresh cases** for benefit eligibility.
- **Coverage**: For women from **socially and economically disadvantaged sections**.
  - Applicable for **first two living children**, with the **second child benefit allowed only if it is a girl**.
- **Monetary Benefits:** ₹5,000 provided from early pregnancy till childbirth & Additional ₹1,000 under Janani Suraksha Yojana after institutional delivery.

State Health Regulatory Excellence Index

Context

Recently, the union health secretary launched the State Health Regulatory Excellence Index (SHRESTH).

About SHRESTH Index

- It is a first-of-its-kind national index to benchmark and strengthen state drug regulatory systems.
- **Developed by:** Central Drugs Standard Control Organization (CDSCO).
- **Objective:** Ensure consistent drug safety, quality, and efficacy across India through a transparent, data-driven framework.
- **Key Features:**
  - **Two-tier classification of states** into Manufacturing States and Distribution States/UTs.
  - **Data-driven ranking system** with monthly updates to ensure continuous performance improvement.
  - **WHO-aligned quality standards** to elevate medicines to global benchmark status (ML3-equivalent).
  - **Cross-learning mechanism** through sharing of best practices and success stories from top-performing states.

PAHAL Scheme

Context

The Indian government has deactivated more than 4 crore duplicate or inactive domestic LPG connections under its PAHAL scheme.

About PAHAL Scheme

- Pratyaksh Hanstantrit Labh/Direct Benefits Transfer For LPG (PAHAL) scheme is India's Direct Benefit Transfer (DBT) system for LPG subsidies.
- **Nodal Ministry**: Ministry of Petroleum & Natural Gas.
- **Objective:** Transfers LPG subsidies **directly** to consumers' bank accounts to ensure **transparency**, prevent diversion, and reduce leakages.
- Instead of subsidized cylinders being delivered directly, the consumer pays the full market price for LPG and the government transfers the subsidy amount to the registered bank account.
- It covers over 17 crore LPG consumers nationwide, making it the largest cash transfer program globally.

She Leads-II Programme

Context

Second edition of UN Women's flagship capacity-building programme –SheLeads was inaugurated recently.

About She Leads Programme

- It is a flagship capacity-building programme of **UN Women India Country Office**.
- **Objective:** To strengthen women's **public and political leadership** by providing skills, mentorship, and networks.
- **Key Features:**
  - **Capacity Building:** Training women in electoral campaigning, governance, policy-making, media engagement.

- **Grassroots Focus:** Targets women leaders from Panchayats, local bodies, civil society, and aspiring politicians.

UN Women

- The United Nations Entity for Gender Equality and the Empowerment of Women was established in 2010 (by merging several UN bodies focused on women).
- **Mandate:**
  - Promote **gender equality** globally.
  - Eliminate discrimination against women and girls.
  - Empower women across **political, economic, and social** spheres.
  - Support countries in achieving **SDG 5 (Gender Equality)**.

MERITE Scheme

Context

The Union Cabinet has recently approved the proposal for implementation of the MERITE Scheme.

About MERITE Scheme

- MERITE stands for Multidisciplinary Education and Research Improvement in Technical Education.
- It is a **World Bank-assisted, Central Sector Scheme** to transform technical education in India
- **Objective**: To improve **quality, equity, and governance** in technical education across India, in line with the **National Education Policy (NEP) 2020.**
- **Beneficiaries:** 275 technical institutions comprising 175 engineering institutions and 100 polytechnics.
- **Key Interventions:**
  - **Digitalization Strategies:** Smart classrooms, e-learning platforms etc.
  - **Multidisciplinary Programs:** Guidelines for blending engineering with management, humanities, design, etc.
  - **Curriculum & Skill Development:** Updated, labour market-aligned courses.
  - **Research & Innovation:** Strengthening research hubs and incubation centers.

National Medical Register

Context

The Union Minister of State for Health and Family Welfare has recently clarified that National Medical Register ID registration is voluntary.

About National Medical Register (NMR)

- It is a centralized, digital database of all doctors who are **licensed to practice modern medicine (allopathy) in India**.
- It is maintained by the **National Medical Commission (NMC)**, which replaced the Medical Council of India (MCI) in 2020.
- It is governed by the **National Medical Commission Act, 2019 (Section-31)**
- **Key Features:**
  - **Unified Digital Database:** Consolidates records from State Medical Councils and the NMC into one national-level registry.
  - **Unique Permanent ID (NMC ID):** Every registered doctor gets a Permanent Registration Number.

APAAR ID

Context

The Central Board of Secondary Education (CBSE) has recently made it mandatory for schools to use students' 12-digit APAAR ID during the registration process of Classes 9 and 11.

About APAAR ID

- APAAR stands for Automated Permanent Academic Account Registry (APAAR).
- It is part of the **National Education Policy (NEP) 2020**, introduced to streamline student record-keeping.
- It provides a **'One Nation, One Student ID'** to track students' academic records.
- **Functions**:
  - Stores students' academic achievements.
  - Facilitates easy transition between schools and institutions.
  - Helps in processing and verifying transcripts.
- **How It Works**:
  - Linked to **Aadhaar** and stored in **DigiLocker**.
  - Data collection is done via the **Unified District Information System for Education Plus (UDISE+)** portal, which holds statistics on schools, teachers, and students.

Indian Council of Social Science Research (ICSSR)

Context

ICSSR to issue notice to Centre for the Study of Developing Societies (CSDS) over 'manipulation' of Maharashtra poll data.

About ICSSR

- It is the apex body of the Union Government for research in the social and human sciences.
- Founded in 1969, ICSSR operates under the aegis of the **Union Ministry of Education**.
- **Functions**:
  - Provides **grants and fellowships** (doctoral, post-doc, senior).
  - Funds **research projects and institutes** (29 ICSSR institutes).
  - Organises **training, workshops, research methodology courses**.

- Publishes journals, reports, and maintains research databases.

India's First 100% Digitally Literate State

Context

Recently Kerala achieved distinction of being India's first fully digitally literate state.

What Is "Full Digital Literacy"?

- **Digital literacy** goes beyond merely knowing how to operate a device-it is the ability to:
  - **Access**, **understand**, and **use** digital tools (e.g., paying bills online, booking services, using UPI, navigating e-governance portals),
  - **Gain confidence and independence** in the digital world,
  - Function efficiently in a tech-driven **society and economy**

Positive Impacts of Full Digital Literacy

- **Governance:** Better access to e-governance services, transparency, reduced middlemen.
- **Economy**: Boosts digital jobs, online business, financial inclusion (UPI, DBT).
- **Social Inclusion**: Bridges digital divide; empowers women, rural and marginalized groups.
- **Education**: Wider access to online learning (SWAYAM, DIKSHA), future-ready skills.
- **Healthcare**: Telemedicine, digital health records, awareness campaigns.
- **Agriculture**: Farmers access weather, prices, schemes; direct farm-to-market sales.
- **Civic Participation:** Online grievance redressal, informed citizenry.

SCIENCE & TECHNOLOGY

TOPICS FOR MAINS

Satellite internet

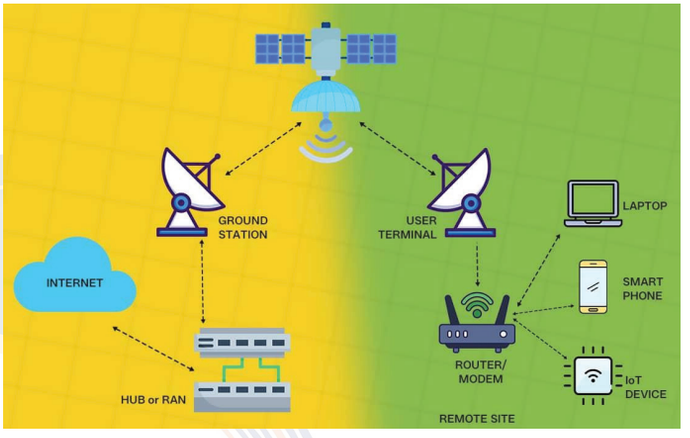
Syllabus Mapping: GS-3: Computers and ICT

Context

In today's increasingly digitised world, internet connectivity is an absolute necessity, across both military and civilian domains. With Elon Musk's Starlink about to make its debut very soon in India, internet infrastructure is going to fundamentally change.

Why Satellite Internet is Needed

- **Ground-based networks (cables, towers) are common but:**
  - Costly and impractical in remote/rural areas
  - Vulnerable to natural disasters
  - Inadequate for mobile or temporary operations
- **Satellite internet:**
  - Offers global, terrain-independent coverage
  - Enables connectivity in disasters, remote areas, and on moving platforms
  - Acts as a transformative, not just backup, technology



Features of Satellite Internet

- New era with LEO mega-constellations (e.g., Starlink)
- Enables military, disaster response, healthcare, agriculture, etc.
- Dual-use (civil & military), creating security and policy complexities
- Real-world examples:
  - Hurricane Harvey (2017) – Satellite internet supported rescue ops
  - Russia-Ukraine war – Starlink critical to Ukraine's defense efforts
  - Siachen Glacier – Used by Indian Army
  - Also misused by insurgents/drug groups in India

Need for Satellite Internet in India

- **Bridge the Digital Divide**: It can provide high-speed internet to India's underserved rural and remote populations, where fiber deployment is economically unfeasible or technically challenging.
- **Support Critical Services**: It enables digital education, telemedicine, and e-governance in isolated regions, improving access to basic services.
- **Disaster Resilience**: Satellite internet remains operational during natural disasters, unlike ground-based networks. It is already being used effectively in crisis zones like Ukraine to support both civilians and military operations.
- **Enable Digital Inclusion**: Connectivity can boost rural entrepreneurship, enable financial inclusion, and integrate millions into the formal digital economy.
- **Fast Deployment**: Compared to laying fiber or building towers, satellite internet can be rolled out swiftly, especially in high-priority zones like borders, tribal areas, or forested regions.

Advantages of Space-Based Internet

- **High Bandwidth:** Capable of supporting high bandwidth usage, ensuring stable internet speed and quality even during peak usage times.
- **Overcoming Obstacles**: Signals from satellites can bypass challenges that hinder fiber-optic cables or wireless networks, such as rugged terrains.
- **Quick Recovery:** Space-based internet can restore connectivity quickly after natural disasters.
- **No Need for Phone Lines:** Unlike traditional connections, satellite internet does not rely on phone lines for operation.

Challenges associated with Satellite Internet

- **Limited Coverage:** It works best in areas with a line of sight to satellites, making it less effective in regions with obstructive terrain.
- **Latency Issues:** Signals must travel long distances between Earth and satellites, resulting in higher latency compared to terrestrial technologies like fiber optic or cable.
  - Thus not useful for real-time applications such as online gaming.
- **Affordability**: The high cost of equipment, such as satellite dishes, can make satellite internet less accessible, especially compared to more affordable broadband options.
- **Impact on Space Observation:** Satellites reflect sunlight to Earth, causing streaks in astronomical images and hindering the work of astronomers.

Ethanol Blending in India

Syllabus Mapping: GS-3: Renewable Energy

Context

India achieved its E20 (20% ethanol-blended petrol) target by early 2025, ahead of schedule under the Ethanol Blended Petrol.

What is Ethanol and How is it Used as Fuel?

- **Definition:** Ethanol is a **renewable, biodegradable alcohol** made from fermenting biomass like sugarcane, corn, or rice.

About Ethanol

- It is a clear, colourless, and flammable liquid, also known as Ethyl Alcohol (**C2H5OH**).
- Ethanol is produced through the fermentation of sugars by yeast or other microorganisms.
- Once blended, ethanol cannot be separated from the petrol.
- As the ethanol molecule contains oxygen, it allows the engine to more completely combust the fuel, resulting in fewer emissions and thereby reducing the occurrence of environmental pollution.
- It has a **higher octane number than gasoline**, hence improving the petrol octane number.

Production of Bioethanol

Bioethanol is mainly produced through two methods:

- **Fermentation Process**: Most common method, it involves fermenting sugars from crops such as corn, maize, wheat, sugar beet, and energy crops like sorghum and Jerusalem artichoke. The sugars from these crops are converted into ethanol by yeast fermentation.
- **Chemical Process**: Ethanol can be produced by reacting ethylene with steam in a chemical reaction.

Use in Fuel: It is mixed with petrol in various proportions: E5, E10, E20, up to E85 or E100. It reduces dependence on fossil fuels and greenhouse gas emissions.

- **Vehicle Compatibility**
  - E10–E15: Safe for most modern engines.
  - E85–E100: Require **flex-fuel vehicles** designed to adjust fuel systems.

India's Ethanol Blending Policy and Goals

- Launched under **National Policy on Biofuels (2018)**.
- Target: **20% blending by 2025-26 (achieved in early 2025)**.
- **Future Targets:** New goal is to have **30% blending by 2030**.

Recent Developments

- Use of **food grains (maize, broken rice)** approved to boost production.
- Exploring **tax incentives** and promoting **E27/E30-compatible vehicles**.
- Slow progress in **2G (second-generation) ethanol**—only one demo plant active.

Government Efforts To Advance Ethanol Blending In India

- **Central Agency Oversight**: The **Department of Food and Public Distribution** oversees the promotion of fuel-grade ethanol distilleries in the nation.
- **Ethanol Blended Petrol Program (EBPP):** Initiated in 2003, this program aims to foster the use of renewable fuels. Originally starting with 5% blending, the goal has been set to achieve 10% blending by 2022, and 20% (E20) by 2025-26, a revision from the earlier target of 2030.

