ARK Reflections IAS

ONE-PAGER CURRENT AFFAIRS AUGUST-2025

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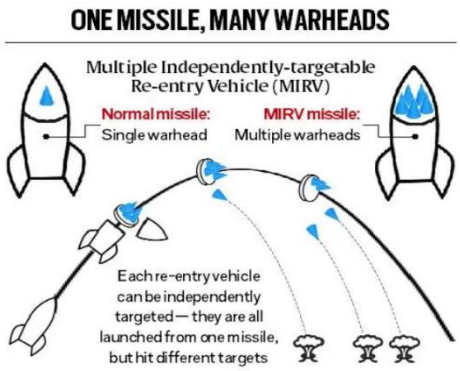
Defence & Technology (GS-3)

1. Russia's Oreshnik Hypersonic Missile

Features

- **Type and Speed**: A hypersonic intermediate-range ballistic missile (IRBM) traveling at Mach 10 (12,348 km/h), making interception difficult.
- **Range**: 3,400–5,500 km, enabling strikes on most of Europe or the U.S. west coast.
- **Fuel**: Solid-fueled for quick, reliable launches without liquid propellant needs.
- **Mobility**: Truck-mounted (12x12 mobile launcher), highly maneuverable and deployable from various locations.
- **Warhead Capability**: Can carry conventional or nuclear payloads, with MIRV (multiple independently targetable reentry vehicles) for multiple targets.
- **Deployment Status**: Inducted into Russian Army; planned for Belarus by late 2025, with Putin threatening use against NATO if long-range aid to Ukraine continues.



- **Strategic Threat**: Described as unstoppable by Western defenses; potentially a modified RS-26 Rubezh missile, enhancing Russia's leverage in the Ukraine war.

2. INS Satpura

Recent News

INS Satpura recently reached Singapore on July 30, 2025, for the 32nd Singapore-India Maritime Bilateral Exercise (SIMBEX-25). This joint training with the Singapore Navy includes talks, ship visits, and sea exercises like air defense, helicopter ops, targeting drills, and search operations. It boosts teamwork, security, and ties between the two navies, supporting India's "Act East" policy.

What is INS Satpura?

INS Satpura is a modern, stealthy warship in the Indian Navy, designed for multiple combat roles like fighting aircraft, ships, and submarines.

- It's part of the Shivalik-class frigates, built in India to show the country's defense manufacturing skills.
- Named after the Satpura mountains in central India.

Why It's Special

- **Stealth Design**: Hard to spot on radar.
- **Versatile**: Handles various threats and missions.
- **Anti Air, Anti Surface, Anti Submarine**
- **Made in India**: Highlights self-reliance in defense.

What is Project 17?

Project 17 refers to the Indian Navy's program to build the Shivalik-class multi-role stealth frigates, the first indigenously designed and constructed warships of this type in India. Launched in the early 2000s, it aimed to enhance naval capabilities with advanced stealth features, integrated weapons systems, and improved survivability. Three ships were built under this project: INS Shivalik (first), INS Satpura (second), and INS Sahyadri (third). These frigates incorporate foreign and domestic technologies, marking a significant step in India's self-reliance in defense manufacturing.

What is Project 17A

Project 17A, also known as Project 17 Alpha or the Nilgiri-class frigates, is the follow-on program to Project 17, developing seven advanced stealth guided-missile frigates with enhanced features over the Shivalik-class. Approved in 2015, it focuses on greater stealth, modular construction, vertical launch systems (VLS) for missiles, and state-of-the-art sensors and weapons. The ships are being built by Mazagon Dock Shipbuilders Ltd (four) and Garden Reach Shipbuilders & Engineers (three), with deliveries ongoing—e.g., INS Himgiri delivered in late July 2025. Project 17A supports India's "Make in India" initiative, addressing modern maritime threats in the Indo-Pacific region.

Indian Navy Warships

1. Aircraft Carriers (2)

- **Role**: Flagship vessels for air power projection with aircraft operations.
- **Names**:
  - **INS Vikramaditya** (Modified Kiev-class, Russia-origin, commissioned 2013)

- **INS Vikrant** (Indigenous, commissioned 2022)

- **Project**: Vikrant is under Indigenous Aircraft Carrier (IAC-1) project; Vikramaditya is a refitted acquisition.
- **Status**: Both active, verified as operational.

2. Destroyers (11)

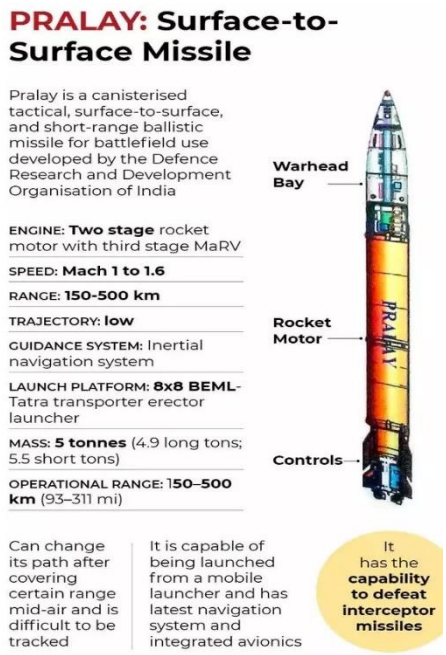
- **Role**: Fast, multi-role warships for escort, anti-air, anti-submarine, and strike missions with advanced missiles and sensors.

3. Frigates (13)

- **Role**: Versatile warships for escort, patrol, anti-submarine, and anti-air warfare, smaller than destroyers.
- **Classes and Names**:
  - **Nilgiri-class (Project 17A, 2 ships active, indigenous)**:
    - INS Nilgiri (commissioned 2024)
    - INS Taragiri (commissioned early 2025)

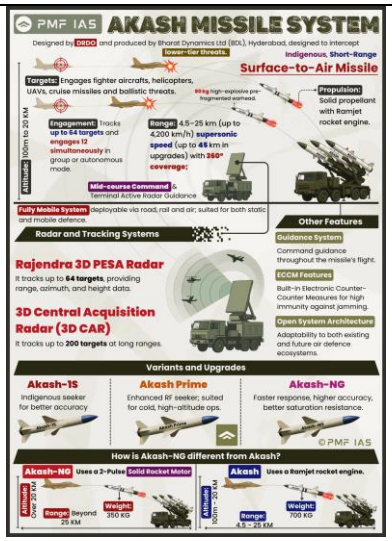
3. Features of Pralay Missile

- **Type**: Solid-propellant quasi-ballistic missile (short-range, maneuverable during flight).
- **Range**: 150-500 km (validated in user trials on July 28-29, 2025).
- **Speed/Precision**: High precision with advanced guidance/navigation; can carry multiple warheads (conventional) against various targets.
- **Development**: Indigenously by DRDO (Research Centre Imarat, Hyderabad; ARDE, HEMRL, R&DE in Pune); first test December 2021.
- **Role/Induction**: Tactical weapon for Indian Army artillery, countering threats with quick strikes.



4. Features of Akash Prime Missile

- **Type**: Upgraded Akash surface-to-air missile for high-altitude regions.
- **Range/Altitude**: 27-30 km range, up to 18 km altitude; improved accuracy with indigenous RF seeker.
- **Speed/Precision**: Hits high-speed aerial targets with pinpoint precision; reliable in low temperatures above 4,500m.
- **Development**: DRDO under IGMDP (late 1980s); maiden test September 2021, production trials July 2025 in Ladakh.
- **Role/Induction**: Air defense for vital areas; engages multiple targets in group/autonomous mode with ECCM features.



Ballistic Missile Classification

- **By Range** (UN Office of Disarmament Affairs):
  - **Tactical Ballistic Missile (TBM)**: <300 km (e.g., short-range tactical strikes).
  - **Short-Range Ballistic Missile (SRBM)**: 300-1,000 km (e.g., Prithvi series).
  - **Medium-Range Ballistic Missile (MRBM)**: 1,000-3,500 km (e.g., Agni-I/II).
  - **Intermediate-Range Ballistic Missile (IRBM)**: 3,500-5,500 km (e.g., Agni-III).
  - **Intercontinental Ballistic Missile (ICBM)**: >5,500 km (e.g., Agni-V).
- **Quasi-Ballistic**: Like Pralay; low trajectory with mid-flight maneuvers, harder to intercept than standard ballistic.
- **Vs. Cruise Missiles**: Ballistic follow parabolic path (powered initially, then gravity-driven); cruise are jet-powered, low-altitude, highly maneuverable (e.g., BrahMos).

Integrated Guided Missile Development Programme (IGMDP)

- **Launch**: Started in 1983 by DRDO to develop indigenous missiles; concluded in 2008.
- **Purpose**: Build self-reliance in missile technology for tactical, short-range, and medium-range systems.
- **Missiles Developed**:
  - **Prithvi**: Short-range ballistic (150-350 km, surface-to-surface).
  - **Agni**: Medium/intermediate-range ballistic (700-5,000+ km, nuclear-capable).
  - **Akash**: Medium-range surface-to-air (upgraded to Akash Prime).
  - **Trishul**: Short-range surface-to-air (discontinued).
  - **Nag**: Anti-tank guided missile.
- **Legacy**: Led to advanced variants (e.g., Akash Prime, Agni Prime); paved way for programs like Pralay (post-IGMDP).

5. Indigenous Air Defence System & Mission Sudarshan Chakra

What is Mission Sudarshan Chakra?

- Announced by the Prime Minister in August 2025, Mission Sudarshan Chakra is India's flagship national security initiative to develop a homegrown, multi-layered, networked air defence shield by 2035.
- It aims to protect India's borders, infrastructure, and citizens from multi-domain threats: missiles, aircraft, drones, and cyber attacks.
- The name draws inspiration from Lord Krishna's legendary Sudarshan Chakra, reflecting both cultural ethos and cutting-edge Indian defence innovation.

Key Features

- **Integrated Air Defence Weapon System (IADWS):**
  - Successfully tested by DRDO in August 2025.
  - Comprises only indigenous systems:
    - Quick Reaction Surface-to-Air Missiles (QRSAM)
    - Advanced Very Short Range Air Defence System (VSHORADS) missiles
    - High-power laser-based Directed Energy Weapon (DEW)
- **Multi-Layered Protection:**
  - Offers several layers of defence by integrating surveillance (ground, space, cyber), missile batteries, radars, and advanced AI-driven response.

Broader Vision & Significance

- **Self-Reliance:** Entirely researched, developed, and produced in India, reflecting Aatmanirbharta (self-reliance) in defence.
- **Offensive Capabilities:** System not only defends but can also facilitate precision counterstrikes if required.
- **National Coverage:** Envisages security for military and civilian installations, including high-value and strategic assets, critical infrastructure, and vulnerable urban centres.
- **AI and Future-Tech:** Will incorporate artificial intelligence, cybersecurity, sensor fusion, and rapid response for next-generation warfare needs.

Why Needed?

- Growing threats from long-range missiles, drones, and cyber warfare; increasing danger to military and civilian targets.
- Lessons from recent hostilities (like Operation Sindoor) underlined the need for a robust, integrated, and indigenous shield.
- India seeks to match advanced systems like Israel's Iron Dome or US missile shields, tailored to Indian operational scenarios.

SCIENCE & TECHNOLOGY (GS-3)

6. AI-designed proteins to generate immune cells

A team of Harvard scientists, led by Rubul Mout from Assam and including Nobel laureate David Baker and Harvard Medical School Dean George Daley**, has developed AI-designed soluble proteins to activate the Notch signaling pathway, enabling large-scale generation of T cells for enhanced immunity against cancer and viral infections, as detailed in a recent study published in Cell.**

These synthetic Notch agonists overcome limitations of traditional lab methods by working in vivo and in bioreactors, using AI-driven protein design technologies that contributed to Baker's 2024 Nobel Prize in Chemistry. The approach supports T cell development from immune progenitors, boosts vaccine responses in mice by increasing memory T cells, and holds promise for immunotherapy, vaccine development, and immune regeneration.

- **Notch Signaling Importance**: A critical cell-to-cell pathway for differentiation, T cell production, and tissue homeostasis; activation is vital for immune defense but previously lacked effective soluble activators.
- **AI-Driven Innovation**: Employed computational protein design to create a library of custom soluble agonists, tested for Notch activation and T cell support, addressing therapeutic gaps.
- **Overcoming Prior Methods**: Earlier immobilization of ligands on dishes was unsuitable for human use; new agonists enable scalable, in vivo applications.
- **Experimental Demonstrations**: Produced T cells in bioreactors for CAR-T therapies; enhanced mouse vaccination outcomes with more T cells and long-term memory cells.
- **Broader Applications**: Advances clinical T cell production, immunotherapy, and related fields like tooth regeneration via similar agonists

7. Why India needs as a national space law

Paper: GS- III **subject**: science and technology Topic: Space technology
Context: India is set to celebrate its second **National Space Day** on 23 August, highlighting ambitious initiatives such as follow-ups to **Chandrayaan-3** and the **Gaganyaan mission**. However, the country still does not have a comprehensive **national space law** to regulate and promote private and commercial activities in outer space.

National Space Day 2025 Theme

- **Theme**: "Aryabhatta to Gaganyaan: Ancient Wisdom to Infinite Possibilities."
- **Significance**: Celebrates India's astronomical heritage from Aryabhatta's era to modern achievements like the Gaganyaan human spaceflight mission.
- **Occasion**: Observed on August 23 to commemorate Chandrayaan-3's historic soft landing on the Moon's south pole, a first for India.

Reasons India Needs a National Space Law

- **Operationalize International Commitments**:
  - India ratified the Outer Space Treaty (1967), which declares space as humankind's province, bans national appropriation, and holds states liable for all space activities (government or private).
  - The treaty requires national laws to enforce its principles, ensuring peaceful use and sustainability. Without legislation, India risks non-compliance internationally.
- **Support Growing Space Economy**:
  - India's space economy (~$9.6 billion, 2% of global $360 billion) could reach $60 billion by 2030, creating over 2 lakh jobs.
  - Indian Space Policy 2023 and IN-SPACe Guidelines 2024 encourage private participation but lack statutory backing, causing uncertainty for startups like Pixxel and Skyroot Aerospace.
- **Regulate Private Sector**:
  - Private entities (e.g., Pixxel's ₹1,200 crore IN-SPACe contract in 2025 for Earth Observation) need clear rules for licensing, liability, and IP.
  - IN-SPACe lacks statutory authority, leading to delays from multiple ministry approvals for dual-use technologies (civilian/military).
- **Address Liability and Affordable Insurance**:
  - The Outer Space Treaty makes India liable for damages from its space objects.
  - Startups face high insurance costs; a law could create affordable frameworks (e.g., government-backed reinsurance), similar to the US or France.
- **Ensure Space Debris Management**:
  - Debris threatens missions like Gaganyaan (2025). A law would enforce mitigation guidelines and active debris removal, aligning with global standards.
- **Protect Intellectual Property (IP)**:
  - Startups need strong IP protections to prevent talent/technology migration to nations like Luxembourg.

8. ISRO completes first integrated air drop test for Gaganyaan

Context

The Indian Space Research Organization (ISRO) successfully carried out its first Integrated Air Drop Test (IADT-1), a critical milestone in preparations for the country's maiden human spaceflight programme, Gaganyaan, on August

- The trial was a joint effort involving the Indian Air Force, Defence Research and Development Organisation (DRDO), Indian Navy, and Indian Coast Guard, showcasing India's whole-of-nation approach to human spaceflight capability.

Gaganyaan Mission Snapshot

ISRO's successful completion of the first Integrated Air Drop Test (IADT-1) for Gaganyaan marks a major leap in India's human spaceflight preparations. This crucial test demonstrated the parachute-based deceleration system that will safely land astronauts from space.

- for final speed reduction.
- The module splashed down safely in the Bay of Bengal, and the parachutes detached automatically.
- The Indian Navy recovered the module; real-time data was recorded and analyzed.

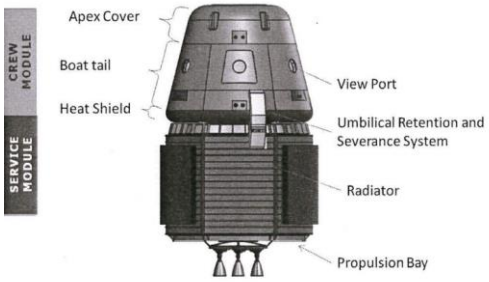


Figure 1 Orbital Module

Aspect	Details
Goal	Indian astronauts in Low Earth Orbit, safe return
Launch Vehicle	Human-rated LVM-3 (GSLV Mk II)
Training	Astronauts trained in Russia, familiarized with weightlessness
Cost	Around ₹9023 crore
Safety Tests	Air Drop (IADT), Pad Abort, uncrewed flights
Next Milestone	Uncrewed Gaganyaan flight end of 2025
Special Feature	Vyomitra robot to simulate humans in second test

Additional Key Systems

- Crew Escape System (CES): An emergency rocket-powered system to quickly separate the Crew Module from the rocket in case of a launch emergency, ensuring astronaut safety.
- Thermal Protection System: Shields the Crew Module from extreme heat during re-entry into Earth's atmosphere.
- Radiation Shielding: Protects astronauts from harmful cosmic rays and space radiation.
- Autonomous Flight and Docking Systems: For navigation, control, and potential future docking with space stations.
- Human-Rated Launch Vehicle (HLVM3): Specifically modified GSLV Mk III rocket to carry the Orbital Module into space.

9. Adi Vaani: India's First AI Tribal Language Translator

Category: Governance, Technology & Inclusive Development | GS Paper II & III

What is in the News?
The Ministry of Tribal Affairs launched Adi Vaani, an AI-powered tribal language translator, developed by IIT Delhi and Tribal Research Institutes.

Key Features
• Preserves endangered tribal languages through digitisation. • Supports real-time translation in Santali, Bhili, Mundari, and Gondi. • Expands access to education, healthcare, and governance for tribal communities.

Significance
• Preserves indigenous knowledge systems. • Promotes inclusive governance and welfare delivery. • Enables education and healthcare outreach in local languages.

Policy Context
Aligned with Digital India, Tribal Affairs initiatives, and UNESCO efforts for indigenous language preservation.