- **National Policy on Biofuels (2018):** This policy sets an indicative target of 5% biodiesel blending in diesel by 2030.
- **Differential Pricing:** To offset the reduced or nullified sugar production, the government has established higher prices for ethanol produced from B-heavy molasses and entire sugarcane syrup.
- **GST Reduction**: The Goods & Service Tax on ethanol intended for the Ethanol Blended Petrol Programme has been lowered from 18% to 5%.
- **Interest Subvention Scheme:** This scheme aims to enhance and augment ethanol production capacity, promoting year-round production.
- **Ethanol Blending Roadmap 2020-25 by Niti Aayog:** It lays out an annual plan to increase domestic ethanol production in line with target of the amended National Policy on Biofuels (2018) as well as with its Ethanol Blended Petrol (EBP) Programme to reach a blending of 20% of ethanol in petrol (E20) by 2025/26.
  - Raise pan-India ethanol production capacity from the current 700 to 1500 crore litres.
  - Phased rollout of E10 fuel by April 2022.
  - Phased rollout of E20 from April 2023, its availability by April 2025.
  - Rollout of E20 material-compliant and E10 engine-tuned vehicles from April 2023.
  - Production of E20-tuned engine vehicles from April 2025.
  - Encourage use of water-sparing crops, such as maize, to produce ethanol.
  - Promote technology for the production of ethanol from non-food feedstock.

Challenges with Ethanol Blending:

- **Vehicle Efficiency Drops: E20 leads to fuel efficiency losses** of 6–7% for four-wheelers, 3–4% for two-wheelers and up to 12% even in newer cars
- **Engine Wear and Tear:** Ethanol is **hygroscopic** (absorbs water), leading to Corrosion of metal parts, damage to rubber and plastic components, clogging of fuel systems and difficult cold starts and rough idling
- **Manufacturer Concerns: SIAM** notes the need for hardware and tuning changes to reduce losses and flex-fuel vehicle adoption is still limited.
- **Consumer Concerns:** Higher ethanol blends mean **paying the same for fewer kilometres**.
- **No Major Tax Incentive Yet:** NITI Aayog proposed incentives, but no policy implemented yet.
- **Fuel Retailers' Challenges:** Need to upgrade **storage and dispensing systems** to handle ethanol.
- **Agricultural Dependence:** Reliance on **food crops** raises concerns about sustainability and food security.

Way Forward

- **Promote Flex-Fuel Vehicle Adoption:** Mandate or incentivize **manufacture and sale of flex-fuel vehicles** that can run on E20–E85.

Retrofit Support for Existing Vehicles: Develop **national guidelines for retrofitting** older two-wheelers and cars for higher ethanol blends.

- **Introduce Blending-Based Fuel Pricing:** Consider **reduced retail prices** for ethanol-blended fuels to reflect lower calorific value.
- **Upgrade Storage and Dispensing Systems:** Provide **financial and technical support** to petrol pumps for ethanol-compatible tanks and dispensers.
- **Fuel Quality Monitoring:** Ensure **strict quality control** and monitoring mechanisms to prevent contamination and maintain ethanol blend accuracy.
- **Expand Feedstock Base:** Promote **second-generation (2G) ethanol** from non-food sources like crop residues and agri-waste.
- **Incentive-Based Policy Reforms:** Offer **tax breaks, lower GST, or viability gap funding** for ethanol producers, especially 2G producers.
- **Regional Production Planning:** Develop **ethanol production clusters** based on local crop availability to reduce logistics and transportation costs.
- **Avoid Food-Fuel Conflict:** Monitor and regulate the **use of food grains** to prevent impact on food security and prices.

FREE AI Committee Report

Syllabus Mapping: GS-3 Computers and ICT

Context

Framework for Responsible and Ethical Enablement of Artificial Intelligence Committee (FREEAI Committee) of Reserve Bank of India (RBI) recently released its report.

About FREE AI Committee

- In **2024**, the **Reserve Bank of India (RBI)** set up an **Internal Committee on Artificial Intelligence** to frame a governance framework for the safe and ethical adoption of AI by **Regulated Entities (REs)** like banks, NBFCs, and insurers.
- The Committee's report in **August 2025** titled: **"Framework for Regulated Entities for Effective AI (FREE AI)"**.
- The aim was to strike a **balance between innovation and risk mitigation**, ensuring that AI adoption enhances efficiency without undermining fairness, accountability, or financial stability.

Significance of AI in Finance

- **Revenue Growth**: AI is expected to be a major growth driver, with financial sector investments projected to touch ₹8 lakh crore by 2027.
- **Efficiency and Personalization**: By automating routine and data-heavy processes, AI enables faster and more accurate operations, such as loan processing and customer support.
- **Boosting Financial Inclusion**: Through the use of alternative data sources like utility payments and GST records, AI helps assess creditworthiness of "thin-file" or first-time borrowers often excluded by traditional systems.
- **Strengthening Digital Infrastructure**: AI enhances India's digital public platforms such as Aadhaar and UPI, enabling more personalized and adaptive financial services.
- **Improved Risk Management**: AI supports fraud detection, early-warning systems, and better decision-making, thereby strengthening overall risk management.
- **Example:** J.P. Morgan's AI-based payment validation reduced fraud and cut account rejection rates by 15–20%.
- **Synergy with Emerging Technologies**: When combined with quantum computing and advanced privacy tools, AI can deliver superior performance, security, and resilience in financial services.

Emerging Risks and Sectoral Challenges of AI in Finance

- **Model Risks:** AI outputs may **deviate from expectations**, leading to losses or reputational harm.
  - Risk sources include:
    - **Data risk** – incomplete, biased, or faulty datasets.
    - **Design risk** – flawed algorithms or misaligned objectives.
    - **Calibration risk** – incorrect parameter weights.
    - **Implementation risk** – poor integration into financial processes.
  - **Model-on-model risk**: AI systems used to supervise other AI models can themselves fail, creating cascading effects.
  - **GenAI risks**: "Hallucinations" (false outputs), lower explainability, and misleading communications to customers.
- **Operational Risks – Systems Under Stress:** Automation reduces human error but **amplifies faults at scale**.
  - **Examples:** AI fraud detection misclassifying genuine transactions → loss of customer trust.
    - Credit scoring models failing due to **data pipeline corruption**.
    - "Model drift" when performance degrades over time without monitoring.
- **Third-Party Risks – Vendor Dependencies:** Financial institutions rely on **external AI vendors and cloud providers**.
  - **Risks:** Service interruptions, software bugs, or security breaches.
    - **Concentration risk** if a few dominant vendors control critical infrastructure.
    - Limited visibility of subcontractors' practices → compliance gaps.
- **Liability and Accountability Risks:** AI systems are **probabilistic, not deterministic**. This blurs lines of responsibility.
- **Risk of AI-Driven Collusion:** Theoretical but significant: autonomous AI systems **colluding to maintain high prices** or manipulate markets.
  - Particularly relevant in **high-frequency trading** or dynamic pricing.
  - Could breach competition laws and distort markets.
- **Financial Stability Concerns:**
  - **Procyclicality**: AI models trained on historical data may amplify boom-bust cycles.
  - **Herding effect**: If multiple institutions use similar AI strategies, synchronized behavior can increase volatility.
    - Example: **2010 Flash Crash**, where automated trading algorithms wiped out nearly **$1 trillion in minutes**.
- **Cybersecurity Risks – A Double-Edged Sword:**
  - **Offensive use**: AI can power advanced cyberattacks like data poisoning, adversarial inputs, deepfake fraud, or phishing.
  - **Defensive use**: AI improves detection through anomaly monitoring, predictive analytics, and real-time response.

- **Data Security and Privacy Risks:**
  - **Over-collection of data**: AI systems often gather more data than necessary, breaching **data minimization principles**.
  - **Data aggregation risks**: Innocent data points, when combined, can reveal sensitive info (mosaic effect).
  - **Cloud dependency conflicts**: Global AI infrastructure may clash with India's **data localization** norms.
- **Consumer and Ethical Concerns: Bias** may exclude vulnerable groups (rural poor, women, minorities).
  - **Opacity** leaves customers unable to understand decisions.
  - **Manipulation risks**: AI-driven nudges may push consumers into choices not aligned with their best interests.
  - Raises ethical issues around **informed consent, exploitation, and fairness**.
- **AI Inertia – Risks of Non-Adoption: Not adopting AI** is itself a risk:
  - Institutions may fall behind in competitiveness and efficiency.
  - Widening financial access gaps if rural/underserved areas miss AI-driven inclusion tools.
  - Without AI, institutions lack the ability to counter **AI-driven cyberattacks**.

RBIS Recommendations

- **7 Sutras for AI adoption:**
  - **Trust is the Foundation:** Trust is non-negotiable and should remain uncompromised.
  - **People First:** AI should augment human decision-making but defer to human judgment and citizen interest.
  - **Innovation over Restraint:** Foster responsible innovation with purpose.
  - **Fairness and Equity:** AI outcomes should be fair and non-discriminatory.
  - **Accountability:** Accountability rests with the entities deploying AI.
  - **Understandable by Design:** Ensure explainability for trust.
  - **Safety, Resilience, and Sustainability:** AI systems should be secure, resilient, and energy efficient.
- **Innovation Enablement**: Build a robust financial sector data infrastructure as part of the digital public infrastructure, linked with AI Kosh.
- **AI Innovation Sandbox**: Set up a secure sandbox (similar to the GenAI Digital Sandbox) where financial institutions can test AI models on anonymized data, with built-in tools to detect bias, errors, and ensure compliance with AML, KYC, and consumer protection standards.
- **Consumer Protection and Security**: Require proportionate AI red-teaming through both regular and event-triggered testing. Introduce incident reporting frameworks with good-faith disclosures to manage risks effectively.
- **Capacity Building in Regulated Entities (REs)**: Design structured training programs for AI governance and risk management across all institutional levels.
- **Knowledge Sharing**: Create mechanisms for exchanging AI use cases and best practices across the financial sector to encourage responsible adoption.
- **AI Incident Reporting**: Develop a dedicated framework for timely detection, reporting, and disclosure of AI-related incidents.

India's battery waste management

Syllabus Mapping: GS-3: S&T- Developments and its Effects

Context

India's rapid EV and renewable growth is creating surging battery waste, making robust, fairly priced recycling and enforcement essential for environmental security and sustainable economic development.

Current Trends in India

- **Rising Demand**: Lithium battery demand is projected to increase from **4 GWh in 2023** to **139 GWh by 2035**.
- **Green Energy Push**: India's **Net Zero target by 2070** and the expansion of **renewable energy** (especially battery energy storage systems or BESS) are key drivers.
- **E-waste Generation**: Lithium batteries accounted for **7,00,000 tonnes** of the **1.6 million metric tonnes** of e-waste generated in 2022.

Challenges Arising from EV Batteries

- **Environmental Risks:** Improper disposal causes **hazardous materials** (like heavy metals and chemicals) to **leak into soil and water**.

  - **Growing volume of battery waste** poses a long-term ecological threat.
- **Inadequate Recycling Infrastructure:** Lack of **robust recycling framework** to manage battery waste sustainably.
  - High recycling costs due to requirements of **advanced technology**, **safe logistics**, and **skilled labour**.
- **Low EPR Floor Price:** Current **Extended Producer Responsibility (EPR)** floor prices are **too low**, making legitimate recycling **financially unsustainable**.
  - Encourages **fraudulent recyclers** who issue fake certificates or dump waste, as seen in India's plastic waste sector.
- **Corporate Non-compliance:** Some **large producers avoid compliance** in developing countries like India, though they follow strict norms in developed nations.
- **Loss of Valuable Resources:** Poor recycling leads to **wastage of valuable minerals** like **lithium, cobalt, and nickel**, increasing India's **import dependency**.
  - Potential **$1 billion foreign exchange loss** by 2030 due to inadequate recycling.

Government Initiatives on Battery Waste

- **Battery Waste Management Rules, 2022 (BWMR):**
  - **Notified by**: Ministry of Environment, Forest and Climate Change (MoEFCC)
  - **Objective**: Ensure **safe, scientific, and sustainable management** of waste batteries, including EV and portable batteries.
  - **Key Features**:
    - Introduced **Extended Producer Responsibility (EPR)** for battery producers.
    - Producers are **mandated to collect and recycle/reuse** used batteries.
    - Promotes the **circular economy** by recovering valuable materials like lithium, cobalt, nickel.
    - Encourages **eco-design and use of recycled materials**.

Way Forward

- **Recalibrate EPR Floor Price:** Set a **fair and globally comparable EPR floor price** that covers– Collection, Safe transport, Advanced recycling methods, Material recovery.
  - Avoid underpricing — e.g., the UK mandates ₹600/kg, India's proposal is less than one-fourth of that.
- **Strengthen Enforcement: Digitise** the tracking of EPR certificates.
  - Introduce **strong audit systems**.
  - Impose **strict penalties** for non-compliance and fraud.
- **Formalise Informal Sector: Train and integrate** informal recyclers into the formal economy.
  - Provide **regulatory and technical support** to improve recycling standards.
- **Foster Industry Dialogue:** Encourage **collaboration between policymakers, recyclers, and industry** to design a viable, sustainable EPR pricing model.
- **Ensure No Consumer Burden:** Highlight that **consumers won't face price hikes** since manufacturers have not passed on the benefits of falling global metal prices.

Conclusion

The rise of EVs in India is inevitable and essential for decarbonisation. But without **sustainable battery waste management**, especially **recycling**, India risks serious **environmental degradation**, **economic loss**, and a **setback to its circular economy goals**. A **revised EPR framework**, **industry accountability**, and **integration of informal sectors** can turn this crisis into an opportunity for **green growth**.

Indian's Digital Welfare

Syllabus Mapping: GS-3 Computers and ICT

Context

India has made huge progress in using digital tools for welfare. Welfare delivery is becoming more technical and data-driven, but less democratic. This push for efficiency may be **reducing citizen participation and weakening accountability**.

How Technology is Changing the Welfare State

- The digital system follows a logic that is:
  - **One-way** (top-down delivery)

- **Streamlined and measurable** (easy to monitor)
- **Less tolerant of errors or complexity**

Key Challenges

- **Technocratic Turn in Welfare Governance:** Over **1 billion Aadhaar enrollments** and **1206 schemes on DBT** reflect India's digital-first welfare model.
  - The focus has shifted from **"who needs help"** to **"how to deliver help efficiently"** — this shift has made welfare less about **rights** and more about **data and algorithms**.
- **Democracy Deficit:** Schemes like **e-SHRAM** and **PM-KISAN** are examples of this.
  - These programs deliver benefits efficiently but ignore people's lived experiences or local needs.
  - Citizens are no longer treated as **rights-bearing individuals** but as **data entries** or **beneficiaries**, who have no say in how the system works as critiqued in **Justice Chandrachud's Aadhaar dissent**.
- **Welfare Spending and Transparency are Declining:** Despite all the talk of a "welfare state," India's **social spending has gone down** — from an average of 21% (2014–2024) to 17% in 2024–25.
  - Important welfare areas like **minorities, labour, nutrition, and employment** have been hit hard. Spending in these areas fell from 11% (before COVID-19) to just 3% now.
  - At the same time, the **Right to Information (RTI)** system is in trouble. As of June 2024, there were over **4 lakh pending cases** and **8 vacant positions** in information commissions.
  - This shows a lack of transparency and weakening citizen oversight.
- **Rise of 'Algorithmic Insulation':** The **Centralised Public Grievance Redress and Monitoring System (CPGRAMS)** tracks complaints well and resolves many cases. But it may be doing so without clear responsibility.
  - While issues are being recorded and closed, it is unclear **who is actually responsible** for fixing them.
  - This creates a situation where technology increases visibility but hides accountability

What Can Be Done?

- **Make Digital Systems More Democratic:** Build systems that don't collapse under stress — embed human discretion, context-sensitivity, and local feedback loops.
  - This is called **democratic antifragility** — a system that improves under stress by learning and adapting.
- **Empower Local Governments:** States and villages must have more freedom to design programs that work for their people. Programs like **Kudumbashree in Kerala** are good examples.
- **Bring Back Citizen Voice:** Empower **Gram Sabhas**, **frontline workers**, and **local feedback** to play a bigger role. Citizens must be able to question decisions and demand better services.
- **Protect Rights in Digital Systems:** There must be clear rules for:
  - **Offline support** when digital systems fail
  - **Bias checks**
  - **Appeal and explanation rights** — so people can challenge wrong decisions
  - The **UN Special Rapporteur on Poverty** has also recommended regular audits involving communities to ensure fairness.

Conclusion: Focus on the Citizen

- Digital tools can help deliver welfare faster and cleaner. But if we forget the **human side of governance**, the system may become efficient but unfair.
- A truly **developed (Viksit) India** must not treat people as just data points. Citizens must be partners in governance — not just passive beneficiaries.
- Let's build a system that is **smart, fair, and democratic** — one that listens to people, not just machines.

Mass Produce of Fraudulent Scientific Research

Syllabus Mapping: GS-3 Issues related to IPR

Context

A new study published in Proceedings of the National Academy of Sciences (PNAS) on **August 4** warns that **scientific fraud is no longer rare or isolated**. It has now become **systematic, organised, and rapidly growing**, threatening the **trust and quality** of research around the world.

Who Are the Fraud Actors?

- The fraud is not just from a few bad individuals. It's an **ecosystem** of:
  - **Paper mills** – companies that write and sell fake research papers
  - **Brokers** – middlemen who help clients get published
  - **Editors and reviewers** – who knowingly accept fake work
  - **Journals** – especially low-quality or hijacked ones, that publish anything for a fee
- Example: **ARDA (Academic Research and Development Association)** in India
  - It grew from 14 to **86+ journals** offering guaranteed publication.
  - Often shifts to new journals when old ones get caught or deindexed.
  - Even sells **authorship** – e.g., a paper on **hazelnut roasting** published in a **journal on HIV/AIDS**.

How Fraud is Spotted

- **Small groups of editors** are handling **many of the problematic papers**
- Some journals had **clusters of fake research**, often using **copied images** or **template-like structures**
- Fields like **RNA biology and cancer research** were especially affected

Disturbing Trends

- The number of fake papers is **doubling every 1.5 years**
- Fraudulent publishing is **growing 10 times faster** than honest science
- Deindexing by databases like **Scopus or Web of Science** is **too slow** to keep up
  - Only ~100 journals are deindexed yearly, while **thousands** publish fake work
- Most fake papers **are never retracted** — only 25% may ever be pulled out
- And only 10% may be published in journals that are eventually deindexed

Why This is Happening

- **Current reward system in science:** Researchers are judged by **how many papers they publish**, **how many times they are cited**, or **what journals they publish in**
  - This pushes many to **"game the system"** by buying fake papers or cutting corners
  - For **young scientists**, cheating is becoming a **"new normal"** because the system rewards output, not honesty.

What's at Risk

- Honest scientists can't compete with mass-produced fake research
- Funding, promotions, and academic success go to **those who cheat**
- Public trust in science may collapse
- Health, environment, and technology decisions based on fake science may have **real-world harm**

What Needs to Be Done

The study calls for **urgent collective action**:

- Stronger and **independent systems** to detect and punish misconduct
- Better **resourcing for journal quality checks**
- Rethink of **incentives** — promote quality over quantity
- Build systems that cannot be easily manipulated by fraud rings

Challenges in India's scientific publication ecosystem

- **Poor Quality of Research Output:** India's CNCI (Category Normalised Citation Impact) value is **0.879** compared to 1.12 for China and 1.25 for the U.S.
- **Low representation in top-tier journals:** Indian researchers publish more in low-impact journals rather than high-impact international journals.
  - Lack of high-quality, innovative research reduces the global impact of Indian publications.
- **Weak Research Ecosystem:** Inadequate collaboration between academia, industry, and government institutions.
  - Lack of competitive research culture and minimal industry funding for applied research.
  - Overemphasis on quantity over quality to meet publication mandates.

- **Limited International Collaboration:** Fewer joint research projects with global institutions compared to China and the U.S.
  - Limited opportunities for Indian researchers to access global funding and infrastructure.
- **Ethical Issues and Fraudulent Practices:** High incidence of plagiarism, paid publications, and publications in predatory journals.
  - The Omics case (Hyderabad-based group fined $50 million) exposed the scale of fraudulent research practices.
  - Clientelism and political interference weaken research integrity and accountability.
- **Low Investment in Research and Development (R&D):** India spends only **0.67% of its GDP** on R&D, which is significantly lower than other leading countries:
  - Israel – 6.30%, South Korea – 4.9%, U.S. – 3.46%, China – 2.4%, etc.
  - Lack of funding limits the availability of resources, infrastructure, and incentives for researchers.
- **Awareness Gaps & Poor IPR Culture:** Despite over 100,000 startups and 110 unicorns, only a small proportion file for IPR protection.

What Needs to Be Done

- **Increase R&D Investment:** Raise R&D spending to at least **2% of GDP** to match global standards.
  - Encourage private sector participation and industry-academia partnerships in research funding.
- **Focus on Quality Over Quantity:** Establish strict peer-review and publication standards to improve the quality of research output.
  - Incentivize researchers for publishing in high-impact journals rather than focusing on the number of publications.
- **Strengthen Research Ecosystem:** Develop research infrastructure and world-class laboratories in universities and institutions.
  - Promote a culture of research excellence through competitive grants and fellowships.
  - Encourage cross-disciplinary research and international collaborations.
- **International Collaboration and Exchange:** Sign more bilateral agreements for joint research with leading research nations.
  - Facilitate researcher exchange programs and access to global research platforms.
- **Address Ethical and Systemic Issues:** Establish a national-level regulatory body to monitor research integrity.
  - Penalize predatory journals and fraudulent practices through strict enforcement.
  - Encourage ethical research practices through training and awareness programs.

TOPICS FOR PRELIMS

Bluebird Satellite

Context

ISRO is planning to launch the **Block 2 BlueBird communication satellite**—developed by **AST SpaceMobile**, a U.S.-based company—**within the next 3 to 4 months**.

About BlueBird Satellite

- **Type**: Advanced American **communications satellite**.
- **Developer**: Created by **AST SpaceMobile**, a U.S.-based company.
- **Unique Feature**:
  - Enables **direct smartphone-to-satellite connectivity**, allowing users to make phone calls and access broadband **without ground-based towers**.
- **Key Technology**:
  - Equipped with a **64-square meter antenna**.
  - Weighs approximately **6,000 kg**.
  - Operates in **Low Earth Orbit (LEO)** for faster and closer communication with mobile devices.
- **Data & Speed Capabilities**:
  - Supports up to **40 MHz bandwidth**.
  - Offers **peak data speeds of up to 120 Mbps**.
- **Service Coverage (Post-launch)**:
  - Aims to deliver **non-continuous cellular broadband**.
  - Target regions include the **United States** and **select global markets**.

Haemophilia & Prophylaxis

Context

Prophylaxis is highlighted as the gold standard treatment for haemophilia.

What is Haemophilia A?

- A hereditary bleeding disorder in which blood does not clot properly.
- Caused by a deficiency of **Factor VIII**, an essential clotting protein.

Cause & Clotting Process

- Normal blood clotting involves a **coagulation cascade** with ~20 clotting factors.
- Missing or malfunctioning factors increase the risk of excessive bleeding.
- In Haemophilia A, the body produces **insufficient Factor VIII**.

Genetic Transmission

- Usually inherited through an altered gene from parents.
- **Males** with the altered gene show symptoms.
- **Females** are often carriers, may have mild or no symptoms, but can still experience bleeding issues.

Symptoms

- Main symptom: **prolonged bleeding**, often noticed after circumcision in infants.

- Bleeding tendency becomes more visible when the child starts crawling or walking.
- Mild cases may go unnoticed until injury or surgery occurs.
- Internal bleeding can happen anywhere in the body.
- Common signs include:
  - Joint bleeding (pain, swelling)
  - Blood in urine or stool
  - Easy bruising
  - Gastrointestinal or urinary tract bleeding
  - Nosebleeds
  - Prolonged bleeding after cuts, surgery, or dental procedures
  - Spontaneous bleeding without injury

Treatment

- Main approach: **Factor VIII replacement therapy**.
- Involves injecting concentrated Factor VIII into the bloodstream.
- Restores the missing protein to help blood clot normally.

Prophylaxis in Haemophilia

- **Prophylaxis** is the regular, preventive infusion of clotting factor concentrates to avoid bleeding episodes before they occur, rather than treating them after they happen (on-demand therapy).

Purpose

- Maintains clotting factor levels above the threshold needed to prevent spontaneous bleeding.
- Aims to protect joints, muscles, and organs from long-term damage.
- Enables patients to lead an active, near-normal lifestyle without constant fear of bleeds.

How It Works?

- Involves scheduled intravenous injections of **Factor VIII** (for Haemophilia A) or **Factor IX** (for Haemophilia B).
- Can also use newer non-factor therapies (e.g., subcutaneous injections) that rebalance clotting.
- Typically done 2–3 times per week for Haemophilia A, less often for Haemophilia B due to longer half-life.

Types of Prophylaxis

- **Primary prophylaxis**: Started before the second joint bleed and before age 3, to prevent joint damage from the beginning.
- **Secondary prophylaxis**: Started after a few bleeds but before chronic joint damage sets in.
- **Tertiary prophylaxis**: Started after joint disease is established, to prevent further damage and improve function.

Advantages over On-demand Therapy

- Prevents **joint and muscle damage** from recurrent bleeds.
- Reduces the number of spontaneous bleeds and hospitalisations.
- Improves **mobility, independence, and participation** in school, work, and social life.
- Maintains long-term joint health and delays or avoids disability.
- Reduces overall healthcare costs in the long run by avoiding complications.

Global vs. Indian Scenario

- In developed nations: ~90% of haemophilia patients are on prophylaxis, with near-normal life expectancy.
- In India: On-demand therapy is still most common due to **low awareness, limited resources, and high costs**. Some states have recently introduced prophylaxis for children.