UPSC Keywords
Adi Vaani, Indigenous Languages, Digital Inclusion, Tribal Welfare.

PYQs and Linkages
• GS II (2021): Role of e-governance in inclusion. • Essay (2020): Technology as a bridge, not a barrier.

Conclusion
• GS II (2021): Role of e-governance in inclusion. • Essay (2020): Technology as a bridge, not a barrier.

Health & Medicine (GS-2 / GS-3)

10. Leprosy

Supreme Court Context on Leprosy Laws

- On July 30, 2025, the Supreme Court urged states to repeal ~145 discriminatory laws against leprosy patients (e.g., divorce grounds, office bans) via special sessions, ordinances, or committees, emphasizing dignity under the Constitution.
- Directed NHRC to monitor and states to report by October 2025, noting such laws violate rights and perpetuate stigma.

What is Leprosy?

- A chronic infectious disease, also known as Hansen's disease, that primarily affects the skin, peripheral nerves, mucosal surfaces of the upper respiratory tract, and eyes, leading to disfiguring lesions, numbness, and disability if untreated.
- It is curable and not highly contagious, but stigma persists due to historical misconceptions of it being a curse or hereditary.

Caused By

- Primarily caused by the bacterium *Mycobacterium leprae*, a slow-growing pathogen similar to tuberculosis bacteria.
- Transmitted through prolonged close contact via respiratory droplets from untreated patients, but 95% of people are naturally immune; not spread by casual touch.

Diagnosis

- Based on clinical signs like skin lesions with loss of sensation, thickened nerves, or acid-fast bacilli in skin smears/biopsies.
- Advanced methods include PCR tests or lepromin skin tests to classify type (paucibacillary or multibacillary) for treatment.

Treatment

- Multidrug therapy (MDT) using dapsone, rifampicin, and clofazimine; provided free by WHO, cures 99% of cases in 6-12 months if detected early.
- Post-treatment care includes managing nerve damage or reactions; vaccines like BCG offer partial protection, but no full preventive vaccine exists.

Status of Cases in India and Distribution

- India reports ~120,000 new cases annually (2023 data), with a prevalence rate of 0.45 per 10,000 population; cases declining but stigma delays detection.
- Distribution: Concentrated in Bihar (20% share), Maharashtra, Uttar Pradesh, West Bengal, and Chhattisgarh; higher in rural/slum areas, affecting marginalized groups like SC/ST and migrants.

India's Share in Global Diagnoses

- India accounts for ~60% of the world's ~200,000 annual leprosy cases, making it the highest-burden country despite elimination as a public health problem (prevalence <1/10,000) in 2005.
- Globally, ~75% of cases are in India, Brazil, and Indonesia; India's high share stems from population size, poverty, and delayed reporting.

India declared that it had eliminated leprosy as a public health problem in December 2005, achieving a prevalence rate of less than 1 case per 10,000 people, as per the World Health Organization (WHO)

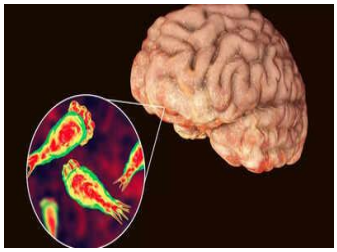
11. Brain-Eating Amoeba

Context

Kerala has recently reported **three new cases** of *Primary Amoebic Meningoencephalitis (PAM)*, a rare but highly fatal infection caused by the so-called **"brain-eating amoeba" (Naegleria fowleri)**. Among the cases, a nine-year-old child has succumbed, intensifying **public health concerns** about water safety and preparedness against emerging infectious diseases.

About Brain-Eating Amoeba (*Naegleria fowleri*)

What is it?



- A **free-living protozoan** (single-celled organism) found naturally in warm freshwater.
- Causes **Primary Amoebic Meningoencephalitis (PAM)**, an acute and usually fatal brain infection.
- Classified as an **opportunistic pathogen**, as it infects humans under specific environmental conditions.

Vector & Transmission

- **Entry Point:** Through the **nasal cavity** when a person swims, dives, or bathes in contaminated water.
- **Pathogenesis:** After entering through the nose, the amoeba travels along the **olfactory nerve** to the brain, where it multiplies and destroys brain tissue.
- **Not spread by:**
  - Drinking contaminated water (since stomach acid kills it).
  - Human-to-human contact.

Where is it Found?

- **Natural Habitat:**
  - Warm freshwater lakes, ponds, rivers, hot springs.
  - Poorly maintained or chlorinated swimming pools, splash pads, and water tanks.
- **Environmental Range:** Survives in **warm conditions up to 46°C (115°F)**, thrives in tropical/subtropical climates.
- **Other sources:** Soil and airborne dust (rare cases).

Symptoms of PAM

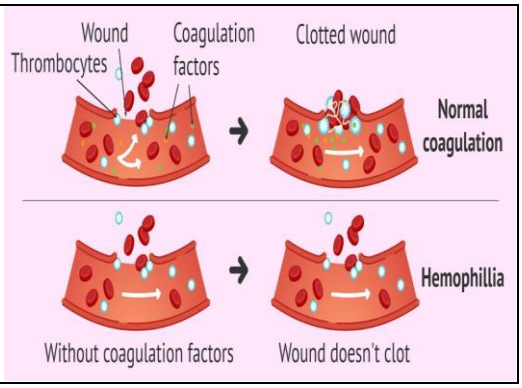
- **Incubation Period:** 2–7 days after exposure.
- **Early Symptoms:** Headache, fever, nausea, vomiting.
- **Advanced Symptoms:** Stiff neck, altered mental status, confusion, seizures, hallucinations, photophobia, and ultimately coma.
- **Progression:** Rapid and severe; most patients die **within 5–18 days** of onset.

Mortality & Survival

- Global survival rate: **~3%**, making it one of the deadliest known infections.
- India (Kerala): Some **rare successful recoveries reported**, largely due to early diagnosis and aggressive combination therapy.

12. Hemophilia

Inherited bleeding disorders due to deficiency of clotting factors → excessive/prolonged bleeding. Noted since the Talmud (c. 200 B.C.E.); "royal disease" spread via a spontaneous mutation in Queen Victoria's X chromosome, affecting European monarchies. X-linked recessive (mostly males; females carriers); ~30% arise from new mutations. Even minor trauma can trigger uncontrolled bleeding.



Causes and Types of Hemophilia

Genetic mutations reduce clotting-factor expression in the coagulation cascade (13 factors).

- **Hemophilia A (80–85%)**: Factor VIII deficiency; India has the **second-highest** global burden (WFH).
- **Hemophilia B (15–20%)**: Factor IX deficiency.
- **Hemophilia C (rare)**: Factor XI deficiency.
  Prevalence: ~1 in 10,000 males globally; India ~1 in 10,000–1 in 50,000; consanguinity raises risk.

Mechanism of Blood Clotting and Hemophilia's Impact

Normal hemostasis: platelet plug + fibrin clot. Missing factors → fragile plug, re-bleeding. Symptoms/complications: prolonged external bleeds; hemarthrosis, muscle/organ bleeds; hemoperitoneum, hemorrhagic stroke, pulmonary hemorrhage; chronic arthropathy, deformities, contractures, stunting, disability. Routine procedures (menstruation, circumcision, tooth extraction) can be life-threatening without treatment.

Hemophilia Situation in India

1.36 lakh cases (majority undiagnosed); ~80% underdiagnosis due to limited screening, coagulation labs, awareness.

- **Demographics: ~1 in 10,000 males**; higher in some **Gangetic belt** pockets; consanguinity relevant.
- **Socioeconomic:** school dropouts, absenteeism, lower social competence, career limits, mental-health burden; constant vigilance in public spaces.
- **Economic:** ~$300,000 (₹2.54 cr) per patient over 10 years (Heliyon, Mar 2024); indirect costs from repeated visits, caregiver time, comorbidities.
- **Regional gaps:** Rural/remote → whole blood, painkillers, RICE; urban centers better but face stock-outs/budget cuts (e.g., Maharashtra → Gujarat spillover in 2023). RPWD Act, 2016 recognition but limited ground impact.

Diagnosis Challenges

Often detected **incidentally** during severe bleeds; **prenatal testing** uncommon in India. Clues: excessive surgical/menstrual/circumcision bleeding; family history. Only **~20%** of cases identified.

Treatment Options: Prophylaxis as the Gold Standard

Shift from historical bandaging (e.g., Prince Leopold) to clotting factor concentrates (CFCs).

- **On-demand (≈96% in India):** after a bleed—reduces pain but **does not prevent** joint damage/progression.

- **Prophylaxis (2–3×/week):** maintains factor levels → fewer bleeds, **less arthropathy/disability**, better mobility/QoL, fewer hospitalizations; in children, prevents stunting and enables normal activity.

Adoption rates: India **~4%**; other developing **>20%**; developed **80–90%**.

Challenges with factors
High cost: India per-capita FVIII = 0.271 IU (vs WFH minimum = 1 IU). **Availability:** Only ~2% of global factors used in India/Bangladesh/Indonesia/China despite ~43% of patients. **Safety/response:** ~20% HCV/other infections from transfusions; inhibitors neutralize infused factors → higher costs/morbidity.

Advanced options
Gene therapy: early Indian experience (CMC Vellore, **2023**, **5 patients**). **Non-factor therapy: emicizumab (Hemlibra)** for inhibitor-positive cases. **Supportive:** tranexamic acid, physiotherapy, pain control. **Kerala**: free prophylaxis for children (model).

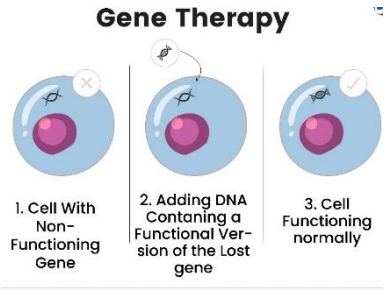
Advances and Path Forward
Gene therapy and Hemlibra show strong outcomes (esp. inhibitors). Prophylaxis is the clinical gold standard; India lags in access/coverage.

Recommendations
• **Access:** district-level diagnostic/treatment hubs; expand Hemophilia Day Care Centres (HDCCs) with physio/rehab. • **Prophylaxis push:** transition from on-demand; long-term cost-effective. • **Awareness & screening:** include prenatal diagnostics in ANC; train frontline workers. • **Home-based care:** self/parent infusion to cut disability and costs. • **Policy & funding:** PPP/NGO/CSR; ethical dosing; stable supply chains. • **Research & inclusion:** build on WFH surveys (2020–24); fully implement RPWD Act for PwH rights.

13. Gene Therapy

What is Gene Therapy

Gene therapy is a cutting-edge medical approach that modifies a person's genes to treat or prevent diseases like hemophilia. It works by introducing, removing, or editing genetic material in cells to correct faulty genes responsible for inherited disorders. For instance, in India, where hemophilia affects an estimated 1.36 lakh people—many undiagnosed—this method could introduce functional clotting factor genes to stop excessive bleeding.



Types of Gene Therapy

Gene therapy is categorized based on the cells targeted:

- **Somatic Cell Gene Therapy**: Focuses on non-reproductive cells, benefiting only the treated individual. This is relevant for Indian patients with hemophilia or other genetic conditions, with changes not passed to children.
- **Germline Gene Therapy**: Modifies reproductive cells, allowing heritable changes. This is controversial and not practiced in India due to ethical and legal restrictions.

Other approaches include adding functional genes (e.g., Factor VIII for hemophilia A), silencing harmful genes, or introducing new genes to fight disease.

How It's Done

Gene therapy in India involves delivering therapeutic genes using vectors:

- **Ex Vivo**: Cells (e.g., blood cells) are taken from a patient, modified in a lab with a gene-carrying
- vector, and reinfused. This could be an option for Indian hemophilia patients in urban centers with advanced lab.
- **In Vivo**: Vectors are injected directly into the body, such as into the bloodstream or liver, targeting cells to produce clotting factors. Trials in India, like those at Christian Medical College, Vellore, use this method.

Delivery Methods

- **Viral Vectors**: Modified viruses (e.g., adeno-associated virus) carry genes safely. These are used in Indian hemophilia trials for long-term effects.
- **Non-Viral Vectors**: Liposomes or nanoparticles offer a safer but less efficient alternative, potentially more accessible in resource-limited settings.

Gene editing tools like CRISPR-Cas9 allow precise DNA repairs, with Indian research exploring localized applications.

Significance

Gene therapy holds immense promise for India, where genetic disorders like hemophilia burden a large population:

- **Curing Genetic Disorders**: Could address hemophilia A and B, reducing lifelong dependency on costly factor concentrates. Trials at Vellore (2023) showed success in five patients.
- **Improved Quality of Life**: Prevents joint damage, deformities, and disability, critical for Indian children who often miss school due to bleeds.
- **Broader Impact**: Offers hope for rare diseases affecting millions across India, reducing economic strain from high treatment costs (e.g., ₹2.54 crore over 10 years for hemophilia).

Challenges
Despite potential, gene therapy faces hurdles in India: • **Safety Risks**: Immune reactions or off-target edits could lead to complications, a concern in a diverse population with varying genetics. • **Delivery Issues**: Reaching rural patients with limited healthcare infrastructure is tough; vectors may not work consistently. • **High Costs**: Treatments could cost millions, far beyond the reach of most Indians, where per capita Factor VIII use is just 0.271 IU. • **Ethical and Access Issues**: Legal restrictions on germline editing; underdiagnosis (80% of cases) delays candidate identification. • **Technical Limits**: Immune responses may reduce efficacy, and repeat treatments are challenging in India's resource-scarce settings.

14. Spinal Muscular Atrophy (SMA)

Spinal Muscular Atrophy (SMA) is a rare genetic disorder that affects motor neurons, the nerve cells controlling muscle movement in the brain and spinal cord. It causes progressive muscle weakness and wasting, making it hard for people to move, swallow, or breathe.

SMA comes in different types based on severity and when symptoms start: Type 0 (severe, before birth), Type 1 (severe, in infants), Type 2 (moderate, in toddlers), Type 3 (milder, in children), and Type 4 (mildest, in adults). Without treatment, severe forms can be life-threatening, but new therapies are helping improve lives.

- **Causes**: SMA happens due to mutations in the SMN1 gene, which makes a protein needed for motor neuron health. Most cases occur when both parents pass on a faulty gene (autosomal recessive inheritance). The SMN2 gene can lessen severity depending on how many copies are present. It's not caused by the environment but can be more common in families with close relatives marrying.
- **Symptoms**:
  - Type 0/1: Floppy baby, weak cry, trouble breathing or swallowing, can't sit up; often fatal by age 2 without help.
  - Type 2: Delayed milestones like sitting but not walking, scoliosis, breathing issues.
  - Type 3/4: Trouble walking, frequent falls, tiredness; milder cases allow independent living.
  - Other problems: Joint stiffness, curved spine, swallowing difficulties, lung infections.
  - Note: Thinking skills usually stay normal.

Diagnosis

- Done with a blood test to check for SMN1 mutations.
- Prenatal screening (like amniocentesis) if there's family history.
- Newborn screening with a heel prick test is growing but not widespread.
- Doctors may use nerve tests or muscle biopsies to confirm.
- Early detection is key but often delayed due to limited testing.

Treatment:

- No cure, but treatments slow the disease.
- **Risdiplam**: An oral drug to boost SMN protein daily.
- **Nusinersen**: Injections into the spine to help SMN2 work better.
- **Zolgensma**: A one-time gene therapy, best for infants.
- Supportive care includes physiotherapy, breathing support, nutrition help, and braces or surgery for spine issues.
- Starting treatment early, even before symptoms, works best.

Concerns:

- Treatments like Zolgensma ($2.1 million) or Risdiplam ($340,000/year) are very expensive.
- Not everyone can access them, especially in poor areas.
- Delays in diagnosis mean missing the best treatment time.
- Side effects like infections from injections can happen.
- Families face emotional and financial stress; no full cure yet.

Situation in India:

- Affects about 10,000-15,000 people, but many go undiagnosed.
- Seen in 1 in 7,000-10,000 births; more common where relatives marry.
- Costs are huge (Risdiplam ~₹1-2 crore/year), and facilities are limited, especially in villages.
- Government helps with up to ₹50 lakh under the Rare Diseases Policy (2021); Kerala's KARE program gives free Risdiplam to ~100 patients.
- A 2025 case at SAT Hospital treated a newborn before symptoms with prenatal screening—a first in India.

15. Supreme Court's Stray Dog Order

India faces **52–60 million stray dogs** (Delhi-NCR: ~0.5–1 million), causing rising **rabies deaths (30,000+ annually)** and safety concerns. In a suo motu case, the Supreme Court ordered removal of all stray dogs in **Delhi-NCR** to shelters.

Key Directives

1. **Core Order**: Capture and relocate all free-ranging dogs to shelters within 8 weeks; no release back.
2. **Shelters**: Must provide sterilization, vaccination, CCTV, staff, food, and medical care.
3. **Rationale**: Escalating bites, rabies prevention

Implications

Positive

- Enhances **urban safety**, upholding Article 21 (right to life).
- Reduces rabies transmission, restores citizen confidence.
- Judicial activism on public health.

Challenges

- Contradicts **Animal Birth Control (ABC) Rules, 2001/2023** advocating CNVR (Catch-Neuter-Vaccinate-Release).
- **Infrastructure stress**: No capacity for 1m dogs; risks overcrowding, neglect, or covert euthanasia.
- **Fiscal strain**: Billions needed for land, staff, and care.
- **Legal conflict**: Goes against earlier SC "no-cull" stance.
- **Social-ecological**: Dogs control pests; removal without waste mgmt reforms won't solve root issue.
- **Animal rights**: Seen as inhumane; backlash from PETA, FIAPO.

Rabies: Public Health Threat

- **Cause**: Rabies virus (Rhabdoviridae); spreads via saliva of infected animals (99% from dog bites).
- **Prevention**:
  - **Pre-Exposure Prophylaxis (PrEP)** for high-risk groups (vets, forest staff).
  - **Post-Exposure Prophylaxis (PEP)**: wound cleaning + 4–5 vaccine doses + immunoglobulin → nearly 100% effective if timely.
  - **Mass dog vaccination (70% coverage)** critical to break transmission cycle.