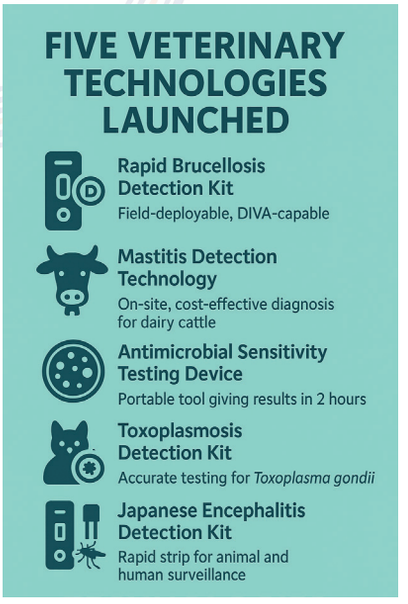
Animal Stem Cell BioBank and Laboratory

Context

A new state-of-the-art **Animal Stem Cell Biobank and Laboratory** was inaugurated at NIAB Hyderabad by Union Minister Dr. Jitendra Singh, alongside the launch of five groundbreaking veterinary diagnostic tools to boost livestock health and support India's "Evergreen Revolution."

Key Points

- **A first-of-its-kind facility**:
  - **Animal Stem Cell Biobank and Laboratory** inaugurated at National Institute of Animal Biotechnology (NIAB), Hyderabad.
  - Cost: ₹1.85 crore; covers 9,300 sq ft.
  - Equipped with stem cell culture units, 3D bioprinter, bacterial culture lab, cryostorage, advanced air handling systems, and uninterrupted power.
- **Supporting infrastructure**:
  - Foundation laid for a new hostel block and Type-IV quarters for research scholars, faculty, and staff at a cost of ₹19.98 crore.



- **Veterinary innovations launched:** To bolster the 'One Health' approach, five diagnostic tools were unveiled:
  - Rapid detection kit for **Brucellosis** (field-deployable, DIVA-capable)

  - **Mastitis Detection** assay (cost-effective, on-site)
  - **Antimicrobial Sensitivity Testing** device (results in 2 hours)
  - **Toxoplasmosis Detection** Kit
  - **Japanese Encephalitis Detection** strip (for mass surveillance)
- **Policy and Vision**:
  - Highlights PM Modi's Biotechnology **BioE3 policy**, positioning India as an early mover in biotech innovation.
  - Facility expansion supported by the **National Biopharma Mission (NBM)** under DBT–BIRAC.
  - Emphasizes veterinary health as pivotal to rural prosperity, livestock productivity, and an "Evergreen Revolution."

About Stem Cells

- **Definition & Potential**
  - Cells with the ability to develop into many different cell types in the body.
  - Under suitable conditions (in the body or lab), they divide to form **daughter cells**.
- **Functions of Daughter Cells**
  - Either remain as stem cells.
  - Or transform (differentiate) into specialized cells like blood cells, brain cells, heart muscle cells, or bone cells.
- **Unique Property**
  - No other cell type in the body can naturally generate new cell types.
- **Role in the Body**
  - Act as a **repair system**, replacing damaged or lost cells.
- **Location in the Body**
  - Found in various tissues such as brain, bone marrow, blood, and blood vessels, among others.

Types of Stem Cells

- **Embryonic Stem Cells**
  - Derived from embryos aged 3–5 days.
  - At this stage, the embryo (blastocyst) contains about 150 cells.
  - **Pluripotent** – can develop into any cell type in the body.
  - Useful for regenerating or repairing damaged tissues and organs due to their versatility.
- **Adult Stem Cells**
  - Present in small quantities in adult tissues (e.g., bone marrow, fat).
  - Have **limited differentiation ability** compared to embryonic stem cells.

GPc

Context

GPc is a new molecule made by scientists at IISc to help spot tumours safely and cheaply.

What is GPc?

- It's built from a zinc–phthalocyanine that works well with near-infrared light.
- Four glucose units are attached so it's water-friendly and easily finds its way to tumours (which love sugar).
- It works with **Photoacoustic Imaging** – a method that uses light and sound, not radiation, to create detailed 3D images of tumours.

Why is it important?

- **No radiation risk** – Unlike Positron Emission Tomography (PET) scans, it's safer for repeated use.
- **Cheaper** – Could be far more affordable than PET or MRI scans, helping patients in low-income areas.
- **Better for certain cancers** – Works especially well for tumours close to the skin, like in the breast or lymph nodes.
- **Possible PET alternative** – Could one day replace PET scans for many patients.

Dengue Virus (DENV)

Context

A new study has identified EDE-like antibodies as a key factor for developing broad, cross-serotype immunity against dengue, offering new hope for effective vaccine development.

What is DENV (Dengue Virus)?

- DENV refers to **Dengue Virus**, which has **four serotypes** (DENV-1, DENV-2, DENV-3, DENV-4).
- It is the most common vector-borne viral disease, transmitted mainly by Aedes mosquitoes.
- Causes a global health burden, especially in Southeast Asia, Africa, and the Americas.

Earlier Vaccination Challenges

- **Primary infection immunity issue:** After the first dengue infection, initial immunity (primary immunity) may **increase risk** of severe disease during a second infection with a different serotype (antibody-dependent enhancement).
- Non-neutralising antibodies can worsen disease by helping the virus enter immune cells.
- Universal vaccine development is hard because immunity must work across **all four serotypes**.
- Past vaccines often only protected against one or two serotypes, leaving risk for severe dengue after subsequent infections.

What are EDE-like Antibodies?

- **EDE** = Envelope Dimer Epitope.
- These antibodies target a specific part of the dengue virus envelope protein, allowing **broad, cross-serotype neutralisation**.
- Found to explain **42%–65%** of virus-neutralising effects and **41%–75%** of E protein-binding effects.

- More prevalent in people with prior exposure to multiple dengue serotypes.
- Strongly correlated with reduced severity of dengue illness.
- Represent a promising target for universal dengue vaccine design.

Orbiting Carbon Observatory

Context

The US government is planning to shut down **NASA's OCO-2 and OCO-3 satellites**, which monitor atmospheric CO_2 and crop health, raising concerns about the loss of crucial climate change data.

About Orbiting Carbon Observatories (OCO)

- **Purpose:** Series of dedicated NASA Earth-observing satellites designed to monitor atmospheric **carbon dioxide (CO_2)** from space and study its role in climate change.
- **First Mission (OCO):** Launched in February 2009 but failed to reach orbit due to a launch vehicle fairing malfunction.

- **OCO-2:**
  - Launched in **July 2014** as a replacement for OCO.
  - Measures atmospheric CO_2 globally and identifies CO_2 sources and sinks.
  - Operates in a **sun-synchronous polar orbit** for consistent daylight measurements.
- **OCO-3:**
  - Installed on the **International Space Station (ISS)** in 2019.
  - Observes CO_2 at different times of day and collects additional plant growth and crop health data.
- **Key Contributions:**
  - Provided the first detailed global maps of CO_2 distribution.
  - Showed that **boreal forests** (northern coniferous forests) absorb more CO_2 than previously thought.
  - Revealed how carbon sinks like forests can turn into carbon sources due to drought or deforestation.
  - Helped improve climate models and CO_2 emission reduction strategies.
  - Supported agricultural monitoring by forecasting crop yields and drought conditions.

HOPE Mission

Context

ISRO organizes Space Analog Mission in Tso Kar Valley, Ladakh

About Indian Human Spaceflight Programme – HOPE Analog Mission

- **Programme Objective**: Led by ISRO's **Human Space Flight Centre (HSFC)**, the Indian Human Spaceflight Programme aims to enable human missions to **Low Earth Orbit** (LEO) and achieve an **Indian Crewed Lunar Landing by 2040**.
- **Purpose of Analog Missions**: To study and address **physiological, psychological, and operational challenges** of human spaceflight by simulating mission-like environments on Earth.

Recent Development:

- On **31st July 2025**, ISRO Chairman **Dr. V. Narayanan** inaugurated the **Himalayan Outpost for Planetary Exploration (HOPE)** in **Tso Kar Valley, Ladakh**.
- The **10-day HOPE analog mission** (1st–10th August 2025) will simulate space mission conditions using a specially designed **Habitat Module (8m)** and **Utility Module (5m)**.
- **Key Collaborators**:
  - **Industry partner** leads mission execution.
  - Academic institutions involved: **IIST, RGCB (Trivandrum), IIT Hyderabad, IIT Bombay, and Institute of Aerospace Medicine (Bangalore)**.
- **Mission Goals**:
  - Study **epigenetic, genomic, physiological, and psychological** responses of two crew members.
  - Validate **health monitoring, planetary operations**, and **microbial analysis protocols**.
- **Strategic Importance**:
  - Data collected will inform the **design of future Indian human exploration protocols and infrastructure**.
  - The mission exemplifies **public-private synergy** in line with PM Modi's vision of opening the space sector to industry.

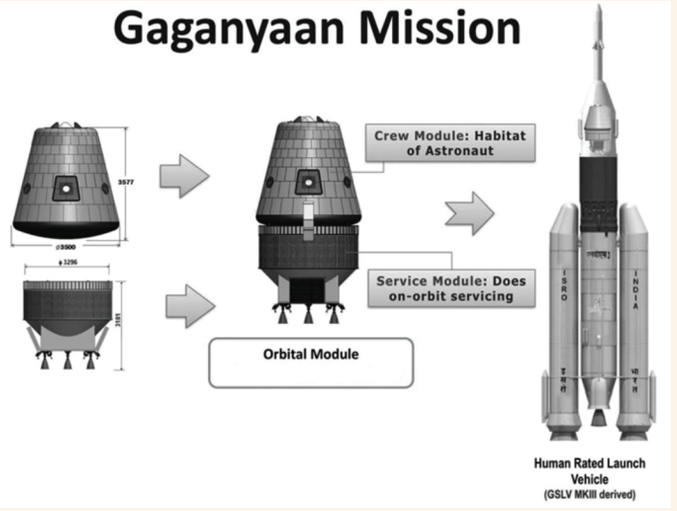
- **Location Relevance**:
  - **Tso Kar Valley is chosen** for its **Mars-like conditions**: high UV radiation, low pressure, cold climate, and saline permafrost.

Human Space flight: Gaganyaan Mission

Gaganyaan is a mission by ISRO to send Indian astronauts to low-earth orbit, onboarded on an Indian launch vehicle. It is a landmark endeavour to attain the objectives of **demonstration of human spaceflight to Low earth orbit (LEO)** and laying the **bedrock of a sustained Indian human space exploration mission.**

Objectives

- **Human Space Flights:** The mission's immediate goal is to showcase India's capability to conduct human space flights.
- **Space Exploration:** Long-term, the mission will lay the groundwork for sustained human space exploration by India.



Technologies Involved

- **Human-Rated LVM3:** The Gaganyaan Mission will utilize a modified version of ISRO's LVM3 (formerly known as GSLV Mk III), which includes a Crew Escape System (CES) and an Orbital Module (OM).
- **Orbital Module (OM):** The OM will carry the crew into orbit.
- **Crew Module (CM):** This is the habitable space for the crew, equipped with control systems, communication, navigation, and avionics. It has a double-walled, rigid structure with a pressurized inner structure and an unpressurized outer one.
- **Service Module (SM):** It supports the Crew Module while in orbit.

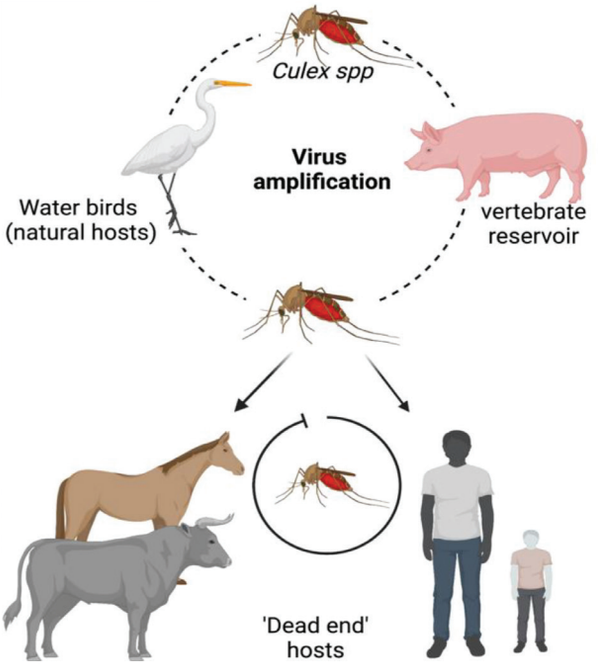
Japanese Encephalitis

Context

Japanese Encephalitis vaccination expanded in Tamil Nadu.

About it

- **What it is:** A **viral disease** caused by the Japanese Encephalitis Virus (JEV), belonging to the Flavivirus genus (same family as dengue and yellow fever).
  - It primarily affects the **central nervous system** and can cause inflammation of the brain (encephalitis).
- **Transmission:** Spread through the bite of infected **Culex mosquitoes** (mainly Culex tritaeniorhynchus).
  - Humans are **accidental hosts**; the main virus cycle occurs between **mosquitoes, pigs, and wading birds**.
- **Geographic Spread:** Found in many parts of **South and Southeast Asia** and the **Western Pacific**.
  - In India, it is **endemic** in states like Uttar Pradesh, Bihar, Assam, Odisha, and Tamil Nadu.
- **Symptoms:** Most infections are **asymptomatic or mild** (fever, headache).
  - Severe cases may cause **high fever, neck stiffness, seizures, coma, and brain inflammation**, with risk of death or permanent neurological damage.
- **Prevention and Control:Vaccination** is the most effective preventive measure.
  - Vector control (reducing mosquito breeding in paddy fields, water bodies).
  - Protecting pigs from mosquito exposure, as they act as amplifying hosts.
  - Public awareness and early diagnosis.