Way Forward for India

- **Balanced Approach**: Blend **public safety** with **animal welfare**.
- Scale up **CNVR programs** under ABC Rules; target **70% vaccination**.
- Integrate with **"One Health" strategy** for zoonoses.
- Strengthen **urban waste management** to cut food sources.
- Expand **PEP availability** and **awareness campaigns**.
- Judicial directions must harmonize with prior SC rulings + statutory rules.

Conclusion

- The SC's judgment reflects urgency on **public health and safety**, but risks undermining humane, globally proven models.

16. Anti-Conversion Laws

Anti-conversion laws in India are state-level legislations aimed at preventing religious conversions through force, fraud, inducement, or allurement, while ensuring voluntary conversions are permitted. These laws align with **Article 25** of the Constitution, which guarantees freedom to profess, practice, and propagate religion, subject to public order, morality, and health. No central law exists, as the Union Law Ministry (2015) stated Parliament lacks legislative competence. Private Member Bills to regulate conversions have been introduced since 1954 but never passed.

States with Anti-Conversion Laws (as of August 2025):

- **Odisha (1967)**, **Madhya Pradesh (1968, 2021)**, **Arunachal Pradesh (1978)**, **Chhattisgarh (2000, 2006)**, **Gujarat (2003)**, **Himachal Pradesh (2006, 2019)**, **Jharkhand (2017)**, **Uttarakhand (2018)**.
- **Repealed/Blocked**: Tamil Nadu (2002, repealed 2006 after protests); Rajasthan (2006, 2008, blocked by Governor/President).
- **Recent Ordinances**: Uttar Pradesh (2020), Madhya Pradesh (2021).

17. Honour killing

Honour killing refers to the murder or violent punishment of a family member, typically a woman or girl, by relatives or community members to restore perceived "honour" that has been tarnished by the victim's actions. These actions often involve breaching social norms, such as choosing a romantic partner from a different caste, religion, or economic background, engaging in premarital relationships, or displaying gender non-conforming behavior.

Causes of Honour Killings

- **Patriarchy**: Women lack agency in romantic choices; marriage preserves caste, lineage, and property. Family honour is linked to a woman's chastity and obedience to caste norms.
- **Caste System**: Inter-caste unions, especially involving higher-caste women, trigger violence to maintain purity. Family prioritizes ascribed social status over individual choice.
- **Cultural Norms**: Khap panchayats and community councils enforce endogamy, often unreported as "private matters."
- **Other Factors**: Religious differences ("love jihad"), economic disparities, and resistance to women's changing status. Men face blame for "transgressions."

Triggers:

- Inter-caste or inter-religious relationships.
- Pre-marital sex or unapproved love affairs.
- Refusal of arranged marriages.
- Same gotra (lineage) marriages opposed by khap panchayats.

State's Failure

The Indian state has not effectively addressed honour killings due to systemic patriarchal and casteist biases, underreporting, and lack of preventive measures.

- **Data Gaps**: NCRB reported 25 cases in 2020, 33 in 2021, but NGO Evidence found 195 in Tamil Nadu alone over five years, showing underreporting due to misclassification.
- **No Preventive Support**: International standards advocate shelters and legal aid, but India focuses on post-incident action.
- **Police/Judicial Inaction**: Biased policing and weak enforcement persist despite court reprimands (e.g., Deepika vs State of U.P., 2013).
- **Systemic Issues**: Regressive laws like anti-conversion acts prioritize control over autonomy. The state's inaction reflects alignment with caste-patriarchy.

Current Gaps:

- No specific national law; honour killings fall under general IPC provisions (e.g., Sections 299-304 for murder, 107-116 for abetment).
- SC/ST Act, 1989 applies to caste-based atrocities but lacks focus on honour killings.
- Proposed laws (e.g., Rajasthan Bill, 2019) and NCW drafts remain unenforced.

Supreme Court Judgements

- **Lata Singh v. State of UP (2006)**: Affirmed right to marry (Article 21), ordered police protection for couples.
- **Shakti Vahini v. Union of India (2018)**: Banned khap interference, mandated FIRs, fast-track courts (6 months), and safe houses. the Supreme Court upheld the rights of the individual to marry by choice. It condemned honour killings as a violation of personal liberty and recommended strict action against Khap Panchayats.

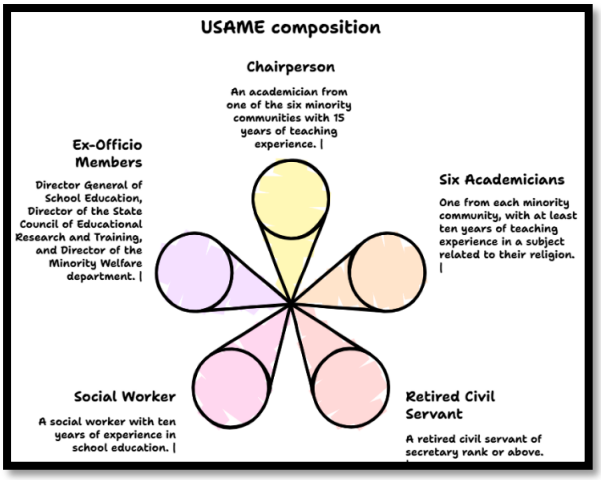
18. Uttarakhand's Bill to govern minority educational institution

Paper: GS - II, **Subject:** Polity**,** Topic**:** Legislature,

Context : The bill is a pioneering piece of legislation aimed at regulating and standardizing minority educational institutions in Uttarakhand, extending benefits to Sikh, Jain, Christian, Buddhist, and Parsi communities, which were previously limited to Muslim-run institutions.

Key Provisions of the Bill

- **Inclusive Minority Status**:
  - Extends minority educational institution status to Sikh, Jain, Christian, Buddhist, and Parsi communities, moving beyond the earlier Muslim-only framework.
  - Recognizes the teaching of **Gurmukhi** and **Pali** languages in minority institutions from **July 1, 2026**, promoting cultural and linguistic diversity.



19. National Sports Governance ACT, 2025

- **Ministry**: Youth Affairs and Sports.
- **Introduced**: President Assent
- **Purpose**: Regulates and recognizes national sports bodies to enhance governance and development in sports.

The National Sports Governance Bill seeks to provide for recognition of national sports bodies and regulate their functioning. The Bill provides for the establishment of the National Olympic Committee, National Paralympic Committee, and National and Regional Sports Federations for each designated sport. The national bodies will have affiliation with respective international bodies. The bill provides that every national sports body will have a general body, consisting of an equal number of representatives from each affiliate member and certain ex-officio members. It will have an executive committee consisting of up to 15 members, with at least two outstanding sportspersons and four women. The Bill empowers the central government to establish a National Sports Board which will grant recognition to the national sports bodies and register their affiliate units. The Bill also provides for constituting a National Sports Tribunal to adjudicate sports related disputes.

Key Provisions

- **National Sports Governing Bodies**:
  - Establishes **National Olympic Committee**, **National Paralympic Committee**, and **National/Regional Sports Federations** per sport, affiliated with international bodies.
  - The Act empowers the central government to establish a National Sports Board which will grant recognition to the national sports bodies and register their affiliate units
  - Requires state/district affiliate units, committees, a **code of ethics** (for members, athletes, coaches, sponsors), and a **grievance redressal mechanism**.
  - Governed primarily by international charters; central government resolves conflicts.
- **Administrative Structure of National Sports Governing Bodies**:
  - **General Body**: Equal representation from affiliates, plus ex-officio members.
  - **Executive Committee**: Up to 15 members, including 2 outstanding sportspersons and 4 women; age 25-70 (up to 75 with international approval).
  - **Leadership**: President, Secretary General, Treasurer must be eminent sportspersons or have served two executive terms; max 3 consecutive terms.

- **National Sports Board (NSB)**:
  - Central government sets up NSB to recognize/register sports bodies, fund only recognized ones, and suspend/cancel recognition if needed.
  - Functions: Issues ethics guidelines, probes welfare/fund misuse, forms ad-hoc bodies if international recognition is lost.
  - Composition: Chairperson and members with expertise in administration, sports law, etc., appointed via a search committee.
  - The Chairperson and Members of NSB will be appointed by the Central Government.

- **National Sports Tribunal**:
  - Adjudicates sports disputes (excludes international games/internal body issues).
  - Composition: Chairperson (sitting/former SC Judge or Chief Justice), 2 members (sports/admin/law experts), appointed by a committee (CJI or nominee, Law Secretary, Sports Secretary).
  - Powers: Civil court-like; appeals to SC unless international rules mandate the Court of Arbitration for Sport.
- One of the key facets of the Bill is the Safe Sport Policy, which addresses mandatory adoption of athlete protection frameworks, grievance redressal mechanisms, and safeguards against harassment, especially for women, divyang and minors
- **Oversight of Elections**:
  - Central government forms a national panel of electoral officers; each body must have its own electoral panel for affiliate elections.
- **Central Government Powers**:
  - The Chairperson and Members of NSB will be appointed by the Central Government.

20. National Anti-Doping (Amendment) Act, 2025

Overview
• **Enactment**: The National Anti-Doping (Amendment) Bill, 2025, was passed by Lok Sabha on August 11, 2025, Rajya Sabha on August 12, 2025, and received President Droupadi Murmu's assent on August 18, 2025, becoming the National Anti-Doping (Amendment) Act, 2025. It amends the National Anti-Doping Act, 2022. • **Purpose**: Strengthens India's anti-doping framework, aligning with the UNESCO Convention and World Anti-Doping Agency (WADA) standards to ensure fair play and athlete welfare. • **Context**: Introduced on July 23, 2025, to address WADA's concerns over government interference and enhance NADA's autonomy, supporting India's 2036 Olympics bid.

Important Provisions
• **Prohibition of Doping**: The Act explicitly bans athletes, support personnel, and other individuals from using prohibited substances to improve performance, strictly adhering to the guidelines outlined in the World Anti-Doping Code (WADA Code). • **National Anti-Doping Agency (NADA)**: NADA is empowered to conduct doping tests, enforce anti-doping regulations, and investigate violations, now operating with greater independence from the government, sports federations, and Olympic/Paralympic bodies. • **National Board for Anti-Doping in Sports**: The Board continues to exist but has lost its authority to oversee NADA and the Appeal Panel; it now only advises the central government without direct control over these entities. • **Appeal Panel Authority**: The power to establish the Appeal Panel and define its procedures has been transferred from the National Board to the central government, ensuring a more organized and government-regulated appeal process. • **Limited CAS Appeals**: Only specific organizations, such as the World Anti-Doping Agency (WADA), International Olympic Committee

21. The Promotion and Regulation of Online Gaming Bill, 2025

The **Promotion and Regulation of Online Gaming Bill, 2025**, passed by the Lok Sabha on August 20, 2025, and Rajya Sabha on August 21, 2025, and assented by President Droupadi Murmu on August 22, 2025, bans real-money gaming (RMG) while promoting e-sports and social gaming. It targets platforms like **Dream11**, **MPL**, and **PokerBaazi**, significantly impacting India's $3.8 billion gaming industry.

Context

- **Industry Growth**: India's online gaming sector, valued at $3.8 billion in FY24, is projected to reach $9.1 billion by 2029 (20% CAGR). RMG (e.g., fantasy sports, poker, rummy) accounts for ~86% of revenue ($2.4 billion).
- **Social Concerns**: Rising addiction, financial distress, and fraud linked to RMG platforms (e.g., Enforcement Directorate froze ₹284 crore of Probo Media in July 2025 for illegal gambling).
- **Previous Regulation**: IT Rules 2023 proposed self-regulation, but no self-regulatory bodies were approved due to independence concerns. State bans (e.g., Karnataka) were overturned, as courts distinguished skill-based games (e.g., Dream11) from chance-based gambling.

Provisions

- **Ban on Real-Money Gaming**:
  - Prohibits offering, aiding, or promoting online money games (games involving monetary stakes for winnings, regardless of skill or chance).
  - Applies to platforms like Dream11, MPL, My11Circle, PokerBaazi, RummyCircle, Games24x7, WinZO, Zupee, and offshore apps like Parimatch.
  - Bans advertisements and financial transactions (banks barred from processing payments).
- **Penalties**:
  - Operators: Up to 3 years imprisonment and/or ₹1 crore fine.
  - Promoters (e.g., influencers, celebrities): Up to 2 years imprisonment and/or ₹50 lakh fine.
  - Financial facilitators face similar penalties.
- **Regulatory Framework**:
  - **Ministry of Electronics and IT (MeitY)** oversees compliance, licensing, and monitoring.
  - Establishes **National Online Gaming Commission (NOGC)** to classify games, enforce rules, and promote e-sports.
- **Promotion of E-Sports and Social Games**:
  - Recognizes e-sports (e.g., Real Cricket, Free Fire) as competitive sports; allows prize money for performance.
  - Permits social/educational games (e.g., Ludo, Candy Crush) without monetary stakes.
- **Enforcement**:
  - Blocks RMG platforms under Section 69A of IT Act, 2000.
  - Allows warrantless searches of physical and virtual spaces.
- **User Protection**:
  - Addresses addiction, financial fraud, and money laundering via audits and transaction tracking.

22. Nuclear Laws and the Role of Opposition

Paper: GS - III, **Subject:** Science and Technology**,** Topic**:** Nuclear Energy

Context: India's pursuit of energy security and climate change mitigation is closely linked to the expansion of nuclear power. To facilitate this, the government is considering amendments to the **Civil Liability for Nuclear Damages Act (CLNDA), 2010** and the **Atomic Energy Act (AEA), 1962**.

Context

Legislative amendments to two key laws governing India's atomic energy sector are underway to align with global standards, address investor concerns, and open the civil nuclear sector to private players. Announced in the 2025 Union Budget and reinforced during PM Modi's February 2025 visits to the US and France.

- **Acts Involved**:

1. **Civil Liability for Nuclear Damage Act, 2010 (CLNDA)**.
2. **Atomic Energy Act, 1962**.

Changes and Provisions

- **Civil Liability for Nuclear Damage Act, 2010 (CLNDA)**:
  - **Original Intent**: Establishes a no-fault liability regime for nuclear accident victims, capping operator liability at ₹1,500 crore (with government covering excess) and allowing recourse against suppliers under Section 17.
  - **Key Amendment**: Dilutes Section 17(b), which permits operators (e.g., NPCIL) to seek recourse from suppliers for defects or sub-standard services, aligning it with the 1997 Convention on Supplementary Compensation (CSC) that limits liability to operators.
  - **Additional Changes**:
    - Caps supplier liability to the contract value and imposes a time limit on claims.
    - Clarifies the definition of "supplier" (Rule 24) to exclude small domestic sub-vendors, addressing concerns of firms like L&T and Walchandnagar.
    - Around 11 amendments are proposed, including structured appeal processes managed by the central government.
- **Atomic Energy Act, 1962**:
  - **Original Intent**: Restricts nuclear power generation to state-owned entities (e.g., NPCIL, NTPC).
  - **Key Amendment**: Enables private companies, including potential foreign minority stakes, to operate nuclear plants, facilitating Public-Private Partnerships (PPPs).
  - **Additional Changes**: Supports Small Modular Reactors (SMRs) and broadens private sector roles in mining, importing, and processing uranium.

Past Debates

- **Indo-U.S. Nuclear Deal (2007):** Sparked discussions on amending the AEA to allow greater private involvement.
- **Raja Ramanna Committee (1997):** Studied compensation frameworks for nuclear damage.
- **Legislative Resistance:** Previous reforms (e.g., Patents Act, 1999; Insurance Laws; Land Boundary Agreement) faced significant opposition delays, reflecting domestic sensitivities over sovereignty and accountability.

23. The Forest (Conservation) Act, 1980

- The Forest (Conservation) Act enforced from **October 25, 1980**.
- Requires **prior Central Government approval** for diversion of forest land for non-forest purposes.
- Objective: balance **development needs with conservation of natural heritage**.
- Guidelines issued to simplify procedures and reduce delays.

The Godavarman Judgement, 1996

Key Provisions of the Amendment Act, 2023

- **Clarification of Scope**: Applies to land declared/notified as forest under law or recorded as forest in government records on/after 25 Oct 1980.
- **Exemptions**: Land within 100 km of international borders/LOC/LAC (strategic projects).
- Up to 10 hectares for security infrastructure.
- Defence/paramilitary/public utility projects.
- Land along rail/road for habitation access.
- **Permitted Activities Expanded:** Zoos, safaris, eco-tourism, silviculture, forest staff infrastructure.
- **Removal of Consent:** Gram Sabha/tribal consent no longer mandatory for diversion

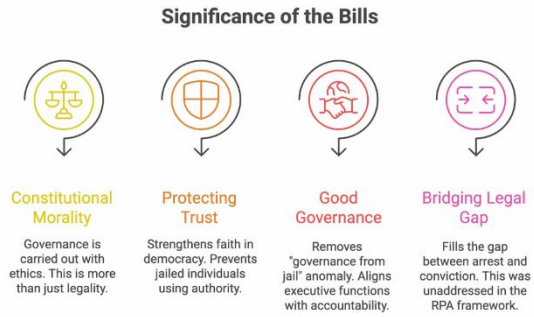
Issue	Example	Impact
Land rights for select groups	Only some STs eligible	Community disputes, unrest
Lack of proper survey	40,520 certificates without geo-reference	Ownership confusion
Rejected claims still occupied	18.39 lakh rejections	Ongoing illegal occupation
Encroachment after cutoff date	Guttikoya migration	More claims, forest loss
Wildlife habitat fragmentation	East Godavari, Warangal	Loss of corridors, animal population drop

Government's Defence

- **Unclear Records:** Exemptions needed to resolve ambiguities and allow development near roads/rail.
- **Security Justification:** Special provisions for national security projects.
- **Practicality vs SC Verdict:** Lands recorded before 1980 but not notified as forests won't be protected, ensuring clarity and development flexibility.

24. The Constitution (130th Amendment) Bill, 2025

The Constitution (130th Amendment) Bill, 2025, proposes the automatic removal of the Prime Minister, Chief Ministers, or any central or state ministers if they are jailed for 30 consecutive days on serious criminal charges. This proposal has sparked intense controversy and strong opposition.



Key Provisions of the Bill

- The bill amends Articles 75, 164, and 239AA of the Constitution to ensure that any minister, including the Prime Minister or Chief Ministers, detained for 30 consecutive days for offences punishable with a prison term of five years or more will lose their office.
- The removal is automatic if the respective Chief Minister or Prime Minister does not recommend removal to the President or Governor, as applicable, by the 31st day of detention.
- Ministers who are released and not convicted can be reappointed once freed from custody.

Rationale and Government Arguments

- The government, especially Home Minister Amit Shah, presents the bill as necessary for upholding political integrity, public morality, and accountability. They argue that it addresses public anger over politicians continuing to govern from jail.
- Supporters say the amendment fills a constitutional gap, as some ministers in the past have refused to step down even after being arrested on serious charges.

Opposition and Criticisms

- Opposition parties argue the bill is "anti-federal" and could give the Centre excessive powers to destabilize state governments by targeting and arresting opposition leaders.
- Critics contend it undermines the legal principle of presumption of innocence, separation of powers, and due process, since removal is based on arrest and detention, not on conviction.
- There are concerns about the possible misuse of central investigative agencies to target opposition leaders and the unreliability of detention as a basis for removal, especially given low conviction rates and stringent bail provisions.

Current Status

- Following uproar in Parliament, the bill has been sent to a Joint Parliamentary Committee for further examination and is not yet law.
- Opposition parties have pledged to oppose the bill, asserting it poses risks to India's federal structure and democracy.

Key Issues & Viewpoints		
Aspect	**Government Rationale**	**Opposition Critique**
Removal Trigger	30 days jail on serious charge	Based on arrest, not conviction
Impact on Democracy	Promotes clean governance	Anti-federal, risks misuse
Legal Safeguards	Reappointment after release	Violates due process, presumption of innocence
Agency Concerns	No comment	Possible misuse by central agencies

25. Master of Roster in High Courts

The "Master of Roster" is the exclusive authority of the High Court Chief Justice (CJ) to allocate cases, assign benches, and manage rosters, ensuring efficiency and preventing "bench hunting." Confirmed by SC rulings like State of Rajasthan v. Prakash Chand (1998) and Campaign for Judicial Accountability and Reforms v. Union of India (2018), it upholds institutional integrity.

Recent Controversy in Allahabad High Court (August 2025)
• **Initial SC Order (August 4)**: SC bench quashed an "absurd" order by Justice Prashant Kumar in a corruption case, directing the HC CJ to bar him from criminal matters for "institutional integrity."
• **Remarks**: Labeled the order a "threat to rule of law" due to legal ignorance, sparking overreach debate.
• **Retraction (August 8)**: After CJI intervention, SC recalled the directive, leaving roster decisions to HC CJ and citing a Full Court resolution for non-compliance.

SC Remarks on Overreach
• Initial directive addressed institutional concerns, not roster control, but retraction affirmed HC CJ's sole authority unless grave miscarriage of justice.

Tirupati Balaji Case (2004)
• In Tirupati Balaji Developers Pvt. Ltd. v. State of Bihar, SC limited its Article 227 powers over HCs, viewing itself as an "elder brother" for guidance, not dictating administration like rosters.
• Reaffirmed HC CJ as sole Master of Roster, with no SC interference absent grave injustice.

26. The North Eastern Council (NEC)

The North Eastern Council (NEC) is a regional planning body for the eight states of Northeast India: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. Established in 1971, its primary goal is to promote balanced and coordinated socio-economic development in the region. Initially an advisory body, it was later mandated to act as a regional planning body after an amendment to the NEC Act in 2002

- **Formation and Mandate:**

The NEC was established by the North Eastern Council Act, 1971. It was initially an advisory body focused on coordinating development efforts among the northeastern states. The 2002 amendment empowered it to function as a statutory regional planning body.

- **Key Functions:**

NEC's primary objective is to facilitate the balanced and coordinated development of the North Eastern Region. This includes promoting economic and social development, and ensuring effective coordination among the member states.

- **Composition:**

The council comprises Governors and Chief Ministers of the eight northeastern states, along with three members nominated by the President. The Union Home Minister serves as the ex-officio Chairman, and the Minister of DoNER (Development of North Eastern Region) is the ex-officio Vice-Chairman

Achievements of the North Eastern Council (NEC)

- **Improved Connectivity**:
  - Constructed 10,500 km of roads with NEC funding, enhancing inter-state connectivity and handed over to states for maintenance.
  - Influenced the Ministry of Road Transport and Highways through the Perspective Plan 2001 for regional road infrastructure development.
- **Power Infrastructure**:
  - Supported installation of 694.5 MW power plants and construction of 2,540.41 km of transmission and distribution lines.
- **Transportation Hubs**:
  - Completed 9 out of 11 Inter-State Bus Terminus (ISBT) projects across states; 2 under construction in Meghalaya and Manipur.
  - Finished 3 Inter-State Truck Terminus (ISTT) projects (2 in Assam, 1 in Nagaland); 1 under construction in Tripura (Jirania).
- **Airport Development**:
  - Upgraded infrastructure at 5 major airports (Guwahati, Dibrugarh, Jorhat, Imphal, Umroi) with a 60:40 NEC-AAI funding split.
  - Completed hangars and apron extensions at LGBI Airport (Guwahati) and Jorhat Airport; advanced progress at other three.
  - Achieved 60% completion of a new airport in Tezu, Arunachal Pradesh, under NEC funding.
- **Sustainable Livelihoods**:
  - Implemented NERCORMP (Phases I-III) with IFAD support, covering 2,503 villages across Assam, Meghalaya, Manipur, Arunachal Pradesh, transforming lives of over 119,000 rural women.
- **Sports Promotion**:
  - Awarded "Chairman's Sports Award" to 207 sportspersons from NER for medals in Olympics, Asian Games, Commonwealth Games, and National Games since 2008-09.
  - Organized 6 editions of the "NEC Dr. T. Ao Memorial Football Tournament" to nurture football talent.

- **Sectoral Development**:
  - Supported projects in education, healthcare, agriculture, horticulture, tourism, and industries, with details available under respective sectors.

Ongoing Hurdles

- **Financial Limitations**: Relies heavily on Central funds, often insufficient for ambitious projects.
- **Implementation Delays**: Bureaucratic hurdles and terrain issues slow progress.
- **Socio-Political Factors**: Ethnic conflicts and insurgency disrupt initiatives.
- **Coordination Gaps**: Challenges in aligning state and Central priorities.
- **Environmental Concerns**: Balancing development with NER's fragile ecology, like in hydropower projects.

27. Biofortification in India

Biofortified Potatoes
○ Iron-fortified varieties to hit Indian markets soon; first released in Peru (high iron deficiency). ○ CIP shared germplasm with ICAR's Central Potato Institute (Shimla) for adaptation.

Biofortified Sweet Potatoes
○ Vitamin A-enriched varieties grown in Karnataka, Assam, West Bengal, Odisha. ○ CIP aims to expand seed access for farmers. 

India's Potential
○ Major potato producer; growing sweet potato sector for global supply. ○ Focus on processing to reduce price fluctuations.

India Operations
○ Active since 1975 with ICAR; South Asia Regional Centre in Agra (2025) to enhance seed access, market stability, and nutrition (e.g., mid-day meals). ○ Collaborates for iron-fortified potatoes (germplasm to ICAR-CPRI, Shimla) and vitamin A-rich sweet potatoes (grown in Karnataka, Assam, West Bengal, Odisha).

Biofortification
Biofortification is the process of enhancing the nutritional value of crops during growth through breeding, agronomic practices, or biotechnology, unlike fortification, which adds nutrients post-harvest. It targets deficiencies in iron, zinc, and vitamin A, especially in low-income groups reliant on staple crops.

Key Features of Biofortification

- **Purpose**: Addresses "hidden hunger" (micronutrient deficiencies); improves health in rural/poor communities with limited access to diverse diets or supplements.
- **Methods**:
  - **Conventional Breeding**: Crossbreeding high-nutrient varieties with high-yielding ones (e.g., Harvest Plus programs).
  - **Agronomic Practices**: Applying micronutrient-rich fertilizers (e.g., zinc foliar sprays).
  - **Transgenic/Biotech**: Genetic modification for nutrients absent in crops (e.g., Golden Rice for vitamin A).
- **Crops Targeted**: Staples like wheat, rice, maize, cassava, sweet potato, beans; others like potatoes, tomatoes.
- **Impact**: Reaches over 20 million people in 40+ countries; cost-effective, sustainable (one-time investment, no recurring fortificant costs)

28. Sacred Groves in India

What are Sacred Groves

Sacred groves are community-regulated and conserved patches of forest land. They are created and managed traditionally by communities in various ways deeply rooted in their identity. The groves are kept inviolate through customary laws and taboos, many of which completely prohibit the extraction of any resources in any form, except for custodians to access medicinal plants. The grove's conservation ethos is strongly linked to piety and sanctity, enforced in terms of the community's relationship with its spirits and gods.

India is estimated to have 1-10 lakh sacred groves of this nature — the highest in the world. They are called '*devara kadu*' in Karnataka, '*devban*' in Himachal Pradesh, '*kavu*' and '*sarpa kavu*' in Kerala, '*sarna*' in the Chota Nagpur Plateau region, '*devbani*' in Chhattisgarh, etc.

Importance:

- Link nature and culture, preserving cultural identity.
- Conserve biodiversity, hosting endemic/rare species.
- Protect freshwater sources (ponds, springs) and recharge aquifers.
- Prevent soil erosion through vegetative cover.

Types

- **Traditional Sacred Groves**: Dedicated to village deities with symbolic representations.
- **Temple Groves**: Forests around temples, conserved for religious reasons.
- **Burial/Cremation Groves**: Areas around burial or cremation grounds.

Distribution

- Found nationwide, abundant in Western Ghats (Kerala, Karnataka) and Central Plateau (e.g., ~600 in Chhattisgarh).
- Estimated 100,000–150,000 groves across India.

Threats

- Declining traditional beliefs, replaced by superstitions or temple worship ("Sanskritisation").
- Urbanization, infrastructure projects (roads, dams), and commercial forestry causing destruction/encroachment.
- Exotic weed invasions (e.g., Lantana camara) and pressure from livestock/fuelwood collection.

Conservation Strategies

- **Inventorisation**: Document groves and gather vital data.
- **Community Involvement**: Engage village chiefs, elders, priests for consent and participation.
- **Zonation**: Define core (protected) and buffer zones for sustainable development.
- **Afforestation**: Plant medicinal/religious species in both zones.
- **Infrastructure**: Install fencing, water sources, community shades.
- **Methodology**: Local meetings to plan zonation, activities (fencing, planting), and conservation plans, approved by forest officials and state CAMPA, with anthropologist input if available.
- **Cost**: ~₹1 lakh/hectare, varying by project (fencing, planting, infrastructure).

29. Red Panda Cubs Born in Sikkim After 7 Years

Red Panda
• **Common Name**: Red Panda (also called "lesser panda") • **Scientific Name**: *Ailurus fulgens* • **Appearance**: Resembles a house cat in size, with a longer, bushy tail; reddish-brown fur, white face markings, and a bear-like face. • **Behavior**: Shy, solitary, arboreal (tree-dwelling); primarily herbivorous, feeding mostly on bamboo; uses tail for balance and warmth in cold climates.

Habitat
• **Geographic Range**: Mountain forests of the Eastern Himalayas and southern China. • **Countries**: India (Sikkim, Arunachal Pradesh, West Bengal), Nepal, Bhutan, China, Myanmar. • **Environment**: Temperate forests with dense bamboo undergrowth, typically at altitudes of 2,200–4,800 meters.

Conservation Status

• **IUCN Red List**: Endangered (population declining).
• **CITES**: Appendix I (strict ban on international trade).
• **India's Wildlife Protection Act (1972)**: Schedule I (highest legal protection).
• **Main Threats**:
  ○ Habitat loss due to deforestation and agricultural expansion.
  ○ Bamboo depletion, critical for their diet.
  ○ Poaching and illegal pet trade.
  ○ Climate change impacting high-altitude ecosystems.

Ecological Role
• **Indicator Species**: Red pandas signal forest ecosystem health; their decline warns of broader issues like biodiversity loss or environmental degradation. • **Biodiversity Impact**: Their presence supports monitoring of Himalayan ecosystem stability, vital for other species and human communities.

Recent Conservation Success
• **Event**: Two cubs born at Himalayan Zoological Park, Sikkim, after a 7-year gap (August 2025).

30. Mithun

Overview

- **Common Name**: Mithun (also called Gayal or "cattle of the mountain")
- **Scientific Name**: *Bos frontalis*
- State animal of Arunachal and Nagaland
- **Appearance**: Resembles a smaller Indian bison (Gaur); muscular build with a flat, broad inverted-triangle face; curved horns (whitish-yellow to black); blackish-brown coat with lighter forehead (white or yellowish); weighs 400–650 kg.
- **Behavior**: Semi-domesticated, lives freely in forests but herded by tribes; forms small herds (1–2 males with females and calves); provides meat, milk, and draft power; originated from wild Gaur over 8,000 years ago.
- Mithun cannot be used for large scale dairy farming because it produces very less quantity of milk.

Habitat

- **Geographic Range**: Hilly tropical rainforests of Northeast India and adjacent regions.
- **Countries**: India (Arunachal Pradesh, Nagaland, Manipur, Mizoram, Assam), Myanmar, Bhutan, Bangladesh.
- **Environment**: Bamboo-rich forests and grasslands at altitudes of 300–3,000 meters; thrives in remote, mountainous areas.

Conservation Status

- **IUCN Red List**: Vulnerable (population declining).
- **CITES**: Appendix I (strict ban on international trade).
- **M-Anitra app** is a digital platform for Mithun, to get Mithun farmers information on request. M-Anitra helps easy and swift Mithun monetization for free of cost by ICAR
- **India's Wildlife Protection Act (1972)**: Not directly listed, but protected under livestock and biodiversity laws.(being requested for Schedule 1)
- Adi tribes in Arunachal Pradesh celebrate' Soulung 'festival to honour Mithun
- **Main Threats**:
  - Habitat fragmentation due to deforestation and agriculture.
  - Indiscriminate slaughter and unscientific farming.
  - Interbreeding with domestic cattle, diluting genetics.
  - Lack of government support schemes, leading to population decline.

31. The International Big Cat Alliance (IBCA)

It is a global initiative launched by India in 2023 to conserve seven big cat species: Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, and Puma. Established through the National Tiger Conservation Authority (NTCA) under the Ministry of Environment, Forest and Climate Change (MoEFCC) in 2024, it fosters collaboration among countries to protect these cats and their habitats.

Announcement

- **When**: The IBCA was announced by Prime Minister Narendra Modi on **April 9, 2023**, during the 50th anniversary of Project Tiger in Mysuru, Karnataka. The idea was first proposed in 2019 during Global Tiger Day.
- **Why**: To unite 95 range countries (where big cats naturally live) and others for the conservation of seven big cat species (Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, Puma), addressing threats like habitat loss, poaching, and human-wildlife conflict. It builds on India's Project Tiger success (tiger population grew from ~1,800 in 1970 to ~3,600 in 2022).

32. Rediscovery of the Barbados Threadsnake

- **What**: The Barbados threadsnake (*Tetracheilostoma carlae*), the world's smallest snake (~10 cm, pinky-sized), was rediscovered on March 20, 2024, after being "lost to science" for nearly 20 years.
- **Announcement**: Re:wild and Barbados Ministry of Environment announced on July 23, 2024.

- **Features**:
  - Endemic to central Barbados; blind, burrows underground, eats termites/ants.
  - Pale yellow dorsal stripes, side-located eyes; often mistaken for larger flowerpot snake (no stripes).
  - Lays one slender egg, unlike most snakes.
  - Eat termites, blind
  - Due to their diet preferences, they are often found near ant and termite nests.
  - The pheromones these snakes produce protect them from attack by termites
- **Significance**:
  - Highlights value of persistent surveys and local knowledge.
  - Emphasizes conserving tiny, endemic species for ecosystem health.

Barbados

- **Greater Antilles**: A group of larger Caribbean islands including Cuba, Jamaica, Hispaniola (Haiti and Dominican Republic), and Puerto Rico, located in the northern Caribbean, known for their significant size and population.
- **Lesser Antilles**: A chain of smaller islands stretching from the Virgin Islands to Trinidad and Tobago, including Barbados, split into Leeward (e.g., Antigua) and Windward Islands (e.g., Grenada), marked by volcanic origins and diverse cultures.

33. Golden Jackal (Canis aureus)

Population and Research
• Estimated population of 20,000–30,000 Golden Jackals (Canis aureus naria) in Kerala, based on a citizen science study by Aranyakam Nature Foundation. • Study, led by P.S. Easa, S. Dhruvaraj, and Sandeep Das, involved 2,200+ participants and 5,000+ sightings across 874 villages.

Habitat Distribution
• Thrive in open lowlands below 200m, with only 2% sightings in protected forests; prefer coconut groves (24%), rural settlements (10%), paddy fields (8%), and rubber plantations (6%). • Common in Kannur, Kozhikode, Thrissur, Ernakulam, and Thiruvananthapuram; rare in Western Ghats, Alappuzha coast, and Attappadi, with isolated groups in Munnar and Eravikulam.

Adaptability
• Highly adaptable to human-altered landscapes, including urban areas (5.6%), showing resilience in peri-urban and coastal zones. • 74.7% of respondents view them as non-nuisance, valuing their pest control (e.g., rodents, wild boars).

Concerns and Threats
• Issues include poultry predation, rabies cases, and reliance on organic waste, raising health and ecological risks. • Emerging threat of hybridization with stray dogs, worsened by urban sprawl and habitat loss.

Scientific Classification
• Classified as Canis aureus, with the Indian subspecies known as Canis aureus naria.

Physical Characteristics
• A medium-sized canid, resembling a wolf, characterized by its golden-brown coat.