Amoebic Meningoencephalitis

Context

Kerala's health department has issued an alert in Kozhikode district following the detection of three consecutive cases of the rare infection **primary amoebic meningoencephalitis (PAM)** in the region.

Primary Amoebic Meningoencephalitis (PAM)

- **About:** A rare but severe infection affecting the brain and its protective membranes.
  - Mortality rate is extremely high (over 95%).
  - Usually affects young, active individuals.

- **Cause:**
  - Triggered by Naegleria fowleri, popularly called the **"brain-eating amoeba."**
  - Found in warm freshwater and soil.
  - Enters the human body **through the nose**.
- **Types of Amoebic Encephalitis:**
  - **PAM:** Caused by Naegleria fowleri. Rapid onset, often fatal within days.
  - **GAE (Granulomatous Amebic Encephalitis):** Caused by Acanthamoeba species and Balamuthia mandrillaris. Progresses slowly but equally lethal if untreated.
- **Transmission:**
  - Present in shallow surface waters, hot tubs, spas, and poorly maintained swimming pools.
  - Infection occurs when contaminated water enters the nose (during diving, jumping, or swimming).
  - The amoeba travels to the brain via the nasal passages.
- **Symptoms:**
  - Early: sore throat, headache, forehead pain.
  - Later: nausea, vomiting, high fever, hallucinations, confusion.
- **Treatment:**
  - Early detection and rapid administration of specific antibiotics may help.
  - Despite treatment, recovery is very rare.

India's Commissioned its first indigenous green hydrogen plant

Context

Deendayal Port Authority (DPA) commissioned the country's first 'Make in India' one megawatt (MW) green hydrogen plant, at Kandla. This is the first phase of a planned 10MW facility and is the first such development at an Indian port.

About the project

- the entire project was led by Indian engineers.
- The electrolyzer used to produce the hydrogen is made in India.
- It is capable of producing approximately 140 metric tonnes of green hydrogen annually.
- This is the first phase of a planned 10MW facility and is the first such development at an Indian port.

Significance:

- The plant was set up in four months and is fully indigenous. It reflect the speed ,scale and skills.
- It marks a pivotal step in maritime decarbonization, enhancing India's global leadership in sustainable port operations.

About National Green Hydrogen Mission

- Objective: Make India a Global Hub for production, usage and export of Green Hydrogen and its derivatives.
- Target: Production of 5 MMT per annum of Green Hydrogen by 2030.
- Ministry: Ministry of New and Renewable Energy.
- Components:
  - Strategic Interventions for Green Hydrogen Transition (SIGHT) programme: Incentives for manufacturing of electrolysers and production of green hydrogen.
  - Pilot Projects for steel, mobility, shipping, etc.
  - Development of Green Hydrogen Hubs.

An Ancestor of potato was a tomato

- A new scientific study has found that an ancestor of the modern-day potato was a wild tomato species.

Details of the Finding

- A genomic analysis of **450 cultivated potatoes** and **56 wild species** showed that:
  - The **potato lineage originated** from **natural interbreeding** (hybridisation) between:
    - A **wild tomato**
    - A **potato-like species** in **South America**, around **9 million years ago**.
- The **modern-day potato** (Solanum tuberosum) is a result of:
  - A hybrid of two wild ancestors:
    - One **tomato-like species** from Peru (resembled a tomato but lacked a tuber)
    - One **potato-like species** from Bolivia (produced a tuber but was not tomato-like)

Hepatitis D virus labelled cancer

- World Health Organization (WHO) and the International Agency for Research on Cancer (IARC) has formally reclassified the Hepatitis D virus (HDV) as carcinogenic to humans, placing it alongside Hepatitis B and C as known causes of liver cancer.

Hepatitis: A global Concern

- Viral hepatitis (types A,B,C,D and E) are the major causes of acute liver infection.
- According to WHO, Hepatitis B, C, and D together affect over 300 million people globally
- It contribute to around 1.3 million deaths each year, primarily from liver cirrhosis and cancer

Why is hepatitis D considered dangerous?

- HDV can only infect individuals who already carry HBV. HDV essentially hijacks HBV to replicate and cannot cause infection on its own.

- Co-infection or superinfection with HBV dramatically worsens outcomes as HDV raises the risk of liver cancer by two to six times compared with HBV alone
- Up to 75 per cent of chronic HDV patients were likely to develop liver cirrhosis within 15 years
- **Transmission:** The virus spreads through infected blood, unprotected sex, unsafe injections, or occasionally passes from mother to child during birth.

Treatment & Prevention

- **There is no vaccine for Hepatitis C virus.**
- **No vaccine for HDV**, but **HBV vaccination** protects against both.
- **Bulevirtide**, approved in Europe, shows promise when combined with **pegylated interferon**.
- HBV can be managed with **lifelong antivirals**.

Impact on Public Health

- The designation of HDV as Group 1 carcinogen by IARC is expected to mobilise funding, enhance surveillance and improve global awareness about its risks.

Gaps: 2024 Global Hepatitis Report **highlights major gaps as follows:**

- **Diagnosis:** By 2022, only 13 per cent of people with hepatitis B and 36 per cent with hepatitis C were diagnosed,
- **Treatment: Treatment rates** are just **3% (HBV)** and **20% (HCV)** — far below 2025 targets (60% diagnosed, 50% treated).
- Only **80 countries** have integrated hepatitis into **primary healthcare**.

Way Forward:

- scale up HBV vaccination coverage
- ensure universal testing in HBV-positive individuals
- expand access to novel HDV therapies

India's 3rd Launch Pad in Sriharikota

- ISRO targets 2029 to ready the third launch pad for India's next-gen rockets

About the Third Launch pad

- **Progress:**
  - It received financial sanction in March 2025
  - It marks a critical step towards expanding the country's launch infrastructure to support next-generation launch vehicles.
  - ISRO completed geotechnical investigations and topographic surveys of the site by May 2025
- **Significance**
  - Help boost ISRO's Capacity: TLP will support Isro's Next Generation Launch Vehicles (NGLV) and the LVM3 vehicles with semi-cryogenic stages
  - Future endeavour: instrumental for upcoming human spaceflight missions and interplanetary exploration efforts
  - E.g. Bharatiya Antariksh Station planned for 2035 and a crewed lunar landing by 2040.

SHINE Initiative

- CMR and the Department of Health Research (DHR) organised a nationwide open day under the SHINE initiative.

ABOUT ICMR–DHR SHINE Initiative

Purpose & Objective

- Organised by ICMR and Department of Health Research (DHR).
- Part of the SHINE initiative: Science, Health and Innovation for Nextgen Explorers.
- Aimed to spark scientific curiosity and inspire young health researchers.
- Held in response to PM Modi's call for students to "spend one day as a scientist."

Activities Conducted

- Guided lab tours, poster walks, research exhibitions, video screenings, and live demos of scientific projects.
- Students engaged with ICMR scientists to learn about:
  - Their career journeys
  - Research fields and impact on public health

Significance

- Reaffirmed ICMR's commitment to:
  - Nurturing young minds
  - Raising awareness about the role of research in public health

National Deep Water Exploration Mission

- Prime Minister of India announced the National Deep Water Exploration Mission on the 79th Independence Day to boost offshore oil and gas discovery,

What is the Mission?

- A strategic national initiative to explore and discover untapped **oil and natural gas reserves beneath the seabed**, particularly in **deep-water and ultra-deep-water regions**.
- The mission aims to boost **domestic hydrocarbon production** and significantly reduce India's dependence on **energy imports**.
- Deep water, particularly off the Andhra coast and the Andaman Sea, may hold some prospects

Background & Rationale

- India imports nearly **88% of its crude oil and 50% of its natural gas**
- High import costs divert national resources from sectors like poverty alleviation, agriculture, and rural development.
- Past major discoveries (like **Reliance's KG-D6** and **ONGC's KG-DWN-98/2**) occurred before 2014.
- Since 2014, the government has revamped policies, launched the **Open Acreage Licensing Policy (OALP)**, and unlocked new frontiers for exploration.

Recent Developments Supporting the Mission

- **172 oil and gas discoveries** made since 2014, including **66 offshore finds**
- Nearly **1 million sq km** of previously designated **"No-Go" areas** have been opened for exploration
- **25 blocks** offered in the **OALP-X bidding round**, including high-potential ones in the Andaman Basin
- **0.38 million sq km** of exploration acreage awarded—**5x more** than between 2009 and 2014

Why the Andaman Sea Matters

- Considered a **high-potential hydrocarbon zone** due to:
  - Tectonic similarities to Myanmar and North Sumatra (proven petroleum systems)
  - Largely unexplored deepwater regions
- Seen as **India's next oil & gas hotspot**, attracting **global investor interest**

CATCH Grant Program

- **IndiaAI Independent Business Division (IBD)**, in collaboration with the National Cancer Grid (NCG), has announced the launch of the **Cancer AI & Technology Challenge (CATCH) Grant Program**

Objective: Support AI-based innovations for cancer screening, diagnostics, treatment support, and healthcare operations in India.

Funding & Support

- **Grant Amount:**
  - **Up to ₹50 lakh per selected pilot project.**
  - **Additional ₹1 crore scale-up grant for successful pilots.**
- **Funding Partners: Co-funded by IndiaAI and NCG.**

About IndiaAI Mission

- It is a government initiative to promote artificial intelligence (AI) innovation in India.
- **Aim:** To create a robust AI ecosystem in India by democratising access to computing resources, improving data quality and fostering industry partnerships.
- **Focus areas:** Healthcare, education, agriculture, smart cities and infrastructure.
- Implementing Agency: 'IndiaAI' Independent Business Division (IBD) under Digital India Corporation (DIC)
- **Key initiatives:**
  - IndiaAI Application Development Pillar: This initiative promotes AI solutions in critical sectors by developing, scaling and promoting AI applications.
  - IndiaAI FutureSkills: This initiative aims to break down barriers to AI education by offering fellowships to students in top engineering colleges.
- **INDIAai Platform**: This platform serves as a one-stop portal for AI-related development in India. It provides resources such as articles, news, interviews and investment funding news and events. It also offers AI courses, both free and paid.
- Lead agencies for the mission: NITI Aayog, the Department of Science and Technology (DST), the Ministry of Electronics and Information Technology (MeitY) and the Department of Biotechnology (DBT).

India Semiconductor Mission

- Cabinet approves semiconductor manufacturing units in ODISHA, PUNJAB and ANDHRA PRADESH with an outlay of Rs.4600 crore

Key Takeaways

- India's chip market is booming, set to hit $100–110 Bn by 2030.
- India Semiconductor Mission (₹76,000 Cr outlay) boosts local manufacturing, design, and talent.
- On 12th August, 2025, four more semiconductor units were approved; with an outlay of Rs.4600 crore.

- Total approved projects under ISM reaches to 10 with cumulative investments of around Rs.1.60 lakh crore in 6 states.
- India is emerging as a global semiconductor hub with major investments and events like SEMICON India 2025.
- Semicon India 2025 from 300+ global exhibitors and 18 countries, signalling India's rise as a trusted chip partner.

About the India Semiconductor Mission (ISM):

- The **India Semiconductor Mission (ISM)** is a government initiative launched under the **Ministry of Electronics and Information Technology (MeitY)** to build a strong, sustainable semiconductor and display manufacturing ecosystem in India.

Key Objectives:

- Attract global and domestic investment in **semiconductor fabrication**, **ATMP units**, and **design ecosystems**.
- Make India a **global hub** for electronics and semiconductor manufacturing.
- Reduce dependency on imports and enhance **strategic tech self-reliance**.
- Support startups, R&D, and talent development in semiconductor technologies.

Scheme under ISM:

- Semiconductor Fabs Scheme
- **Display Fabs Scheme**
- **Compound Semiconductors and ATMP/OSAT Scheme**
- **Design Linked Incentive (DLI) Scheme**

Nodal Agency:

- **India Semiconductor Mission (ISM)** functions as an independent business division under **Digital India Corporation (DIC**).

ISM plays a central role in vetting proposals, enabling infrastructure, and guiding policy for building India's semiconductor ecosystem.

HISTORY, ART & CULTURE

TOPICS FOR MAINS

Chola empire's legacy of cultural unity

Syllabus Mapping: GS1: Salient aspects of Art Forms, Literature and Architecture

Context

PM Modi's recent visit to Gangaikonda Cholapuram (former Chola capital) along with the inauguration of an exhibition on Rajendra I's northern expedition, has spotlighted the Chola dynasty and Rajendra-I's enduring legacy.

Quotes on Chola empire by PM Modi

- "Legacy of Chola dynasty provides a road map for modern India"
- "Chola-era Kudavolai system is older than UK's Magna Carta"
- "Legacy of Chola empire reflects strength and true potential of our great nation"

Commemorative Coin

- The PM recently released a commemorative coin in honour of Rajendra Chola I, celebrating his contributions to Indian history, architecture, and maritime legacy.