Behavioral Traits
• Monogamous, mating for life; constructs burrows or utilizes existing caves and rock crevices for shelter. • Activity Patterns: Nocturnal in human-dominated areas, but exhibits diurnal behavior in wild or remote landscapes.

Dietary Habits
• Omnivorous and opportunistic, feeding on fruits, insects, small mammals, birds, reptiles, carrion, and garbage.

Habitat Preferences
• Prefers lowland ecosystems such as valleys, riverbanks, canals, lakeshores, and coastal regions; also adapts to human-altered environments like coconut groves, peri-urban, and rural settlements, though rare in foothills and low mountains.

Ecological Role
• Plays a key role in maintaining ecosystem balance by controlling pest populations and scavenging.

Conservation Status
• Listed as Least Concern by IUCN, but local threats include habitat loss and human-wildlife conflict, relevant for India's biodiversity policies.

34. Dibru-Saikhowa National Park

What's Happening in Dibru-Saikhowa National Park?

- **Location & Status:** Island-like tract between the **Brahmaputra (N)** and **Dibru (S)** in Assam; **425 sq km**; **Biosphere Reserve (1997)**, **National Park (1999)**.
- **Ecosystem shift: Grasslands shrinking**; The park's grasslands, which are vital for its wildlife, are shrinking due to the growth of both native plants (like Bombax ceiba and Lagerstroemia speciosa, known locally as Simalu and Ajar) and invasive species (like Chromolaena odorata, Ageratum conyzoides, Parthenium hysterophorous, and Mikania micrantha).

- and **invasive weeds** alters habitat structure in this **only Indian habitat of feral horses**.

Key Findings from the Study

- **Study:** *Grasslands in Flux* (Earth journal); by **Bodoland University, ZSI, Pukyong National Univ., Women's College Tinsukia**.
- **Method: Satellite imagery + GIS** assessing **LULC (2000–2024)**.
- **Trajectory of change:**
  - **2000:** Grasslands **28.78%**; semi-evergreen forest **25.58%**.
  - **2013: Shrubland dominates** (≈ **81.31 sq km**); **degraded forest** rises to **75.56 sq km**; large swathes of grassland/forest/bare land → shrubland.
  - **2024: Degraded forest** expands to **80.52 sq km (23.47%)**; more shrubland & semi-evergreen forest convert to degraded forest.
- **Bottom line: Sustained grassland decline**, progressing to shrubland/degraded forest.

Why This Matters

- **Biodiversity risk:** Grassland specialists imperiled—**Bengal florican (CR)**, **hog deer**, **swamp grass babbler**, **~200 feral horses** (WWII lineage); plus tigers, leopards, elephants, **300+ bird spp.**
- **Climate angle: Degraded forests = lower carbon storage**, weakening sink potential.
- **Uniqueness:** Keystone of **Brahmaputra floodplain** biodiversity.

What's Causing the Problem?

- **Native woody spread: Bombax ceiba (Simalu)**, **Lagerstroemia speciosa (Ajar)** expand into grasslands.
- **Invasives: Parthenium hysterophorus**, **Mikania micrantha**, **Chromolaena odorata**, **Ageratum conyzoides** outcompete natives.
- **Hydro-geomorphic churn: Frequent floods** (siltation + erosion) reshape habitat.
- **Human pressure: Forest villages**—grazing, extraction intensify stress.

Solutions Suggested by the Study

1. **Grassland Recovery Project:** Active **restoration & controlled burning/cutting** where appropriate to check woody encroachment.
2. **Invasive control:** Systematic **removal/suppression** with monitoring.

3. **Surveillance & Staffing: More guards, monitoring**, early-warning for weed spread.
4. **Relocation of forest villages: Humane resettlement + co-management** with local communities.
5. **Data-led management:** Use **LULC evidence** to prioritize **critical grassland cores & corridors**.

Why This Is Important

- **Protects a biodiversity hotspot** (feral horses, Bengal florican, etc.).
- **Safeguards carbon sinks** in the floodplain mosaic.
- **Urgency: Immediate, targeted management** needed to arrest grassland loss.

National parks and Biosphere reserves in Assam

Category	Number	Key Examples (not exhaustive)	Notable Species / Highlights
National Parks	8	Kaziranga, Manas, Dibru-Saikhowa, Nameri, Orang, Dehing Patkai, Raimona, Sikhna Jwhwlao	One-horned rhino, Bengal tiger, golden langur, feral horses
Biosphere Reserves	2	Manas, Dibru-Saikhowa	Pygmy hog, Bengal florican, Gangetic dolphin
Tiger Reserves	4	Kaziranga, Manas, Nameri, Orang	Bengal tiger
Wildlife Sanctuaries	17 (+3 proposed)	Hollongapar Gibbon, Pobitora, Deepor Beel, Chakrashila, Barnadi	Hoolock gibbon, one-horned rhino, Bengal florican
Ramsar Sites (Wetlands)	1	Deepor Beel	Greater adjutant stork, white-winged wood duck

35. Gulf of Mannar

Context: In Tamil Nadu's Gulf of Mannar, coral bleaching has been addressed through artificial reef restoration using divers to place triangular and perforated trapezoidal concrete modules underwater.

- These frames have successfully supported diverse coral species, increasing coral cover, survival rates, and fish density, while mitigating bleaching effects and improving community awareness, capacity, and livelihoods.

Gulf of Mannar (GoM) – Key Facts
• **Location:** Part of the Laccadive Sea (Indian Ocean), between **southeast India (Tamil Nadu)** and **northwest Sri Lanka**; bounded by **Rameswaram, Adam's Bridge (Ram Setu), and Mannar Island**. • **Rivers: Tambraparni (India)** and **Malvathu Oya (Sri Lanka)** flow into the gulf. • **Features:** Hosts **Tuticorin Port**, pearl banks, and sacred chank (gastropod mollusk). • **Islands:** 21 small islands.

Marine Conservation

• **Gulf of Mannar Marine National Park (162.9 km²):** Established **1982** under Wildlife (Protection) Act, 1972.
  ○ Ecosystems: coral reefs, mangroves, seagrass, estuaries, mudflats, sandy shores.
  ○ Biodiversity: **117 coral species**, >450 fish species, threatened species like **dugong, whale shark, sea turtles**.
• **Gulf of Mannar Biosphere Reserve (10,500 km²):** Created **1989**, UNESCO recognition in **2001**.
  ○ First **Marine Biosphere Reserve in South & Southeast Asia**.

36. Saltwater Crocodile

- Recent survey by the West Bengal Forest Department shows a rise in the population of saltwater crocodiles in the **Sundarban Biosphere Reserve (SBR)**.

About

- The largest living reptile and apex predator in aquatic ecosystems.
- Known as a hypercarnivorous species, crucial for maintaining ecological balance by consuming carcasses and regulating prey populations.

Key Facts

- **Scientific Name**: *Crocodylus porosus*
- **Other Names**: Estuarine/Indo-Pacific/Marine crocodile; "Saltie".
- **Distribution**: East coast of India, Southeast Asia, Sundaic region, Northern Australia & Micronesia.
- **Habitat**: Saltwater habitats, brackish wetlands, estuaries, and coastal ecosystems.

Features

- **World's largest reptile**; apex predator.
- **Male**: ~5 m long, ~500 kg | **Female**: <3 m, <100 kg.
- Dark greenish-brown body with lighter underbelly (camouflage).
- Armored skin with tough scales; highly territorial and solitary (esp. males).

Conservation

- **IUCN Status**: *Least Concern*.
- Protected under **Schedule I of Wildlife (Protection) Act, 1972** in India.

Crocodiles in India

Overview

37. CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)

What is CITES?
• CITES is an international agreement among governments aiming to ensure that international trade in wild animals and plants does not threaten their survival. • It provides varying degrees of protection to more than 35,000 species.

How Does CITES Work?
• CITES regulates global trade in endangered species through a robust system of permits and certificates. • Every listed species is assigned to an appendix, defining the level of protection and regulation required. 

CITES Appendices
• **Appendix I:** Species most at risk of extinction. Trade is permitted only in exceptional circumstances (e.g., scientific research). • **Appendix II**: Species not immediately threatened with extinction, but trade needs to be strictly regulated to prevent future risk. • **Appendix III:** Species protected in at least one country, which seeks CITES' help to control trade. • Species may be moved between the appendices as threats change, based on periodic review and proposals at the Conference of Parties (CoP).

Enforcement
• CITES is legally binding, but implementation and enforcement depend on domestic laws (in India, the Wildlife Protection Act, Customs Act, etc.). • National agencies manage permitting and control illegal wildlife trade, supported by international cooperation.

38. ASIATIC LION

What is an Asiatic Lion?

- **Species:** *Asiatic lion (Panthera leo persica), a subspecies distinct from African lions (Panthera leo leo).*
- **Location:** Only wild population in **Gir landscape, Gujarat**.
- **Significance:** Conservation success; biodiversity symbol; on India's national emblem.

What is the Recent Population Census and Increase?

- **16th Census (May 2025): 891** lions.
- **Growth: +32.2%** from 674 (2020); **+172%** from 327 (2001).
- **Distribution: ~40%** outside sanctuaries → overcrowding & conflict risks.

What Methods are Used to Count Asiatic Lions?

- **Block count** across ~**35,000 km²** (11 districts), continuous **24-hr sightings**.
- **Tech:** camera traps (whisker/scar ID), **GPS/GIS**, radio collars; 2,500 personnel.
- **Notes:** Low error reported; calls to align fully with global photo-ID standards.

How Do Asiatic Lions Differ from African Lions?

- **Size:** Asiatic ♂ **160–190 kg**, ♀ **110–120 kg** (generally smaller).
- **Traits: Sparser mane**, characteristic **belly fold**.
- **Sociality:** Smaller prides (2–10); males often solitary.
- **Ecology:** Dry deciduous forests; nocturnal; deer/livestock prey.
- **Status:** Higher risk due to **single wild population**.

Who are the Maldhari Tribe and Their Role with Lions?

- ~**1,000** semi-nomadic pastoral families; cultural reverence (Narsimh avatar).
- Support conservation (reporting, deterrence, tourism); conflicts mitigated via **compensation** & **well barricading**

Gir National Park

- **Location:** Gir Somnath & Junagadh, Gujarat. **Established:** 1965.
- **Area: 1,412 km²** (core **259 km²**). **Biodiversity:** 40 mammals, 425 birds; teak forests.
- **Significance:** UNESCO-recognized; major eco-tourism site.

What is the Conservation Status of Lions?

- **Asiatic lion:** Legal—**WPA Schedule I**, **CITES App.**
  - Per text: moved on IUCN Red List from **Endangered (2008)** to **Vulnerable (2025)**; Green Status: "**Largely Depleted**", stable; current global lion range ~**6%** of historical.
- **African lion: Vulnerable**; some subpopulations **Critically Endangered**.

What are India's Conservation Efforts for Asiatic Lions?

- **Project Lion (2020): ₹2,927 cr** for habitat expansion, anti-poaching, disease control, reintroduction (Kuno plans delayed by cheetah project).

- **Community measures:** well safety, compensation, Maldhari partnership.
- **Monitoring:** GPS tracking, vet care, genetics to curb inbreeding.
- **Second population:** proposed in MP; **stalled** legally.

International Big Cat Alliance (IBCA)

- **Launched:** Feb 2023; **operational 2024**. **HQ pact:** Apr 17, 2025 (New Delhi).
- **Members: 11 countries** (July 2025; list provided); broader membership envisaged.
- **Funds: ₹150 cr** initial by India.
- **Scope:** 7 big cats—tiger, lion, leopard, jaguar, snow leopard, puma, cheetah; climate, knowledge, sustainable use.

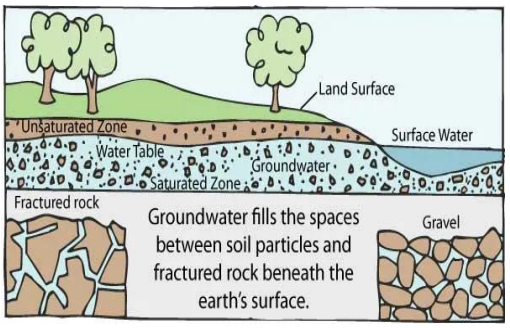
What are the Seven Big Cat Species and Those Found in India?

- **Seven:** Tiger, Lion, Leopard, Jaguar, Snow Leopard, Puma, Cheetah.
- **In India:** Tiger, Lion, Leopard, **Snow Leopard**, **Cheetah (reintroduced, Kuno)**; **Jaguar/Puma absent**.

39. GROUND WATER POLLUTION IN INDIA

Groundwater Pollution in India

- **Context/ Event:** Widespread quality + quantity crisis: geogenic (arsenic/fluoride/uranium/iron) + anthropogenic (nitrates, pathogens, heavy metals); over-extraction rising (21% blocks overexploited by 2023); coastal seawater intrusion emerging.



- **What it is (pathways):**
  Agricultural runoff (nitrates/phosphates; **~65% rural drinking water** affected by nitrate from return flows); **industrial effluents** (Cr, Pb; Punjab/Rajasthan clusters); **geogenic** leaching (arsenic—Bihar/WB; fluoride—Rajasthan granite; uranium/iron); **urban/municipal waste** (sewage, landfills, septic leaks; **Delhi: 40% samples** with nitrates); **mining drainage** (e.g., uranium—Jharkhand); **over-pumping & seawater intrusion** (coastal **Tamil Nadu**; deeper contaminants mobilised); **atmospheric deposition** (acid rain/airborne pollutants via recharge).

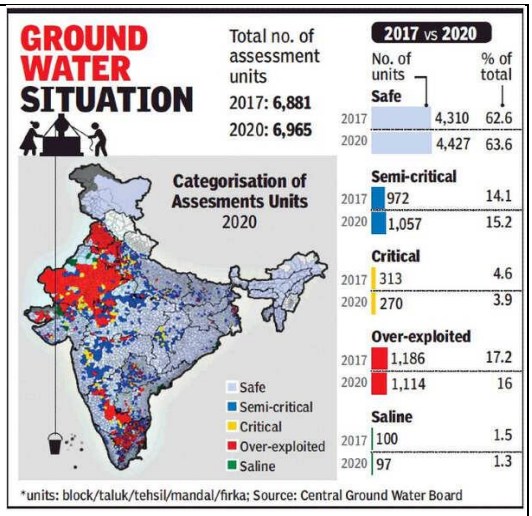
- **Why dangerous / why it matters:**
  Health: fluorosis, arsenicosis, methemoglobinemia ("blue baby"), renal/neurological toxicity, GI infections.
  Environment: soil infertility, aquifer biodiversity loss, eutrophication (nitrate → algal blooms).
  Economy: 10–25% yield drop in hotspots; higher treatment costs.
  Society: rural poor, women, children hit hardest; **>1,000 Rajasthan villages** face acute nitrate issues.

- **India's drivers:**
  1. **Climatic/Geological:** high-mineral rocks (Rajasthan) + low rainfall reduce dilution.
  2. **Geography/Hydrology: hard-rock aquifers (~65%)** low permeability; alluvial aquifers high storage but stressed; coastal cones invite saline ingress.
  3. **Human-induced/Policy:** fertiliser/pesticide overuse; untreated effluents; sewage/septic/landfill leakage; mining; **free power & tube-well push**.
  4. **Climate signal:** erratic rain/heatwaves alter recharge; floods disrupt quality.
  5. **Administrative:** fragmented monitoring (**CGWB ~20% samples regularly monitored**); enforcement gaps; legacy **Easement Act, 1882**.

The Quality–Quantity Case & Wider Context

- **Geogenic or anthropogenic? Both**—distinguish via source mapping, depth profiles, isotopes (e.g., $\delta^{15}N$ for nitrates).
- **Amplifier geographies/sectors:** Intensively irrigated **Ganga–Indus alluvium** (nitrates); **peninsular hard-rock belts** (low storage, fluoride/uranium pockets); **coastal TN/AP** (saline intrusion); **urban landfills/septic**; **dark blocks** (Punjab **172%**, Haryana **133%**, Rajasthan **137%**, Delhi **137%** utilisation).

- **Water as a resource (global): Saline 97.2%**; **freshwater 2.5%** → of this: **glaciers/ice caps 67%**, **groundwater 30.1%**, **surface/other 1.2%** → within surface/other: **ground ice/permafrost 69%**, **lakes 21%**, rest = soil moisture, swamps/marshes, rivers, biota.
  Main sources: surface, underground, atmospheric, oceanic (daily life: mainly surface + underground).
- **Water stress thresholds: <1,700 m³** (stress), **<1,000 m³** (scarcity), **<500 m³** (absolute scarcity) per person/year.
- **India's water endowment: 2.45%** world surface area; **4%** water resources; **16%** population. Annual precipitation **4,000 km³**. Surface water + replenishable groundwater **1,869 km³** (≈**60% usable**). **Total utilizable: 1,122 km³**. Per-capita: **5,178 kl (1951) → 1,651 kl (2011) → ~1,228 kl (2051 est.)**.



- **Groundwater distribution (India): Replenishable ~432 BCM**, available **~398 BCM** after **35 BCM** natural discharge (**CGWB 2024**).
  - **High availability: Ganga-Brahmaputra** and **coastal plains** (rain **1,500–3,000 mm**, flat porous alluvium).
  - **Low availability: Peninsular plateau**, **Himalaya**, **desert (Rajasthan <500 mm)**; depths **>10 m** common.
  - **Utilisation:** High >100% (Punjab, Haryana, Rajasthan, Delhi); Moderate 70–90% (Gujarat, UP, Bihar, Tripura, Maharashtra); Low <70% (Chhattisgarh, Odisha, Kerala).
  - **Hydro-settings: Hard-rock 65%** (low permeability, depletion-prone); **Alluvial** high storage but **~17% blocks over-exploited (CGWB 2023)**.
  - **Other data:** Per-capita **1,816 → 1,544 m³ (2001→2011)**; recharge sources **~68% rainfall**, **~32% canals/tanks/structures**.
- **Threats (NITI/Committees): Over-extraction: 17% blocks (2011) → 21% (2023)**; **1,071 dark blocks** across PB/HR/RJ/TN. **Contamination (CGWB 2024):** 60% districts—arsenic **68 districts/10 states**, fluoride **276/20**, nitrate **387/21**, iron **297/24**; plus bacteria/phosphates/heavy metals. **Habitat loss:** urbanisation (≈**50% urban water** from groundwater). **Climate change:** erratic rain/heatwaves; floods (e.g., **Uttarkashi, Aug 2025**); **241.34 BCM** extracted (2023). **Legal/policy:** Easement Act + subsidies drive overuse.
- **Reasons (depletion & pollution): Irrigation 89%** of groundwater (paddy/sugarcane); **tube wells 61.6%** of irrigation; **62% national extraction rate (2011)**; big-city risk; subsidised power (PB/HR) → **10–20 m** table fall in PB; **industrial/urban** loads (e.g., Cr—Kanpur; **~70 bn L/day** untreated wastewater); **fertiliser +16% (2015–21)** → nitrate leaching.
- **Risk-reduction playbook (institutions + measures):**
  Institutions: CGWA (EPA 1986 regulation), **CGWB** (aquifer mapping; **2020 Master Plan: 1.42 crore recharge structures**), **NAQUIM** (25 lakh sq km), **CPCB** (Water Act 1974 enforcement), **CWC** (resource coordination).
  Techniques: artificial recharge (check-dams, recharge wells), **percolation tanks**.
  Policies/Programs:
  - **Jal Shakti Abhiyan** (2019→Phase-5 "Catch the Rain" 2024);
  - **Atal Bhujal Yojana (2020, ₹6,000 cr, 80 districts/7 states)**;
  - **National Water Policy (2012)**;
  - **Plastic Waste Mgmt Rules 2016/2022** (biochar **15–26 MT/yr** potential);
  - **MGNREGS** (water structures);
  - **15th FC grants**;
  - **AMRUT 2.0** (stormwater, aquifers);

- **BWUE** (20 Oct **2022**);
- **Mission Amrit Sarovar (2022)** (75 per district); **PMKSY** & **WDC-PMKSY**;
- **National Water Awards** (since **2018**, 6th edn extended to **Jan 31, 2025**);
- **State guidelines** via **UBBL 2016**,

- **Model Bye-laws 2016**, **URDPFI 2014**.
  Community: awareness, village-level septic systems, waste management; promote organic farming; **ZLD/ETPs** for industries; real-time sensors; RO/bioremediation; rainwater harvesting.

40. What Are Contaminated Sites

Contaminated sites in India are areas where hazardous substances or wastes have been dumped, stored, or mishandled in the past, leading to pollution of soil, groundwater, surface water, or sediments. These sites pose serious risks to human health, ecosystems, and the environment. Examples include abandoned industrial zones, old landfills, areas with chemical spills, or outdated waste treatment facilities. Und
er the new Environment Protection (Management of Contaminated Sites) Rules, 2025, a site is officially labeled as contaminated after a detailed assessment confirms that contaminant levels exceed safe thresholds.

How Are Contaminated Sites Declared?

The process to declare a site contaminated follows a structured approach under the 2025 rules, overseen by the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs):

- **Identification**: Sites are pinpointed using historical records, public complaints, or environmental surveys, such as old landfills or industrial spill locations.
- **Preliminary Assessment**: Initial checks involve sampling and site inspections to identify potential contamination.
- **Detailed Site Investigation**: Thorough testing of soil, water, and air is conducted for 189 specified contaminants, including heavy metals and pesticides.
- **Risk Assessment**: Experts evaluate the health and environmental risks; if contaminant levels exceed standards, the site is marked as "probable" or "confirmed."
- **Declaration**: The SPCB (or CPCB for multi-state sites) formally declares it contaminated under Rule 4(9), notifies the public, restricts access, and plans remediation, following CPCB guidelines on sampling and lab analysis.

How Many Contaminated Sites Are There in India?

As of 2025, the CPCB has confirmed 103 contaminated sites across India, with 93 additional probable sites under investigation by SPCBs. Remediation has begun at only seven sites. Independent estimates, such as those from Pure Earth, suggest over 500 potentially contaminated locations, though official data focuses on verified cases. States like Tamil Nadu, Uttar Pradesh, and West Bengal report the highest numbers of affected sites.

New Laws of 2025 on Contaminated Sites

The Environment Protection (Management of Contaminated Sites) Rules, 2025, notified on July 24, 2025, under the Environment (Protection) Act, 1986, provide a legal framework to identify, assess, and clean up contaminated sites. Key aspects include:

- **Polluter Pays Principle**: Owners or polluters must fund assessments and cleanup; if they're untraceable, the government steps in.
- **Standards**: Specifies 189 contaminants with threshold limits tailored to land use (e.g., residential, industrial).
- **Penalties**: Violations can lead to fines up to ₹5 crore or imprisonment up to 5 years under the Environment (Protection) Act, with simpler offenses covered by the Bharatiya Nyaya Sanhita (2023).
- **Omission**: Lacks a fixed timeline for remediation after identification, creating a significant gap.

Exclusions

These rules do not cover:

- Radioactive waste (governed by Atomic Energy rules).
- Mining operations (under Mines and Minerals Act).
- Oil pollution in the sea (under Merchant Shipping Act and international conventions).
- Solid waste from dump sites (under Solid Waste Management Rules).

These exclusions avoid overlap with existing specialized regulations.

41. Intergovernmental Negotiating Committee (INC) on Plastic Pollution

What is the INC on Plastic Pollution?

- The Intergovernmental Negotiating Committee (INC) is a UNEP body tasked with creating a legally binding global treaty to combat plastic pollution, including marine environments.
- Established by UNEA resolution 5/14 (March 2022, Nairobi) to address the full plastic life cycle (production to disposal).
- Held five sessions: INC-1 (Uruguay, 2022), INC-2 (France, 2023), INC-3 (Kenya, 2023), INC-4 (Canada, 2024), INC-5 (South Korea, 2024); INC-5.2 set for August 5–14, 2025, in Geneva.

What are the Objectives of the INC?

- Develop a comprehensive treaty by end-2025 to:
  - Promote sustainable plastic production and consumption to reduce environmental, social, and economic impacts.
  - Protect ecosystems (oceans, rivers, biodiversity), human health, and vulnerable communities.
  - Foster international cooperation, including financial and technical support, for a circular plastic economy.

What are the Obstacles

- **Scope Disputes**: Divisions over including global plastic production limits (supported by 100+ countries like Panama, Rwanda) vs. focusing only on waste management, recycling (backed by oil-producing nations like Saudi Arabia, Iran, U.S.).
- **Mandatory vs. Voluntary**: No consensus on binding global rules (e.g., chemicals, production) vs. voluntary national measures; all treaty elements remain unresolved.
- **Funding Issues**: Developing nations demand a dedicated fund based on common but differentiated responsibilities; developed nations (EU, U.S., Japan) prefer existing mechanisms and private funding.
- **Consensus Requirement**: Unanimous agreement needed, causing delays; opt-in/opt-out or voting proposals rejected (e.g., by India, Saudi Arabia).
- **Transparency Concerns**: Limited participation of observers (Indigenous Peoples, civil society) in informal talks, reducing inclusivity on human rights and gender issues.

What are Pollution Control Boards in India?

- **Central Pollution Control Board (CPCB)**:
  - Established in September 1974 under the Water (Prevention and Control of Pollution) Act, 1974; powers expanded by the Air Act, 1981.
  - Operates under the Ministry of Environment, Forest and Climate Change (MoEFCC).
  - Functions: Promotes water and air quality, provides technical support, coordinates State Pollution Control Boards (SPCBs), compiles pollution data.
- **State Pollution Control Boards (SPCBs)**:
  - Formed by state governments under Water and Air Acts as statutory authorities.
  - Mandate: Enforce environmental laws, monitor pollution, grant industry consents (CTE/CTO), manage hazardous waste, e-waste, and solid waste (including plastics).
- **Pollution Control Committees (PCCs)**:
  - Operate in Union Territories, performing similar functions to SPCBs, enforcing pollution control measures.

42. Glacial Lake Outburst Floods (GLOFs)

Glacial Lake Outburst Floods (GLOFs) are sudden releases of water from glacial lakes, which can cause significant downstream flooding and damage. These lakes form due to melting glaciers and are typically dammed by weak materials such as loose rocks, ice, and debris. When these natural dams break, often due to triggers like earthquakes, landslides, avalanches, or excess water pressure, they release a powerful flood downstream.

In the Indian Himalayan Region (IHR), two prominent types of glacial lakes are identified: supraglacial lakes and moraine-dammed lakes. Supraglacial lakes form on glacier surfaces from meltwater and are prone to melting during summer. Moraine-dammed lakes, on the other hand, form at the snout of glaciers and are highly susceptible to sudden failure due to avalanches, landslides, meltwater pressure, or earthquakes

Causes

- **Climate Change**: Speeds up glacier melting and lake growth, with warmer temperatures making ice and moraine dams weaker.
- **Glacier Retreat/Surges**: Leaves hollows that fill with water or forms shaky temporary lakes.
- **Natural Triggers**: Landslides, avalanches, earthquakes, heavy rain, or permafrost melt can break fragile dams.
- **Human Factors**: Building projects, mining, or roads can disturb and destabilize the area.
- **Excess Water Pressure**: Too much meltwater or rain can overflow and burst weak barriers.

Impacts

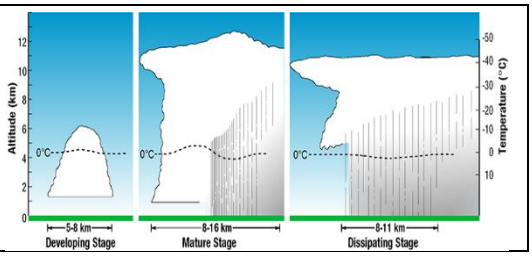
- **Human Loss**: Sudden floods lead to deaths and displacement, like Sikkim 2023 with over 100 killed.
- **Economic Damage**: Destroys key infrastructure such as hydropower plants, roads, and bridges, e.g., Sikkim's $2B Chungthang dam loss.
- **Livelihood Disruption**: Harms farming, tourism, and markets, pushing communities into long-term poverty.
- **Environmental Harm**: Causes river erosion, sediment buildup, and loss of wildlife over hundreds of kilometers.
- **Broader Effects**: Sparks famine-like conditions and health issues from polluted water.

Situation in India

- **High Risk**: Indian Himalayas host ~7,500 glacial lakes (part of 28,000 in IHR), with 195 at high GLOF risk due to rising warmth.
- **Recent Events**: Sikkim 2023 GLOF (South Lhonak Lake) killed over 100 and wrecked the Teesta dam; Kedarnath 2013 led to 5,000+ deaths.
- **Mitigation Efforts**: NDMA's $20M plan maps 195 lakes, sets up weather stations and early warning systems; 2024 expeditions checked 40 high-risk sites in J&K, Himachal, etc.
- **Vulnerabilities**: Hits hydropower, tourism, and livelihoods hard in Sikkim, Uttarakhand; 2023-24 warming has worsened the danger.

43. Thunderstorms

Thunderstorms are local storms characterized by swift upward air movement and heavy precipitation, including rainfall, hailstorms, and squalls, accompanied by thunder and lightning. They are considered a form of tertiary atmospheric circulation.



Formation of a Thunderstorm:

Three essential ingredients are required for a thunderstorm to form:

- **Moisture**
- **Rising Unstable Air**: Air that continues to rise when given a nudge.
- **Lifting Mechanism**: A force to provide the initial upward push.

Types of Thunderstorms:

- **Regular Thunderstorms**
- **Severe Thunderstorms**: Includes phenomena like cloudbursts and tornadoes.

Process of Formation:

Formation Process

- Sun heats Earth's surface → warms air rises (convection).
- Air cools as it rises → condensation forms clouds → grows into upper cold layers.
- Ice particles form → collisions generate electric charges → **lightning + thunder**

The Thunderstorm Life Cycle

Formation Process

Thunderstorms progress through three stages:

Developing Stage

- **Rising air creates towering cumulus clouds.**
- **Little/no rain; occasional lightning.**

Mature Stage

- **Updraft + precipitation = downdraft.**
- **Most intense phase: heavy rain, hail, lightning, strong winds, tornado risk.**

Dissipating Stage

- **Warm moist inflow cut off.**
- **Rain weakens but lightning danger remains**

In essence: Thunderstorms form when hot, moist air rises, cools, and condenses, leading to intense rain, winds, lightning, and hail. They pass through a clear 3-stage life cycle — build-up, peak intensity, and dissipation.

44. Cloudbursts

- As per the India Meteorological Department (IMD): Rainfall of 100 mm or more in an hour over a small area (20–30 sq. km).
- Extreme, localized events — often in mountainous terrain.

Formation of Cloudbursts:

- Strong updraft of hot air stops raindrops from falling.
- Raindrops rise, grow larger, and accumulate.
- When the updraft weakens, massive water is suddenly released → torrential rainfall.
- Linked to **thunderstorms, orographic lift, and convective activity**

Notable Cloudbursts:

- **Himachal Pradesh (2003)**
- **Ladakh (2010)**
- **Uttarakhand (2013)**
- **Recent Incidents (2022)**: Reported in the northeastern states and Western Ghats during the current monsoon season.

Causes of Cloudbursts

Causes of Cloudbursts

Meteorological

- Orographic lift (air forced over mountains).
- Convective heating (rapid upward moist air).
- Atmospheric instability.

Geographical

- Mountain terrain (steep slopes).
- Wind funneling moist air into confined zones.

Effects of Cloudbursts

- **Flash Floods – sudden deluge destroys infrastructure/agriculture.**
- **Landslides – slope destabilisation blocks roads/rivers.**
- **Loss of Life/Property – rapid onset, no time for warning.**
- **Service Disruption – transport, communication, rescue hampered.**

Management and Preparedness Strategies

Early Warning

- **Weather radars, real-time monitoring in hotspots.**

Infrastructure Planning

- **Flood control (levees, drainage), slope stabilisation.**

Community Preparedness

- **Public awareness, evacuation drills in prone areas.**

Policy Support

- **NDMA guidelines + Sendai Framework (2015–2030) stress multi-hazard disaster management.**

In essence: Cloudbursts are sudden, intense rain events mainly in mountains, causing flash floods and landslides. Prediction is tough due to their localized nature, so preparedness, resilient infrastructure, and early warning are the best safeguards

45. UTTATKASHI FLASH FLOODS

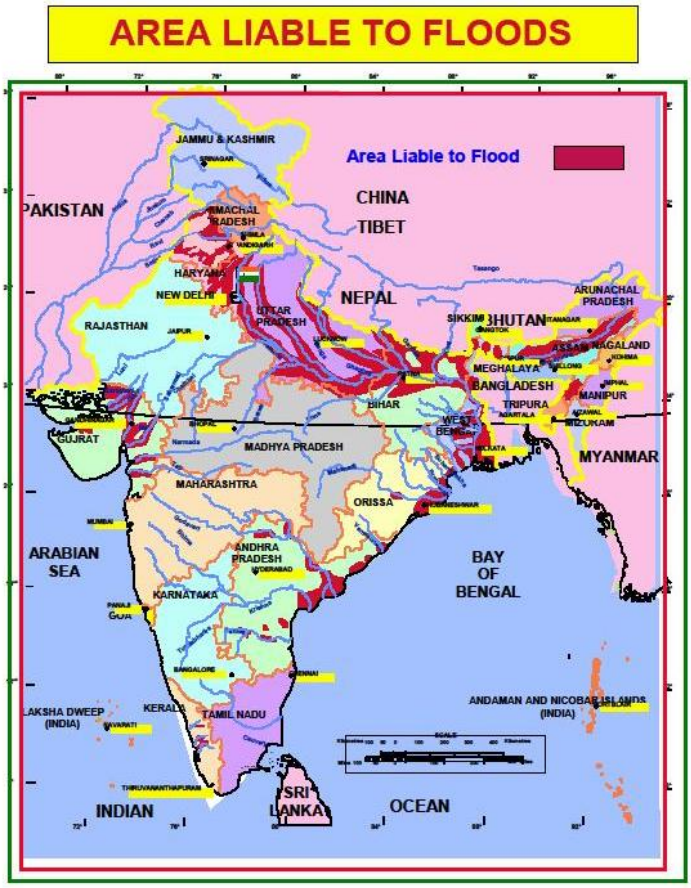
Uttarkashi Flash Floods (Aug 5, 2025):

- Sudden flash floods and mudslides hit Dharali, Uttarkashi (Uttarakhand). At least 4 deaths, 60+ missing (incl. ~10 soldiers); 40–50 houses and 20+ hotels/shops swept away. ISRO–NRSC ran a rapid damage assessment using Cartosat-2S very-high-resolution imagery.
- **What are Flash floods?:** Flooding that begins within ≤6 hours (often ≤3 hours) of a trigger. **Triggers:** extremely heavy convective rain; dam/levee failure; debris flows/mudslides.
- **Why are Flash floods dangerous:** Speed + surprise. Fast, high water columns threaten travellers; rapid rise traps people in homes/shops with little prep time.

Causes of Flash floods in India

1. Climatic/meteorological:

- **Monsoon dominance:** ~80% of annual rain in Jun–Sep; intense short bursts can flash-flood.
- **Cloudbursts:** ≥100 mm/hour over ~10×10 km cells → sudden surges (often Himalayan).
- **Cyclones/circulations:** Eastern/coastal belts get extreme downpours and surges.



2. Geography/hydrology:

- **River capacity + sediment:** Ganga–Brahmaputra systems carry heavy silt; channels overtop.
- **Erosion & unstable banks** amplify risk; transboundary flows complicate control.
- **Topography:** Steep Himalayan slopes + narrow valleys accelerate runoff; debris slides intensify impact.

3. Human-induced:

- Unplanned urbanisation/floodplain encroachment (NDMA flagged) reduces drainage.
- Deforestation, mining, linear infrastructure disturb catchments, raise sediment loads.
- Settlements in risk zones expand with population pressure.

4. Climate signal:

- Warmer air holds more moisture → more intense rain; rising losses (avg annual flood damage rose from ₹1,805 cr in 1953–96 to ₹4,745 cr in 1996–2005).

5. Administrative:

- **Early-warning and preparedness gaps**; data ambiguities delay response; new hotspots outpace old risk maps.