About Cholas

- **Early mention:** The Cholas were one of the longest-ruling dynasties in world history, with references as early as the 3rd century BCE in Ashokan inscriptions.
  - Early mentions also appear in Sangam literature and the Graeco-Roman Periplus of the Erythraean Sea, highlighting their maritime contacts.
- **Re-emerged dynasty:** Under **Vijayalaya Chola (9th century CE)**, power was consolidated in the Thanjavur region.
  - His successors annexed the Pallava and Pandya territories, laying the foundation for imperial expansion.
- **Turning point:** It came with **Rajaraja I (985–1014 CE)**. Born as Arulmozhi varman, he assumed the **title "Rajaraja" or King of Kings**.
  - His military campaigns included victories in Kerala, Sri Lanka, and Kalinga, transforming the Cholas into the paramount Tamil power.
  - **Eg: Copper plate inscriptions and murals in the Brihadeshwara Temple record his achievements.**
- **Expansion**: Rajaraja I's son, **Rajendra Chola I (1014-1044 CE)**, extended the empire further by defeating the Pala ruler Mahipala at Pataliputra, and sending naval expeditions to the Malay Peninsula and Eastern Archipelago.
  - This made the Cholas the first Indian dynasty with overseas territorial ambitions.

Chola Architecture (9th–13th Century CE)

Chola architecture, which flourished between the 9th and 13th centuries in South India, represents the zenith of Dravidian temple design. Centered in Tamil Nadu, it is distinguished by its grand temples, soaring vimanas, and finely detailed stone carvings.

Key Features

- **Boundary Walls**: Massive, high walls enclosed the temple complex.
- **Vimana**: Rising above the garbhagriha (sanctum sanctorum), the vimana was built in a stepped pyramid form, ascending linearly instead of curving. Each temple had only one main vimana.
- **Gopuram**: The temple's front wall featured an imposing gateway tower, often taller than the vimana.
- **Panchayatan Layout:** The complex was arranged in the panchayatan style, with a central shrine surrounded by four subsidiary shrines.
- **Shikhara**: The crowning element of the vimana was octagonal in shape and called the shikhara.
- **Antarala**: A narrow vestibule linked the assembly hall (mandapa) with the sanctum.
- **Mandap**: Pillared halls with flat roofs, adorned with elaborately carved columns. Entrances to the sanctum often displayed sculptures of dvarapalas, mithunas, and yakshas.
- **Water Tank**: A distinctive feature was the presence of a temple tank within the enclosure.

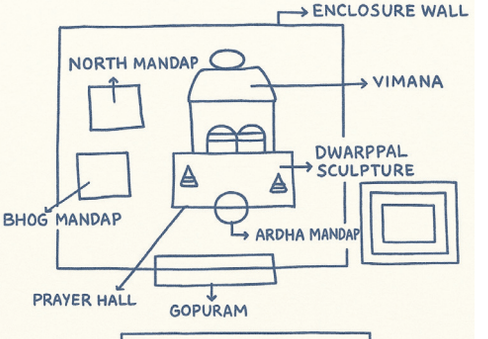


FIGURE: DRAVIDA TEMPLE

Phases of Chola Architecture

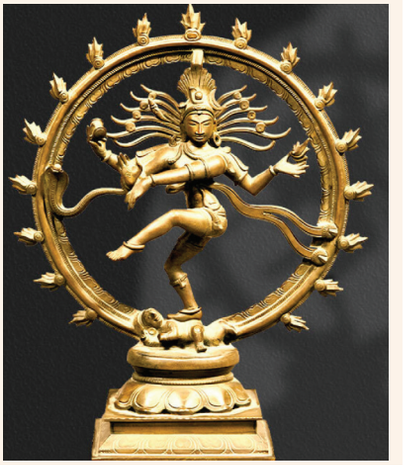
Phase	Period & Rulers	Key Features	Examples / Notes
1st Phase	9th–11th CE (Aditya I & Parantaka I)	• Consolidation of Dravidian art (transition from Pallava rock-cut style) • Dwarapalas (guardian figures) at temple entrances • Sculptures of Chola kings alongside deities • Complexes enclosed by prakara walls with small gopurams • Development of vimana and ardha mandapa	• Queen Sembiyan Mahadevi replaced brick temples with stone structures
2nd Phase	985–1044 CE (Rajaraja I & Rajendra I)	• Introduction of Amman shrines (for female deities) • Construction of thousand-pillared halls • Gopurams built larger and more imposing • Temples reached monumental scale	• Brihadeeswara Temple (Thanjavur, 1010 CE) by Rajaraja I: • Deity: Shiva (Nataraja, Tripurantaka forms) • Tallest vimana in India (60 m) • First use of two massive gopuram gateways • Stucco figures on vimana
3rd Phase	1070–1279 CE (Later Cholas)	• Restoration work and continued temple building • Gopurams became more significant than vimanas • Outer walls decorated with wheels and horses, giving a chariot-like appearance	• Marks a stylistic shift towards ornamentation and grandeur

Contribution of Chola period to Indian heritage and culture

- **Architecture**
  - **Temple Architecture:** The Chola period is renowned for its monumental temple architecture.
    - **Eg: The Brihadeeswarar Temple in Thanjavur, built by Raja Raja Chola I,** is a UNESCO World Heritage Site and a pinnacle of Dravidian architecture.
  - **Sculpture and Iconography:** The Cholas produced exceptional bronze sculptures, particularly of Hindu deities.
    - **Eg: Nataraja statue**, representing Shiva as the cosmic dancer, is an iconic example of Chola artistry.
- **Paintings:** The Chola paintings are an example of great artistic denomination.
  - **Eg: Narthamalai and Tanjore paintings.**
- **Literature and Education:**
  - **Tamil Literature:** The Chola period saw the growth of Tamil literature. The works of **Kamban,** who wrote the Tamil version of the **Ramayana**, and the devotional hymns of the **Nayanars and Alvars,** enriched Tamil culture and literature.
  - **Educational Institutions:** The Cholas patronized educational institutions like the **Thanjavur Saraswati Mahal Library,** which became centres of learning and manuscript preservation.
- **Music and Dance:** The Cholas patronized music and dance, evident in the inscriptions and sculptures at their temples.
  - **Eg: Thanjavur Brihadeshwara Temple** has numerous depictions of musicians and dancers.

Key Features of the Nataraja Sculpture

- **Upper Right Hand:** Holds a damru (drum), symbolizing creation and the rhythm of the cosmos.
- **Upper Left Hand:** Carries fire, representing destruction and transformation.
- **Lower Right Hand:** Displays the abhaya mudra, conveying protection, assurance, and fearlessness.
- **Lower Left Hand:** Points towards the raised foot, a gesture symbolizing liberation and salvation.
- **Apasmara (Dwarf Demon)**: Shiva dances upon the dwarf, signifying the triumph over ignorance.
- **Flowing Locks**: Represent the descent of the Ganges river from Shiva's hair.
- **Earrings**: One male and one female earring denote the concept of Ardhanarishvara, or the union of masculine and feminine energies.
- **Snake on Arm**: Symbolizes kundalini energy and spiritual awakening.
- **Halo of Fire (Prabhamandala)**: Encircling Shiva, it represents the eternal cycle of creation, preservation, and dissolution.



Significance and legacy of ancient Indian architecture in contemporary times

Ancient Indian architecture continues to shape modern society through its cultural, artistic, spiritual, environmental, and economic impact.

- **Global Recognition:** The **Hoysala Temples of Karnataka, inscribed as a UNESCO World Heritage Site in 2023,** exemplify India's mastery in temple design and sculptural artistry.
- **Cultural Revival:** Projects like the **Mahakaleshwar Corridor in Ujjain (2023)** employ traditional temple aesthetics, boosting religious tourism while safeguarding heritage.
- **Sustainable Design:** Elements such as **stepwells (Rani ki Vav) and jaali screens (Hawa Mahal)** are being adapted in modern green buildings for natural cooling and water management.
- **Modern Inspiration:** The **Hampi Art Labs (2024)** blend ancient materials like granite and teak with contemporary forms, bridging traditional craftsmanship and modern creativity.
- **Spiritual Continuity**: Temples such as **Kashi Vishwanath and Jagannath Puri** remain living centers of worship, sustaining India's religious and cultural ethos.
- **Education & Technology:** Initiatives like **Virtual Reality recreations at Hampi (Indian Digital Heritage Project)** engage youth by merging heritage with immersive digital learning.
- **National Identity in Urban Design:** The **Central Vista Project in Delhi** integrates Indian motifs into modern governance spaces, symbolizing a fusion of tradition with contemporary aspirations.

Conclusion

Therefore, the artistic achievements of the Chola dynasty not only defined the cultural zeniths of its times but also laid a timeless, influential blueprint that continues to inspire and inform the artistic heritage of future generations giving uniqueness and diversity to Indian culture.

Women Revolutionaries of Bengal in India's freedom struggle

Syllabus Mapping: GS1: Freedom struggle and important contributors

Context

On **15th August 2025**, India marked its **79th Independence Day**, offering an occasion to revisit the freedom struggle and acknowledge those whose sacrifices remain under-recognized. The contributions of Bengali women revolutionaries throws light on their twin battle against colonial oppression and entrenched patriarchy.

Quotes

- "Women participated in large numbers in nationalist movements, breaking traditional social taboos and demonstrating political courage and commitment" - Bipin Chandra
- "While often seen as secondary participants, women in fact shaped the ideological and moral contours of the freedom struggle" - Mridula Mukherjee

Contribution of women revolutionaries of Bengal in India's freedom struggle

- **Dual front battle:** Early 20th century Bengal discouraged women education, enforced purdah, early marriages and marginalization of widows. This created strong gendered barriers for women not only fighting against British rule, but also rejecting narrow societal roles.
  - **Eg: Pritilata Waddedar from Bethune college,** not only engaged in activism but personally led armed resistance despite social skepticism.
- **Armed revolutionaries:** Highlighted that women were not peripheral supporters but integral architects of the revolutionary strategy.
  - **Kalpana Datta:** Actively participated in the Chittagong Armoury Raid (under Surya Sen). She documented how women served as equal tacticians and partners in the revolutionary movement.
  - **Bina Das:** At the age of 21, she attempted to assassinate Governor Stanley Jackson during Calcutta university convocation in 1932. It exemplified a deliberate and strategic act of protest rather than an impulsive gesture.
- **Social stewardship:**
  - **Begum Rokeya Sakhawat Hossain**: Pioneer feminist, wrote **Sultana's Dream** (1905) envisioning a feminist utopia. Founded Sakhawat Memorial Girls' School and campaigned for Muslim women's education via door-to-door engagement.

  - **Kamala Das Gupta**: Operated within the Jugantar network. Smuggled arms hidden in food baskets, sheltered fugitives, coordinated logistics. Later published **Rakter Akshare** documenting women-led underground networks.
  - **Nanibala Devi**: Widowed Brahmin who disguised herself repeatedly (as wife, servant, mother) to support revolutionary activities. Arrested, tortured in Peshawar camp, yet maintained silence to protect comrades.
- **Symbol of grassroot mobilization:**
  - **Matangini Hazra ("Gandhi Buri")**: An illiterate widow from Tamluk who led a Quit India procession in 1942, chanting "Vande Mataram" as she was shot, symbolising people-powered, inclusive resistance across class lines.
  - **Bhabini Mahato**: From Purulia, supported the Quit India movement by feeding clandestine fighters in jungle hideouts, collecting funds, and later participating in the Bengali Language Movement while highlighting regional contributions beyond Kolkata.

Major contributions of other women in the freedom struggle

Role	Examples
Women led revolts	Rani Laxmibai, Jhalkari Bai and Begum Hazrat Mahal
Advocate for legal reforms	Pandita Ramabai and Rukhmabai supported the Age of Consent Bill
Women participants in movements	Sarla devi chaudhurani in the Swadeshi movement
Home rule movement	Annie Besant
Supporter of Gandhian satyagraha	Kasturba Gandhi
Dharsana Satyagraha	Sarojini Naidu
Hoisted Indian national flat at Gowalia Tank Maidan, Bombay	Aruna Asaf Ali
Ran the underground radio service	Usha Mehta
Political leaders	Sarojini Naidu and Sucheta Kriplani

Implications of Women's participation in the freedom struggle

- **Redefined historical narratives**: Challenged the **male-centric portrayal** of India's independence movement.
  - Established that women were not passive supporters but **leaders, strategists, and martyrs** shaping the course of resistance.
- **Empowerment**: Literacy and education emerged as **acts of defiance** against colonial and patriarchal restrictions.
  - Women's education disrupted social orthodoxies and created **long-term capacity for reform and empowerment**
- **Women in armed resistance:** Participation in **direct militant action** shattered the notion that armed struggle was an exclusively male domain.
  - **Martyrdom and valorous acts** of women revolutionaries inspired future generations to challenge authority and embrace sacrifice
- **Underground networks and covert operations:** Women played a pivotal role in **secret logistical networks**—smuggling arms, sheltering fugitives, and coordinating missions
  - Traditional domestic roles and household spaces were **strategically repurposed** to subvert colonial surveillance and power.
- **Social and cultural transformation:** Women's resistance simultaneously challenged **patriarchy, caste hierarchies, and entrenched social norms**.
  - Their stories foster an **inclusive vision of nationalism**, underscoring that freedom and agency must extend to **all social strata**.

Conclusion

The Bengali women revolutionaries make us rethink the contours of India's freedom struggle, not as a predominantly elite, male narrative, but a multi-class, multi-method insurgency led by courageous women across rural and urban Bengal. Their stories are not just historic anecdotes but they inform contemporary debates on gender equality, grassroots mobilization, and participative democracy.

Quit India Movement

Syllabus Mapping: GS1: Freedom struggle and important contributions

Context

PM Modi paid tribute to Quit India Movement heroes, recalling their role under Mahatma Gandhi's leadership in uniting Indians for independence.