The Uttarkashi Case & Himalayan Context

- **Was it a cloudburst?** IMD defines cloudburst as ≥100 mm in 1 hr over **~10×10 km.** On Aug 5, station data for Uttarkashi showed very low 24-hr totals (e.g., ~2.7 mm); heavier rain was recorded downstream (e.g., Haridwar ~300 mm/24 hr). Conclusion: flash floods without a recorded cloudburst at local stations—likely due to prior multi-day rain + high-elevation concentrated precipitation and debris-laden flows.
- **Local amplifiers in Uttarkashi:**
  - **Relief:** 800–6,900 m elevation range; steep ridges, deep gorges, narrow valleys funnel flows.
  - **Geology:** Loose moraine/unconsolidated sediments mobilise easily, feeding debris torrents.
  - **Land use:** Commercial encroachments and build-up on vulnerable banks reduce conveyance.
- **Why Himalayas see more such disasters:**
  - Young, tectonically active mountains (uplift ~mm/yr) → fragile slopes.
  - **Orographic lift + western disturbances** produce intense, focused precipitation.
  - **Glacier dynamics:** GLOF risk from numerous small lakes; meltwater and ice calving can trigger floods even without local rain.
  - Close isohyets >100 mm in storm episodes concentrate rainfall.

Risk-reduction playbook (exam-oriented):

1. **Detect & warn:** Densify IMD and river gauges; integrate NRSC near-real-time mapping; last-mile alerts.
2. **Plan the basin:** Floodplain zoning; keep concave (outer) bend**s** free (erosion zone); preserve wetlands.
3. **Stabilise slopes:** Check-dams, bio-engineering, debris-flow barriers at chute points.
4. **GLOF management:** Inventory and rank lakes; remote-sensing watch; controlled breaching where necessary.
5. **Build right:** Raised plinths, stilted public buildings, permeable streets ("sponge city" features).
6. **Governance:** NDMA-SDMA-ULB protocols; dam-operator coordination; mock drills; transparent data sharing.

46. India Faces 50% Trump Tariffs

The US has imposed a 50% tariff on Indian exports ($86.5 bn) as a penalty for India's Russian oil imports, risking a 0.2–0.4% GDP slowdown. Labour-intensive sectors like textiles and gems are hit, while pharma and electronics are spared. India terms the move "unfair," stressing energy security. With a 20-day window until Aug 27, 2025, India must choose between diplomatic negotiations, diversifying trade and energy sources, or facing a trade war, while resisting US pressure on agriculture and dairy.

Tariff Details

- On Aug 6, 2025, President Trump signed an order imposing an additional 25% tariff on Indian imports, doubling the existing rate to 50%.
- Timeline: First 25% effective Aug 7, second 25% by Aug 27.
- Reason: India's continued Russian oil imports, under Executive Order 14066 linked to Ukraine war.
- Impact: About 55% of Indian exports to the US hit

Why Trump Is Upset

- Push to **boost US oil/LNG exports** to India.
- Strong backing from **US fossil fuel companies** that fund his campaign.
- India's US crude imports already up **50% in early 2025**.
- Tariffs seen as **leverage** to shift India away from Russian oil, not just punishment.

Indian Response

- **MEA** called tariffs "unfair" and highlighted India's **energy security needs** for 1.4 billion people.
- **FIEO** warned of a **30–35% disadvantage** for Indian exporters.
- **Opposition** termed it "economic blackmail."
- India countered US hypocrisy by pointing out **US imports of Russian uranium, palladium, fertilizers**

Economic and Diplomatic Context

- US-India **Bilateral Trade Agreement talks** set for Aug 25, 2025. Experts suggest **avoid retaliation**, focus on diplomacy.
- India is the **2nd-largest buyer of Russian oil** (after China), rising from <1% to ~40% since 2022.
- **RBI** said GDP remains strong (**6.5% growth**) and tariff war unlikely to fuel inflation

Geopolitical Developments

- **NSA Ajit Doval's Moscow Visit**:
  - **NSA Ajit Doval** in Moscow to discuss oil supplies, pending **S-400 deliveries**, and Russia's recognition of Taliban.
  - Russia backed India's independent trade choices, accusing US of **illegal pressure**.

India's Options

- **Diplomatic talks** – use Aug 25 meeting to negotiate, protect agriculture/dairy.
- **Diversify energy & exports** – more Middle East oil; shift exports to **Europe/ASEAN**.
- **Support exporters** – expand credit, promotion programs.
- **Strategic realignment** – recalibrate Russia ties, or deepen coordination with others (SCO, RIC format)

47. RBI Policy Decision

- **Repo Rate**: Unchanged at 5.5%, with a neutral monetary stance.
- **Reason**: Uncertainties from U.S. tariffs on Indian exports and volatile food prices.

Inflation Outlook:

- FY26 (current year): Lowered to 3.1% (down 60 basis points), below RBI's 4% target.
- Q1 FY27 (April-June 2026): Projected at 4.9%.

GDP Growth Forecast:

- FY26: Unchanged at 6.5%.
- Q1 FY27: Projected at 6.6%.

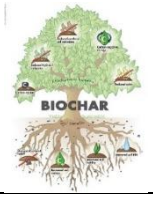
Growth:

- Domestic growth robust but below aspirations.
- Rural consumption strong, urban discretionary spending weak, government investment supports activity.
- Mixed signals from May-June high-frequency indicators.

- **U.S. Tariffs**: Global uncertainties, including U.S. tariffs and geopolitical tensions, pose risks to growth and external demand.
- **Liquidity**: RBI will ensure sufficient liquidity for economic needs and smooth market transmission.

48. What is Biochar?

Biochar is a carbon-rich material made by heating biomass in low oxygen. It locks away CO_2 for centuries, improves soil fertility, and reduces harmful emissions. In India, it provides a sustainable way to manage 600+ million tonnes of agricultural waste and 60 million tonnes of municipal waste annually, preventing stubble burning and landfill gases like methane and nitrous oxide.



How is Biochar Made?

- **reduced by pyrolysis:** heating crop residues, wood, or waste at 300–700°C without oxygen.
- **Yields:** 20–50% solid biochar, plus syngas (power) and bio-oil (fuel).
- **India's potential:** 15–26 million tonnes of biochar annually from surplus waste.

How is Biochar Made?

Benefits and Potential of Biochar

Biochar has multisectoral benefits, particularly in carbon removal, agriculture, energy, construction, and wastewater treatment.

Potential:

- **Climate & Carbon:** Locks carbon for 100–1,000 yrs, cuts CH_4/N_2O by 30–50%, removes 0.1 GT CO_2/yr in India.
- **Agriculture:** Boosts soil fertility & water retention, raises yields 10–25%, reduces fertilizer use 10–20%.
- **Waste & Energy:** Converts agri/municipal waste, avoids stubble burning; syngas & bio-oil replace coal/diesel, cutting ~2% fossil emissions.
- **Construction:** Mixed in concrete, adds strength & captures 115 kg CO_2/m^3.
- **Water Treatment**: 1 kg cleans 200–500 L wastewater; demand 2.5–6.3 MT.
- **Social Impact:** Creates 5.2 lakh rural jobs + farmer income via carbon credits (from 2026).

How Biochar Differs from Other Carbon Removal Methods

- Vs. Charcoal: Biochar is porous, long-term, soil-focused.
- Vs. Trees: Faster, uses waste; no need for large land.
- Vs. Direct Air Capture: Cheaper, decentralized, with useful byproducts

Measures Needed for Large-Scale Adoption

- **R&D** for region-specific feedstock and efficiency.
- **Policy integration** with waste, bioenergy, and climate schemes.
- **Carbon market inclusion** for income via credits.
- **Village-level units** for jobs + inclusive growth.
- **Cross-sector coordination** (agriculture, energy, urban bodies).

"What is the use of biochar in farming?

1. Biochar can be used as a part of the growing medium in vertical farming.
2. When biochar is a part of the growing medium, it promotes the growth of nitrogen-fixing microbes and promotes plant growth.
3. Biochar can be used to sequester carbon from the atmosphere.

Select the correct answer:

(a) 1 only (b) 2 and 3 only (c) 1 and 2 only (d) 1, 2, and 3"

49. Coconut Oil Prices: Impact on Kerala's Ayurvedic Industry

What is the Issue?

- **Price Surge**: Coconut oil prices in Kerala soared to ₹450/litre in 2025, up from ₹160 in 2024, ₹138 in 2023, ₹150 in 2022, ₹185 in 2021, and ₹166 in 2020.
- **Impact on Ayurveda**: The ₹4,000-crore Ayurveda industry, with 800 manufacturers, faces high production costs despite 10-20% price hikes for products.

Why is Coconut Oil Critical?

- **Usage**: Requires 12,000 tonnes annually for products like Murivenna (joint pain oil) and Dhurdurapathradi Velichenna (dandruff treatment).
- **Example**: 450 ml of Murivenna costs ₹430, with ₹225 for coconut oil alone, plus herbs, manufacturing, packaging, and marketing costs.
- **Historical Shift**: Replaced sesame oil decades ago to support Kerala's coconut growers and align with local practices.

Significance of Coconut Oil

- **Economic Contribution**: Coconut oil is a key ingredient in cooking, cosmetics, pharmaceuticals (e.g., Kerala's ₹4,000-crore Ayurveda industry), and industrial products, contributing significantly to India's GDP (₹30,795.6 crore in FY23).
- **Livelihoods**: Supports over 12 million people in India through farming, processing, and coir industries, employing nearly 6 lakh in 15,000 coir-based units.
- **Cultural Importance**: Integral to South Indian cuisine, Ayurvedic medicine, and rituals, with Kerala's industry facing challenges due to price surges.
- **Export Potential**: India exports coconut oil to 140+ countries, valued at ₹3,554.23 crore in FY23, with major markets like Vietnam and UAE.
- **Significance**: These countries produce 72% of global copra, driving the $5.49 billion coconut oil market (2025, projected to reach $7.61 billion by 2029).
  - **Climate Impact**: Heatwaves (March–June 2024) and irregular monsoons reduced coconut production in Kerala, Tamil Nadu, Karnataka (92% of India's output), causing crop wilting and lower quality.
  - **El Niño (2023–24)**: Affected yields in Indonesia and Philippines, tightening global supply (3.56 million metric tonnes in 2025, up from 3.50 in 2024).

50. Black money

Context

Income Tax Department detected ₹30,444 crore in undisclosed income (2024–25) through 465 surveys.
Black money = funds earned through illegal/hidden activities not reported for tax purposeseconomic, social, and political implications.

Illeagal and hidden activities

- **Illegal Activities**: E.g., smuggling, corruption (not reported to avoid taxes).
- **Legal but Unreported Activities**: E.g., cash payments (40% of a land sale in cash not reported) or small shops operating without receipts.

- **Sources**: Real estate, mining, pharmaceuticals, pan masala, tobacco, bullion, film industry, education, and shell companies abroad

Why is it Difficult to Quantify?

- Hidden by design.
- No standard methodology; estimates range **7–120% of GDP**.
- High in cash-heavy sectors like real estate

Methods to Measure Black Money

- **Monetary** – track abnormal money flows.
- **Global Indicator** – compare GDP with proxies like freight.
- **Survey** – voluntary disclosures (often unreliable).

Factors Leading to Black Money Generation in India

- **Illegal activities** – crime, corruption.
- **Legal but hidden** – under-reporting sales, factory output.
- **Other factors** – high taxes, complex compliance, weak enforcement, social tolerance of tax evasion

Impact of Black Money

- Economic: Loss of revenue, inflation, parallel economy.
- Social & Political: Funds crime & terrorism, widens inequality, erodes trust in institutions.
- International: Hurts reputation, enables cross-border crime.

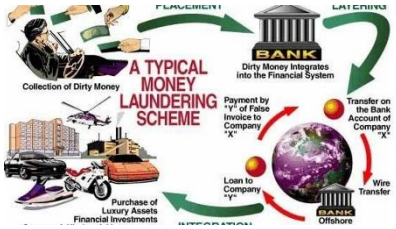
Government Initiatives to Combat Black Money

- Legislative:
- PMLA 2002, Benami Act 1988, Black Money Act 2015, Fugitive Offenders Act.
- Tax Reforms: GST, PAN mandate (>₹2.5 lakh), cash ban (>₹2 lakh), disclosure schemes.
- Digital Push: Cashless economy, e-audits, big-data analytics.
- Electoral Reforms: Electoral bonds, stricter reporting.
- International Cooperation: DTAA, FATF, AEOI with Switzerland & others.
- Enforcement: ED, FIU, SIT on black money.

Black money undermines India's economy, fuels inequality, and weakens governance. India has taken legislative, technological, and global cooperation steps, but challenges remain in enforcement and social attitudes.

51. Money laundering

According to the International Monetary Fund (IMF), money laundering is the **"transferring of illegally obtained money or investments through an outside party to conceal the true source."** Interpol defines it as any act to conceal or disguise the identity of illegally obtained proceeds so that they appear to have originated from legitimate sources.



- **Stages**:
  1. **Placement** – introducing illicit funds (e.g., deposits, smurfing).
  2. **Layering** – complex transactions to hide source.
  3. **Integration** – reintroducing as "clean" money (real estate, businesses).
- **Channels**: Banks, shell companies, real estate, luxury assets, currency exchanges.
- **Threats**: Funds terrorism, organized crime, corruption; undermines economic stability.

Institutional Measures
• **Agencies**: Enforcement Directorate (ED), Financial Intelligence Unit (FIU-IND), CBDT, SIT, RBI, SEBI. • **Financial Measures**: KYC norms, Aadhaar e-KYC, suspicious transaction reporting, demonetisation (2016), GST (2017), RBI's AML crypto guidelines.

Prevention of Money Laundering Act, 2002 (PMLA)
Objective: Prevent laundering, confiscate illicit assets, strengthen financial integrity. **Scope**: Aligns with FATF (Financial Action Task Force) & UN conventions. **Key Provisions**: • Section 3: Covers concealment/possession/use of "proceeds of crime." • Penalty: 3–7 yrs imprisonment (up to 10 yrs for NDPS Act offences) + unlimited fines. • Asset attachment/confiscation; mandates financial institutions to report suspicious activity

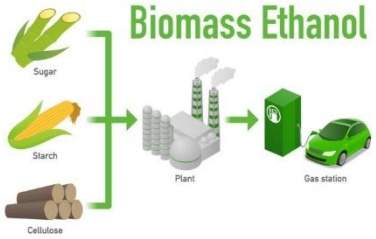
Significance of the Prevention of Money Laundering Act, 2002 (PMLA)
• Strengthens fight against corruption, drugs, terror financing. • Boosts financial transparency & global credibility (AEOI agreements). • Enabled seizure of ₹2,504 crore assets (FY25) and detection of ₹30,444 crore undisclosed income.

Criticisms of the Prevention of Money Laundering Act, 2002 (PMLA)
• **Reversal of burden of proof (Sec 24)** – undermines "innocent until proven guilty." • **Stringent bail norms (Sec 45)** – near-impossible conditions. • **Low Convictions** – <1% (2015–2025). • **Overreach** – broad definition of proceeds, risk of misuse against political dissent. • **Transparency Issues** – non-disclosure of ECIR despite SC concerns **In essence**: Thunderstorms form when hot, moist air rises, cools, and condenses, leading to intense rain, winds, lightning, and hail. They pass through a clear 3-stage life cycle : build-up, peak intensity, and dissipation

52. India's E20 Ethanol Blending Program

Ethanol Blending in India: Policy, Benefits, and Challenges

The Government of India plans to release guidelines for **27% ethanol blending in petrol** by August 2025. India already achieved **20% blending (E20)** nationwide in March 2025, ahead of the 2030 target. This places India alongside **Brazil (E27)** and strengthens its global leadership in biofuels.



Policy Framework

- **National Policy on Biofuels, 2018**: Promotes ethanol, biodiesel, methanol to cut oil imports, emissions, and boost farmer incomes.
- **Ethanol Blended Petrol Roadmap, 2021**: Advanced E20 deadline to 2025.
- **Recent Amendments (2022)**: Expanded feedstocks (maize, broken rice), mandated **flex-fuel vehicles (FFVs)** from 2026, and allocated ₹30,000 crore for ethanol/methanol plants.

What is Ethanol-Blended Fuel (EBF)?

- **Definition**: Petrol mixed with ethanol from crops, waste, or residues.
- **Common blends**: E10, E20; higher blends like E85 used in FFVs.
- **Advantages**:
  - Cuts GHG emissions by **20–30%**.
  - Reduces crude import dependence, saving **$10–17 bn annually**.
  - Improves octane value for engines.

Objectives and Benefits

- **Energy Security**: Over 80% crude is imported; blending saved **₹1.4 lakh crore since 2014**.
- **Farmers & Rural Economy**: Uses surplus crops (sugarcane, maize, FCI rice), ensuring price stability and income.
- **Environmental Gains**: Cuts **10–15% GHG**, improves urban air quality, supports net-zero by 2070.
- **Economic Growth**: 38 new distilleries, jobs in farming and bio-refineries; potential ethanol exports.

Feedstocks & Sustainability

- **Maize**: 40–50% less water vs sugarcane, suitable for rain-fed areas.
- **Damaged foodgrains from FCI**: Prevents wastage without straining food supply.
- **Agri-waste (2G ethanol)**: Minimizes water/land stress, avoids food vs fuel conflict.

53. Methanol Economy in India

Methanol-Based Fuel and Methanol Economy in India

What is Methanol-Based Fuel?

- **Methanol (CH_3OH)**: Light, volatile, flammable alcohol derived from coal, natural gas, or renewable biomass (agri-residues, municipal waste).
- **Blends**: Petrol blends like **M15 (15% methanol)**; can also be used directly in vehicles, DG sets, stoves, shipping, and power.
- **Properties**: High octane (108–110), emits ~40% less CO_2 than petrol, cheaper (₹20–30/l vs. ₹100/l petrol), but **highly toxic** if ingested.
- **Biofuel Status**: Biomass/CO_2-based methanol qualifies as **2G biofuel**.