Introduction

The Quit India Movement, initiated by Mahatma Gandhi on 8 August 1942, called for the immediate end of British rule in India. It emerged as a decisive, mass-based civil disobedience campaign during World War II. In response, the British resorted to severe repression, arresting prominent leaders and forcefully curbing the protest.

Background of the Quit India Movement

- **Failure of the Cripps Mission (March 1942):**
  - The Mission proposed Dominion Status after the war, but not immediate independence.
  - Congress rejected it due to the absence of assurances regarding a Constituent Assembly and the immediate transfer of power.
  - Gandhiji famously described the offer as a "**post-dated cheque on a crashing bank**."
- **Impact of World War II:**
  - Britain's global position weakened under Axis power dominance and resource strain.
  - India was involved in the WWII effort without being consulted.
  - Economic distress grew due to inflation, unemployment, and the Bengal famine, fueling resentment.
- **Rising nationalist sentiment:** Growing frustration with the continuation of British rule.
- **Loss of faith in British promises:** Repeated disappointments, such as the 1919 Montagu-Chelmsford reforms and the 1935 Government of India Act, deepened distrust of British intentions.

Difference between Quit India Movement and Earlier Movements

- **Demand for complete Independence**: Unlike earlier struggles focused on reforms or dominion status, the Quit India Movement called for the immediate withdrawal of the British.
- **Spontaneous mass uprising**: Despite the absence of a detailed plan, the movement sparked widespread and spontaneous revolts across the country.
- **"Do or Die" call:** Gandhiji's direct appeal urged people to sacrifice everything, even their lives for freedom, marking a shift from earlier approaches of patient, non-violent resistance.
- **Absence of central leadership:** With the entire Congress Working Committee (CWC) arrested within hours, the movement became leaderless but continued to spread at the grassroots.
- **Broader social participation**: Students, peasants, workers, and women joined actively, while Subhas Chandra Bose's INA also gained momentum.
- **Use of violence and sabotage:** In contrast to previous non-violent movements, this phase saw attacks on railway stations, telegraph lines, and police posts, earning it the name "**August Revolution**."
- **Emergence of parallel governments**: Local self-rule experiments were set up, such as **Chittu Pandey's administration in Ballia.**

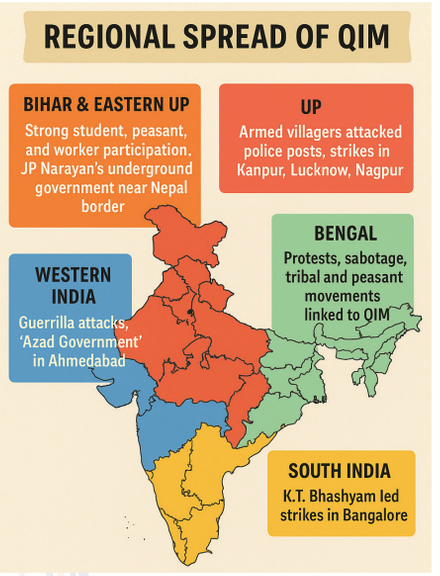
Parallel governments during QIM

Region & Period	Leader(s)	Works Done
Ballia (August 1942)	Chittu Pandey	Released many imprisoned Congress leaders
Tamluk (1942–1944)	Satish Chandra Samanta	• Jatiya Sarkar carried out cyclone relief work • Distributed paddy from the rich to the poor • Organised Vidyut Vahinis (volunteer corps) • Formed Bhagini Sena Sibir (Sisters' Army Camp) with trained women volunteers

Region & Period	Leader(s)	Works Done
Satara (1943–1946)	Y.B. Chavan, Nana Patil & others	• Known as Patri/Prati Sarkar • Formed Toofani Sena, a militia of peasant youth protecting villagers from moneylenders and injustice • Established village libraries and Nyayadan Mandals (justice forums) • Promoted Gandhi marriages (simple, reformist weddings)
Talcher (Odisha)	Local leadership	Established a parallel government challenging British authority

Impact of the QIM

- **Nationwide unrest**
  - Violent protests erupted across India, with Bihar, Maharashtra, and Bengal as major centers.
  - The British responded with severe repression, including the use of aerial bombings.
- **Rise of underground leadership:** Leaders such as Jayaprakash Narayan and Usha Mehta organized secret radios and sabotage networks igniting a united front against a common enemy.
- **Recognition of inevitable power transfer**
  - The colonial administration barely withstood the agitation, reflecting loss of legitimacy.
  - British PM Churchill's cabinet acknowledged that granting independence to India after WWII was unavoidable.
- **Foundation for post-war negotiations**
  - Though suppressed, the movement strengthened India's claim to self-rule.
  - By 1946, the Cabinet Mission arrived with specific proposals for transfer of power.
- **Revival of nationalist sentiment:** Despite failing in its immediate objective, it re-energized mass participation in the freedom struggle.
- **Boost to INA and Bose's legacy:** Parallel to Quit India, Subhas Chandra Bose's INA campaigns gained traction, winning wide public sympathy after WWII.



Failure of the QIM

- **Absence of widespread unity:** Major groups like the Muslim League, Hindu Mahasabha, Communist Party of India, and the Princely States withheld support.
- **Harsh government repression:** Over one lakh people were arrested.
- **Inadequate organizational planning:** Top leaders including Gandhiji, Jawaharlal Nehru, Sardar Patel, and Azad were imprisoned in Aga Khan Palace soon after the resolution.
- The immediate goal of securing independence was not accomplished.
- Parallel governments that emerged during the struggle were short-lived.

Conclusion

According to Bipan Chandra, "the Quit India Movement represented the most formidable challenge to British rule since the Revolt of 1857".

100th anniversary to the Kakori train action and phase of revolutionary activities

Syllabus Mapping: GS1: Freedom struggle and important contributions

Context

The Uttar Pradesh government has organized a series of year-long centenary events to commemorate 100 years of Kakori train action.

About Kakori Train Action

- On **9 August 1925**, revolutionaries of the **Hindustan Republican Association (HRA)** conducted a daring robbery of the British government treasury aboard the Number 8 Down Train near Kakori, Uttar Pradesh.

- The objective was to seize funds for purchasing arms and advancing revolutionary activities, while symbolically protesting colonial economic oppression.
- **Key Personalities Involved:** Ram Prasad Bismil, Ashfaqullah Khan, Chandrashekhar Azad, Manmathnath Gupta, Rajendra Lahiri.
- In the aftermath, several revolutionaries like **Ram Prasad Bismil, Ashfaqullah Khan, Thakur Roshan Singh, and Rajendra Nath Lahiri were executed**, while others were imprisoned or exiled.

About Hindustan Republic Association (HRA)

- **Formation:** In 1924 (Kanpur).
- **Leaders Associated:** Ram Prasad Bismil, Ashfaqulla Khan, Sachindra Nath Bakshi, Sachindranath Sanyal, and Jogesh Chandra Chatterjee.

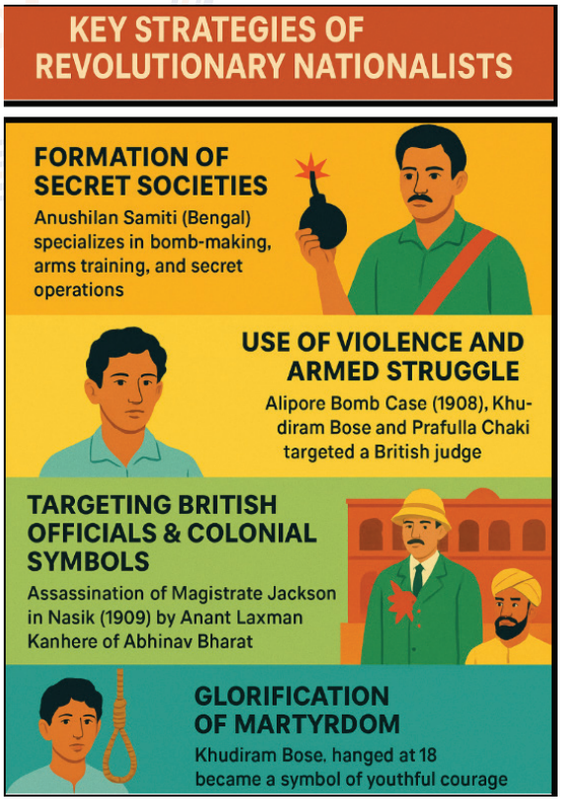
About Hindustan Socialist Republic Association (HSRA)

- **Formation:** At Feroz Shah Kotla, Delhi in 1928.
- **Leader Associated:** Bhagat Singh, Sukhdev, Shiv Verma, Chandra Shekhar Azad and Vijay Kumar Sinha.
- **Aim:** To establish a socialist republic.

1st Phase of Revolutionary Nationalism in India (1907-1917)

Factors behind the rise of revolutionary nationalism

- **Disillusionment with Moderate Politics:** Early Congress leaders relied on petitions and debates, but their failure to secure reforms frustrated the younger generation.
  - **Eg: After the 1905 Partition of Bengal,** moderates' negotiations failed, prompting youth to abandon peaceful methods.
- **Partition of Bengal (1905):** Curzon's partition was perceived as a "divide and rule" strategy, triggering mass protests and radicalisation.
  - **Eg: Groups like Anushilan Samiti and revolutionaries such as Khudiram Bose adopted militant tactics.**
- **Growth of Assertive Nationalism**: Leaders like Bal Gangadhar Tilak, Bipin Chandra Pal, and Lala Lajpat Rai (Lal-Bal-Pal) advocated self-reliance and bold political action.
  - **Eg: Tilak's slogan "Swaraj is my birthright, and I shall have it"** inspired young radicals.
- **Cultural Revival and Historical Pride:** Nationalist leaders revived pride in India's past and celebrated historical figures like Shivaji to instil patriotic zeal.
  - **Eg: Tilak's Ganapati and Shivaji festivals** created unity and militancy in Maharashtra.
- **Repressive Colonial Policies:** Harsh laws, censorship, and arrests intensified resentment against British rule.
  - **Eg: Tilak's arrest under the Sedition Act (1908)** drove many youth towards extremism.
- **Economic Exploitation and Poverty**: Exploitative taxation, famines, and economic distress under colonial rule created fertile ground for radical movements.
  - **Eg: World War I further aggravated poverty and discontent.**



Successes of revolutionary phase 1

- **Psychological impact**: Shattered the myth of British invincibility, instilling courage and defiance among Indians.
  - **Eg: Khudiram Bose's fearless execution at just 18 inspired youth across the nation.**
- **National awakening**: Generated patriotic fervor and heightened political consciousness, particularly among students and youth.
  - **Eg: Journals like Yugantar and Bande Mataram** popularized revolutionary ideals.
- **International support & recognition:** Established global links and secured support from Indian diaspora and sympathetic foreign powers.
  - **Eg: The Ghadar Movement and Indo-German Conspiracy** planned a coordinated global uprising.
- **Contribution to armed struggle**: Laid the foundation for organized military resistance against British rule.
  - **Eg: Rash Behari Bose's efforts helped pave the way for the INA.**

- **Shaping future leaders:** Produced ideologically committed leaders who inspired later movements.
  - **Eg: V.D. Savarkar, Bhagat Singh, and Subhas Chandra Bose** emerged from revolutionary backgrounds.

Limitations of revolutionary phase 1

- **Limited mass support:** Operated largely in secrecy, failing to mobilize broad sections of society.
  - **Eg: Anushilan Samiti and Jugantar** remained confined to urban youth circles.
- **Regional & fragmented nature**: Activities were scattered and largely limited to Bengal, Maharashtra, and Punjab.
  - **Eg: Ghadar Movement's** uprising failed to achieve nationwide coordination.
- **Inadequate planning & resources**: Poor organization, lack of funds, and amateur bomb-making often led to failure.
  - **Eg: The 1908 Muzaffarpur bomb attack** missed its target, resulting in arrests.
- **Lack of ideological clarity**: Overemphasis on violent methods with no clear political or economic blueprint.
  - **Eg: Early groups like Mitra Mela and Abhinav Bharat** lacked a cohesive national vision.
- **Failure to achieve immediate goals**: Despite sacrifices, they couldn't overthrow British rule or trigger a mass revolt.
  - **Eg: The German Plot during WWI** collapsed due to poor execution and intelligence leaks.

2nd Phase of Revolutionary Nationalism in India (1920-1930s)

Influence of Global Events

- **Russian revolution (1917):** Provided a successful example of overthrowing imperial autocracy.
  - **Eg: Deeply inspired Bhagat Singh and other leftist revolutionaries.**
- **End of World War I (1919):** Disappointment over unfulfilled promises of self-governance fueled radicalization.
- **Irish freedom struggle:** IRA's guerrilla tactics influenced revolutionary operations in India.
  - **Eg: Reflected in the Chittagong Armoury Raid.**
- **Rise of International Communism**: Revolutionaries like M.N. Roy collaborated with the Comintern and Soviet leaders, promoting global anti-imperialist solidarity.
- **Chinese Revolution (1920s):** Success of peasant-led movements in China encouraged Indian youth to embrace socialist and mass-oriented revolutionary strategies.

Beliefs and Ideas

- **Armed Struggle as a Necessity**: Violence was considered essential to counter British repression.
  - **Eg: HSRA's bombing of the Central Legislative Assembly in 1929.**

- **Rejection of Constitutional Reforms**: Reforms such as the Government of India Act (1919) were viewed as deceptive measures to pacify demands.
- **Commitment to Socialist Ideals**: Advocated for the elimination of class-based exploitation and equitable wealth distribution.
  - **Eg: Bhagat Singh's writings strongly reflected Marxist influence.**
- **Internationalist Perspective**: Revolutionaries aligned themselves with worldwide anti-imperialist movements for broader solidarity.
- **Youth Mobilization**: Believed students and young activists were the vanguard of revolution.
  - **Eg: Naujawan Bharat Sabha** actively promoted political awareness among youth.
- **Cultural Assertion**: Revived indigenous pride to challenge British cultural dominance.
  - **Eg: Legacy of leaders like Bal Gangadhar Tilak** was invoked to inspire resistance.

Successes of revolutionary phase II

- **Raised political consciousness:** Popularized the idea of Purna Swaraj (Complete Independence), later adopted by Congress in 1929.
- **Creation of iconic martyrs:** Produced enduring symbols of resistance.
  - **Eg: Bhagat Singh's martyrdom turned him into a national hero.**
- **Youth inspiration:** Motivated students and young Indians to join the freedom struggle.
  - **Eg: Chandra Shekhar Azad's death in Alfred Park symbolized youthful defiance.**
- **Link to later movements:** Laid ideological groundwork for leftist groups and the INA in the 1940s.
- **Effective courtroom advocacy**: Used trials as platforms to broadcast revolutionary ideas.
  - **Eg: Bhagat Singh's courtroom statements on revolution became legendary.**

Limitations of revolutionary phase II

- **Severe British repression**: Harsh laws like the Bengal Regulation Act III, along with executions and imprisonment, crushed many movements.
- **Limited mass support**: Could not match the widespread appeal of Gandhi's mass movements, especially in rural India.
- **Internal disunity and betrayals**: Poor coordination and informants led to failed operations.
  - **Eg: Kakori conspiracy leaders were betrayed.**
- **Absence of a clear political program:** Focused largely on armed resistance without a concrete vision for governance or social reforms post-independence.
- **Lack of organized leadership**: Scattered groups operated independently without central coordination.

Conclusion

The second phase of Revolutionary Nationalism represented a bold transition from sporadic violence to a more ideologically driven, globally inspired, and youth-led struggle. Though it failed to overthrow British rule, it profoundly shaped India's political imagination, inspired future leaders, and added a militant edge to the freedom movement.

TOPICS FOR PRELIMS

Dhirio - Bull Fighting

Context

Legislators across party lines in the Goa State Assembly have demanded the legalization of Dhirio.

About Dhirio

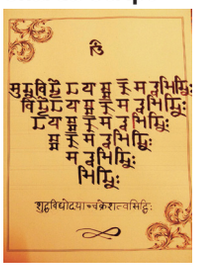
- It is a traditional form of bullfighting popular in Goa.
- Unlike Spanish bullfighting, in Dhirio two bulls fight each other, and no human fights the animal.
- It is traditionally associated with post-harvest celebrations and local church feasts.
- **Legal Ban:** The Goa bench of the **Bombay High Court banned Dhirio in 1997**, citing violations of the **Prevention of Cruelty to Animals Act, 1960.**

Key Supreme Court Judgments

- **Animal Welfare Board of India v.A. Nagaraja (2014):** Supreme Court banned Jallikattu and similar events, holding them as violations of the Prevention of Cruelty to Animals Act, 1960.
- **Constitution Bench Judgment (2023):** SC upheld Tamil Nadu's law allowing Jallikattu, holding that the State can protect such cultural practices subject to reasonable regulation.

News in Short

Sharda Script



News: The inaugural exhibition on Sharda script took place recently at the **Chinar Book Festival in Srinagar**

About Sharda Script

- Shāradā script is a writing system based on the Brahmic family of scripts.
- Historically, it was employed for writing **Sanskrit**, **Kashmiri**, and other languages across the northwestern Indian subcontinent, including regions that are now parts of **Punjab, Himachal Pradesh, Central Asia**, and Kashmir.
- Though widespread between the 8th and 12th centuries, over time, Sharda was gradually supplanted by scripts like **Persian**.

Daruma Doll

News: PM Narendra Modi was presented a Daruma doll during his recent visit to Japan.

About it

- It is a traditional Japanese doll **modeled after Bodhidharma**, an Indian monk who founded **Zen Buddhism in Japan.**
- It represents perseverance, resilience, and good luck; often associated with achieving goals.
- The name 'Daruma' is derived from the Sanskrit word 'Dharma,' meaning cosmic law or duty, which reflects its spiritual roots.

Vrindavani Vastra

News: The British Museum has agreed to transfer the 16th-century Vrindavani Vastra to Assam in 2027 for an 18-month public exhibition.

About it

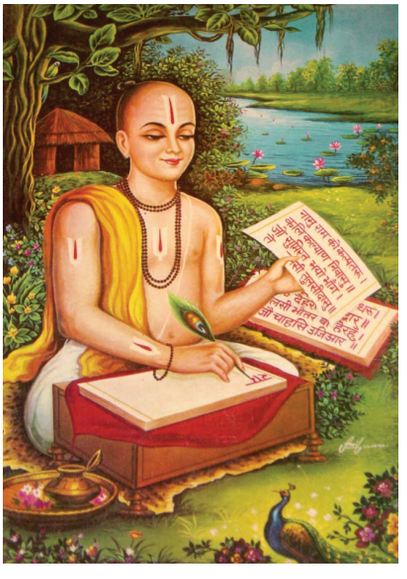
- It is a 16th-century textile created under the guidance of **Srimanta Sankardeva, a saint-reformer from Assam,** at the request of Koch king Nara Narayan.
- It depicts scenes from the life of Lord Krishna, especially his Vrindavan episodes.
- Woven using the traditional Satra institution looms and techniques.

PERSONALITY IN NEWS

Goswami Tulsidas

Context

Recently the 500th birth anniversary of Goswami Tulsidas was celebrated in Chitrakoot (Uttar Pradesh).



About Tulsidas (1532-1623 CE)

- A 16th-century Hindu poet-saint, philosopher, and devotee of Lord Rama.
- His real name was Rambola Dubey. He was a **contemporary of Akbar.**
- **Major Contributions:**
  - He wrote **Ramcharit Manas in Awadhi, a retelling of Valmiki's Ramayana in Awadhi language.**
  - He was a Central figure of the **Bhakti Movement** in North India & Popularized **Rama Bhakti (devotion to Lord Rama)** through vernacular poetry.
  - **Other Literary Contributions:** Dohavali, Sahitya ratna or Ratna Ramayan, Gitavali , Krishna Gitavali or Krishnavali, Vinaya Patrika, etc.

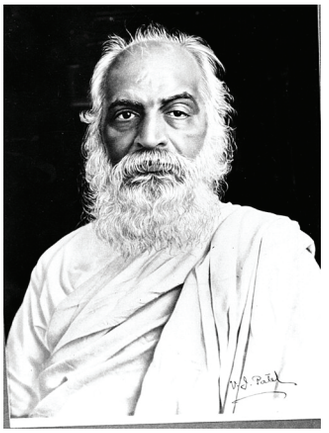
Vitthal Bhai Patel

Context

To commemorate the centenary of Vithalbhai Patel's election as the first Indian Speaker in 1925, the Delhi Legislative Assembly hosted the two-day All-India Speakers' Conference.

About Vitthal Bhai Patel (1873–1933)

- He was an Indian legislator and political leader and **elder brother of Sardar Vallabhbhai Patel.**
- He was born in Nadiad, Gujarat in September 1873.
- He was elected to the Imperial Legislative Council in 1918.
- He also served as the Mayor of Bombay Municipal Corporation from 1923 till 1925.



- **Political Contributions:**
  - Co-founded the **Swaraj Party** with Chittaranjan Das and Motilal Nehru when Gandhi withdrew the Non-Cooperation Movement in 1922.
  - In **1925**, he became the **first elected Indian Speaker (President) of the Central Legislative Assembly.**
  - He established an **independent Assembly Secretariat**, ensuring it reported solely to the Speaker and not to the colonial executive.
  - He also introduced the **"ward and watch" system for legislative security.**

Shri Guru Teg Bahadur

Context

Indian Railways has started an initiative to commemorate the 350th Martyrdom day of Guru Tegh Bahadur Ji. This initiative aims to spread awareness among the younger generation about the teachings and sacrifices of the revered Sikh Guru.

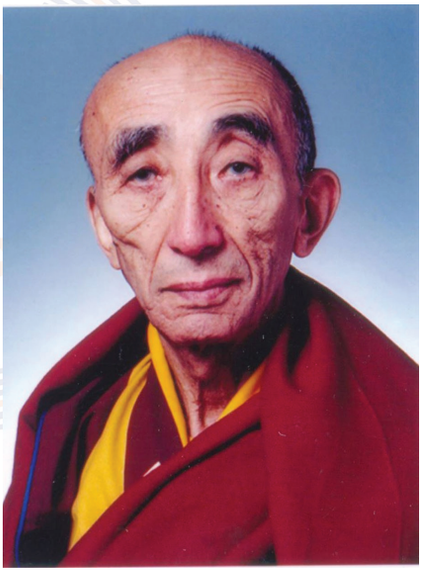
About Guru Tegh Bahadur ji (1621 - 1675)

- He was the **Ninth Sikh Guru,** youngest son of **Guru Hargobind** (the 6th Guru).
- He was **born in Amritsar in 1621** and is known for his spiritual depth, humility, and defense of religious freedom.
- His hymns (116 in total) are included in the **Guru Granth Sahib**.
- His martyrdom is remembered as a supreme sacrifice for **religious liberty and human rights**.
- **Key Contributions:**
  - He founded the town of **Chak Nanki in Punjab, later enlarged into the city of Shri Anandpur Sahib.**
  - He was crowned with the rare honour of **'Hind Di Chadar'.**

Kushok Bakula Rinpoche

Context

A documentary on Kushok Bakula Rinpoche was recently premiered at the India International Centre (IIC), New Delhi.



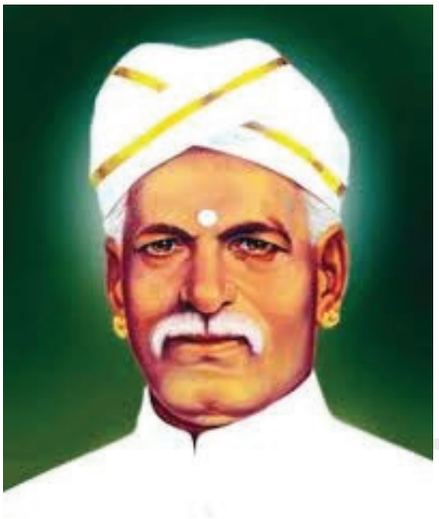
About Kushok Bakula Rinpoche

- He was a revered **Buddhist monk, statesman, and diplomat** from Ladakh, considered an **incarnation of Arhat Bakula** (one of Buddha's 16 disciples).
- He served as the **spiritual head of Pethup Gompa, Spituk (Ladakh)**.
- He also served as **India's Ambassador to Mongolia (1990–2000/2001)**, where he **revived Buddhism** after decades of suppression under communism.
- He is credited with building monasteries, promoting **India–Mongolia friendship**, and spreading Buddhism to Russia and Central Asia.

Mahatma Ayyankali

Context

Mahatma Ayyankali's 157th birth anniversary was celebrated recently.



About Mahatma Ayyankal (1863–1941)

- Born in 1863 in Kerala, in the **Pulayar community** (considered a "lower caste" under the caste hierarchy).
- He faced severe caste-based discrimination and untouchability.
- He is remembered as a **pioneer of Dalit empowerment, education rights, and labor rights** in India.
- He became a member of the **Travancore Legislative Council (1912)**.
- Mahatma Ayyankali founded the **Sadhu Jana Paripalana Sangham (SJPS)** in 1907, to mobilize Dalits for social justice.
- Mahatma Gandhi called Ayyankali as '**Pulaya king'.**
- **Social Reform Efforts:**
  - **Education for Dalits**: Led the **walk to school movement (1907)**, where he defied caste restrictions by sending a Pulayar girl to a government school.
  - **Agrarian Struggles**: Launched the **first agricultural labour strike in 1907**, demanding better wages and dignity.
  - Advocated temple entry rights for oppressed communities.

Raja Prithu Rai

Context

The Assam Cabinet has decided that a new flyover being constructed in the heart of Guwahati would be named after King Prithu.

About Raja Prithu Rae

- King Prithu (also called Prithu Rai or Prithu Singh) was a **13th-century ruler of Kamrup (Assam region)**.
- He belonged to the **Khen dynasty** which ruled parts of present-day Assam.
  - Khen rulers emerged as local chieftains after the fall of the Pala Dynasty.
- He came into prominence during the **invasion of Bakhtiyar Khilji**, the Turko-Afghan general of the Delhi Sultanate.
- **Battle with Bakhtiyar Khilji**:
  - Around **1205–1206 CE**, Bakhtiyar Khilji launched a campaign to capture Tibet through Assam.
  - He faced fierce resistance from King Prithu's forces in Kamrup.
  - Khilji's army was weakened by local attacks, disease, and unfamiliar terrain.
  - Bakhtiyar Khilji was ultimately **defeated and retreated**, dying soon after.