Production of Methanol

- **Process**: Feedstock → syngas (CO + H_2) → catalytic conversion → purification.
- **Feedstocks**:
  - Fossil: coal (abundant in India), natural gas.
  - Renewable: agri-waste (rice straw, bagasse), MSW, CO_2 capture → "green methanol."
- **India's Focus**: Coal-to-methanol plants (e.g., Namrup, Assam); biomass-based R&D underway.

Methanol Economy (NITI Aayog Vision)

- **Concept**: Use coal, residues, CO_2, and natural gas to produce methanol as a **low-carbon, hydrogen-carrier fuel**.
- **Applications**:
  - **Transport**: M15–M100 in road, rail, and shipping.
  - **Energy**: DG sets, boilers, tractors.
  - **Cooking**: Methanol stoves replacing LPG/wood.
  - **Industry**: Feedstock for formaldehyde, acetic acid, paints.

Significance for India

Significance for India

- **Economic**:
  - Cuts **$15–20 bn fuel import bill**.
  - Generates ~**5 million jobs** in plants, logistics, and applications.
  - Promotes industries (paints, plastics, adhesives).
- **Environmental**:
  - Reduces GHGs, NOx, SOx, PM by ~20%.
  - Uses **600 MT agri-waste** and **60 MT MSW**, reducing stubble burning and landfill stress.
- **Social**:
  - **Methanol stoves** lower cooking cost by ~20%.
  - Rural LPG dependency reduced; cleaner air in urban/rural settings.
- **Regional**:
  - Coal-based methanol plants boost economies of Jharkhand, Odisha, Assam.
  - Uses **600 MT agri-waste** and **60 MT MSW**, reducing stubble burning and landfill stress.
- **Social**:
  - **Methanol stoves** lower cooking cost by ~20%.
  - Rural LPG dependency reduced; cleaner air in urban/rural settings.
- **Regional**:
  - Coal-based methanol plants boost economies of Jharkhand, Odisha, Assam.

54. National Green Hydrogen Mission

National Green Hydrogen Mission (NGHM)

India launched the **National Green Hydrogen Mission (2023)** under the Ministry of New & Renewable Energy (MNRE) with an outlay of **₹19,744 crore (2023–30)**. The Mission seeks to make India a **global hub for green hydrogen production, use, and export**, reducing fossil fuel dependence, fostering domestic manufacturing, attracting investment, and generating jobs, thereby advancing *Atmanirbhar Bharat* and net-zero targets.

Types of Hydrogen (by Production)

- **Grey**: From coal gasification/steam methane reformation; highly carbon-intensive.
- **Blue**: Grey methods + carbon capture, use, storage (CCUS).
- **Green**: Electrolysis of water using renewable electricity (solar, wind, hydro); zero-emission if powered by clean energy.

Role in Fertilizer Production

- **Ammonia (NH_3)**, made via Haber-Bosch, requires hydrogen.
- **Urea**: Needs 570 kg ammonia + CO_2/tonne. Grey hydrogen supplies in-situ CO_2; green hydrogen requires external sourcing.
- **Non-Urea Fertilizers** (DAP, ammonium sulphate): Need 220 kg ammonia/tonne; easier to switch to green ammonia.

Challenges

1. **High Costs**: Current ~$30/kg (California, 2023) vs. $3–6.5/kg competitiveness target.
2. **Infra Costs**: Hydrogen refueling stations costlier than EV charging.
3. **Storage/Transport**: Needs high-pressure, costly carbon-fiber tanks.
4. **Market Readiness**: Limited hydrogen vehicle adoption; closures of H_2 stations in California show market risks.
5. **Safety**: Flammable gas demands stringent standards and protocols.
6. **Competition with Batteries**: Advances in EV batteries may undercut hydrogen demand in transport.
7. **Regulatory Gaps**: Specialized hydrogen codes needed for storage/transport.

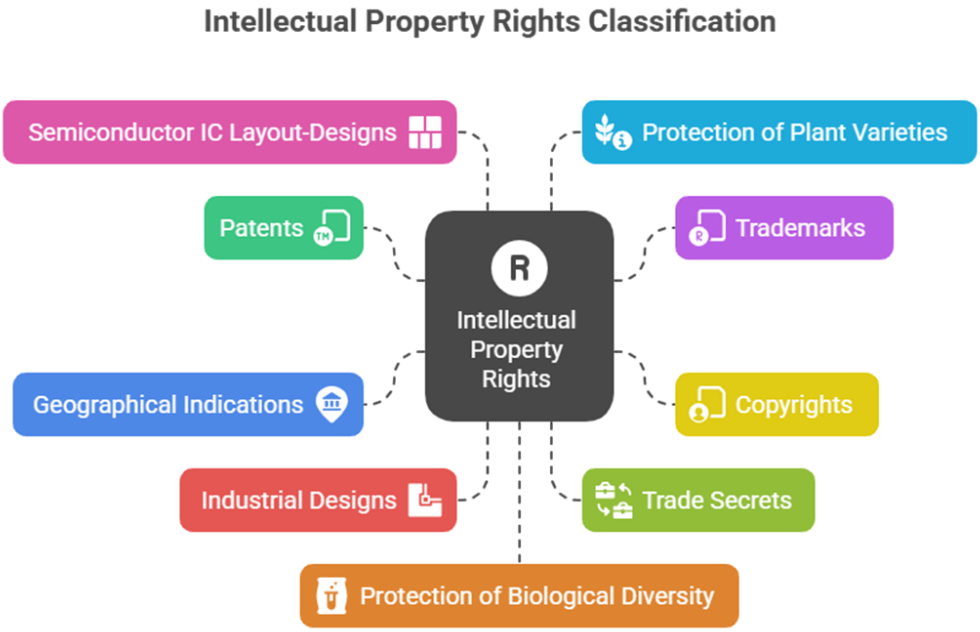
Conclusion

The NGHM is central to India's **energy transition, fertilizer security, and industrial decarbonization**. It combines environmental sustainability with economic growth and energy independence. However, **cost, infra, safety, and technology barriers** must be overcome through scale, R&D, and global cooperation.

55. Intellectual Property Rights (IPR)

- **Meaning:** Time-bound, exclusive legal rights to creators/inventors over their intellectual creations (arts, science, literature, tech).
- **Basis:** the Universal Declaration of Human Rights **(UDHR) Art. 27** protects moral & material interests arising from authorship.
- **Global anchor: World Intellectual Property Organisation (WIPO)** stewards multilateral IP architecture and 1st historic treaties (**Paris Convention for the Protection of Industrial Property (1883) and the Berne Convention for the Protection of Literary and Artistic Works (1886)**).

Intellectual Property Rights Classification

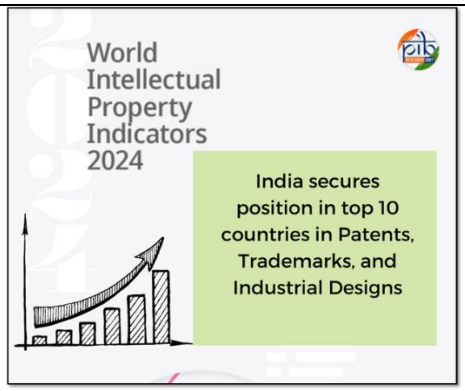


- **Patents:** Exclusive use/sale; criteria—**novelty**, **inventive step**, **industrial applicability**; **20 years** protection.
- **Trademarks:** Distinctive marks/logos/slogans; consumer source-ID; **10-year blocks, indefinite renewal**.
- **Copyrights:** Literary, artistic, musical, films, software; control over use/distribution; **life + term** (often **50y** globally; **India: life + 60y**).
- **Geographical Indications (GIs):** Origin-linked qualities/reputation; renewals typically **10-year blocks**.
- **Industrial Designs:** Shape/configuration/pattern/colour (non-functional aesthetics); **up to 15 years**.
- **Trade Secrets:** Confidential business info/processes; **no registration**, protection **indefinite** if secrecy maintained.
- **Semiconductor IC Layout-Designs:** 3-D chip layouts; **~10 years** from filing/first commercial use.
- **Protection of Plant Varieties:** Breeders' rights for **new/distinct** varieties; **~15–25 years**.
- **Protection of Biological Diversity:** TK/benefit sharing on genetic resources; terms via **environmental/ABS laws**.

Importance of IPR
• **Innovation engine** & **economic growth**;
• **Cultural enrichment** & **consumer protection** (TM/GI);
• **Global trade integration** across sectors.

Progress in India's IPR Ecosystem

- **Patent-to-GDP ratio: 144 → 381 (2013→2023)**.
- **Applications: 42,951 (2013-14) → 92,168 (2023-24)**.
- **Grants: 1.03 lakh (2023-24)** (backlog clearance).
- **Resident share: 56%** (up from **25.5%** in 2013-14).
- **Academia push: ~43%** institutional share (IIT-M 300 in 2023; IIT-B 421 in 2023-24).
- **Indian-origin filings: 57% (2023)**, crossing foreign filings; India cited as **#2 granted patents recipient (2021)**.



Industrial Design Applications

- **+36.4% (2023)**; strong in **Textiles/Tools/Health/Cosmetics**.

Trademark Rankings

- **Global #4** with **~4.8 lakh filings (2023-24)**; **90%** resident filings; top classes: **Health (21.9%)**, **Agriculture (15.3%)**, **Clothing (12.8%)**.

Staff and Processing Capacity

- Patent office staff **272 → 956** (+250%); **553** examiners added, **+525** planned.
- **Trademark Registry** to **double staff by 2026**; capacity target **2 lakh patents/yr**.

Challenges in India's IPR Ecosystem

- **Low GERD: 0.65% of GDP**; private share **36%** (vs 70%+ in US/China).
- **Pendencies: ~80%** recent patent apps awaiting decision; potential **grant dip** to **~45k (2024-25)**.
- **Stagnant TMs: 2.5–3 lakh/yr**;
- **Lengthy processing**, **complex procedures**, **weak enforcement** (Special 301 notes).
- **IPAB abolition (2021)** → burden on HCs; **corporate R&D inertia**.

Legal Framework

- **Patents Act, 1970**; **Designs Act, 2000**; **Trade Marks Act, 1999**; **GI Act, 1999** — administered by **CGPDTM**.

Measures Taken to Strengthen India's IPR Ecosystem

- **National IPR Policy (2016)**; **AIM (2016)**; **KAPILA (2020)**.
- **Patent Rules:** expedited exams for **startups/MSMEs/women**; **80% fee cuts** for edu/MSMEs/startups; full **e-filing**.
- **Institutional:** Staff ramp-up; **Trademark Registry** expansion; **2 lakh** patent capacity.
- **University IP Cells**; **innovation awards**.

56. India's IPR Policy 2016

Unifies all IPRs under one framework; builds institutions and processes to create, protect, commercialise, enforce and skill-up India's IP ecosystem—adapting global best practices to the Indian context.

Core aims

- Single policy framework for all IPRs with clear implementation, oversight and evaluation.
- Indianised best practices align with international standards while safeguarding public interest.

Pillars (7) + Driver

1. IPR Awareness (Outreach & Promotion): Mass literacy, campaigns, curricula, resources for citizens, creators, MSMEs and startups.
2. Generation of IPRs: Convert India's knowledge base (academia/R&D) into patents, trademarks, designs, etc.; enable filings and innovation culture.
3. Legal & Legislative Framework: Keep laws TRIPS-consistent, updated, and balanced between creator rights and access to knowledge.
4. Administration & Management: Make IP offices efficient-digitisation, simplified processes, reduced pendency, better user experience.
5. Commercialisation of IPR: Enable licensing, tech transfer, valuation and monetisation; link IP owners with markets/industry.
6. Enforcement & Adjudication: Strengthen anti-infringement mechanisms, quicker and fair dispute resolution.
7. Human Capital Development: Build skills and training in IP law, management and enforcement across institutions.

Driver: CIPAM (Cell for IPR Promotion and Management): Nodal mechanism to implement the policy, drive awareness and streamline processes

International IP Index (US Chamber, 2024)

- **India: Rank 42/55**, score **38.64%**; **US, UK, France** lead.

Indian Patents Act (1970; amended 1999/2002/2005/2016)

- **Objective:** TRIPS-compliant innovation with public interest balance.

Key Features

1. **Patentable Inventions**: Novel, inventive, industrially applicable; excludes traditional knowledge, frivolous inventions, software per se (Section 3).
2. **Patent Term**: 20 years from filing (Section 53).
3. **Compulsory Licensing**: Allows non-patentee production if public needs unmet or prices high (e.g., Nexavar, 2012) (Section 84).
4. **Patent of Addition**: For improvements to existing patents (Section 54).
5. **Anti-Evergreening**: Section 3(d) restricts patents for minor drug modifications unless efficacy enhanced.
6. **Process**: Filing, examination, publication (18 months), grant/rejection; FER within 6 months.
7. **Patentee Rights**: Exclusive make/use/sell/import rights (Section 48).

Key Points

- **Sec 3(d):** New form of known substance must show **enhanced efficacy**.
- **Compulsory licensing:** Public needs/affordability/non-working triggers.
- **20-yr term** → then public domain.

Significance of the Indian Patents Act

- **Public health access** (anti-evergreening, CL).
- **Genuine innovation focus** vs incremental monopolies.
- **Global generics** & South-South access implications.

Evergreening

- Extending exclusivity via minor tweaks (dose/form/delivery) without real efficacy gain; Section 3(d) curbs this.

Compulsory Licensing in India

- TRIPS-consistent tool for **affordability/availability** (royalty to patentee); complements **Sec 3(d)** in public health balance.
- Novartis case

Controversies Surrounding the Indian Patents Act

- Evergreening vs Access: Pharma MNCs say Section 3(d) stifles innovation; supporters call it vital to prevent artificial patent extensions and keep drugs affordable.
- Compulsory Licensing (CL): Patent holders view CL as IP erosion; public-health advocates see it as a TRIPS-compatible safeguard to ensure availability/affordability.
- High-profile Litigation: Cases like Novartis–Gleevec put India's regime under the global spotlight, fuelling debates on drug prices and access to medicines.
- Domestic R&D Concerns: Strict patentability thresholds may dampen pharma R&D and global competitiveness of Indian firms, say critics.
- Health Emergencies: Provisions enabling rapid supply of medicines are crucial in crises, yet often contested by global companies on IP grounds.

World Intellectual Property Organisation (WIPO)

- **Role:** Promotes global protection of intellectual property rights.
- **Key Treaties**:
  - **Paris Convention**: Protects industrial property, including patents and trademarks.
  - **Berne Convention**: Governs international copyright.
  - **Budapest Treaty**: Recognizes microorganism deposits for patent procedures.
  - **Marrakesh Treaty**: Facilitates book access for the visually impaired.
  - **Patent Cooperation Treaty**: Simplifies international patent applications.
  - **TRIPS Agreement**: Sets standards and enforcement for global IP protection.

57. Innovation

- **Definition:** New ideas/tech improving products/process efficiency.
- India's innovation profile is strengthening: Global Innovation Index (GII)2024 rank 39, WIPO 2023 IP filings rank 6, and Network Readiness Index (NRI) 2024 rank 49 (up from 79 in 2019) among 133 economies.
- Takeaway: Strong IP activity and improving digital readiness are underpinning India's steady rise in global innovation standings.

Current State of R&D in India and Its Implications
• **GERD ₹60k cr → ₹1.27 lakh cr (2011→2021)** but **%GDP 0.76 → 0.64**. • Sources of R&D Funding: **Central 43.7%**, **Private 36.4%** (low vs peers like Korea,Japan and US around 70%). • India's higher-education sector contributes a smaller share to national R&D than peer countries like Australia (36%), Canada (39%), the UK (24%), and the US (11%) • Sectoral R&D Spending: **Pharma 33.6%**, **Textiles 13.7%**, **Defence 7.3%**; **IT 10%**, **Transport 7.7%**.

Challenges in Innovation in India
• Low GERD, skill gaps/brain drain, IP enforcement weakness, infrastructure, regulatory delays (avg pendency 42 months), startup finance, industry–academia collaboration gap, gender disparity (in STEM only 34% women), Cultural Attitudes Towards Innovation.

The Anusandhan National Research Foundation (ANRF)
The Anusandhan National Research Foundation (ANRF) was established under the ANRF 2023 Act to promote research and development (R&D) across India's educational and research institutions. • **Act 2023**; integrates **SERB**; aligns with **NEP**. • **Mission:** Catalyse R&D across HEIs; industry-academia-government collaboration; state/industry interface.

Vigyan Dhara Scheme
• **MoS&T** Central Sector Scheme of Ministry of Science and Technology to boost **S&T capacity**, **research**, **innovation**. • **Key objective:** To promote **S&T capacity building** as well as **research, innovation and technology development** towards strengthening the Science, Technology and Innovation ecosystem in the country. **KAPILA** • A systematic, comprehensive effort called "KAPILA, Kalam Programme for IP Literacy and Awareness" addresses the current barriers in the innovation ecosystem, particularly in our HEIs **Measures — National Initiatives** • Skill India, National IPR Policy 2016, Research Parks/Clusters (e.g., IIT-M RP), Digital India/regulatory reforms, Startup India & MSME finance (Samadhaan), UAY (academia-industry). **Measures — Department-Specific Programs** **National Initiatives** 1. **Skill India Mission** o **Objective**: Train over 400 million individuals in various skills by 2022 to address the skill gap and retain talent within India.

2. **National Intellectual Property Rights Policy, 2016**
- **Goals**: Enhance IPR awareness and strengthen enforcement while simplifying the processes for patent and trademark applications to encourage innovation.
3. **Promotion of Research Parks and Innovation Clusters**
- **Example**: Establishment of facilities like IIT Madras Research Park to provide necessary infrastructure for R&D.
4. **Digital India and Regulatory Reforms**
- **Purpose**: Use technology to streamline bureaucratic processes and foster a culture of innovation through initiatives such as the Atal Innovation Mission.
5. **Startup India and Funding Initiatives**
- **Benefits**: Offer tax benefits and establish funds to support startups and SMEs, including schemes like MSME Samadhaan to address finance issues of SMEs.
6. **Uchhatar Avishkar Yojana (UAY)**
- **Aim**: Encourage collaboration between academia and industry to ensure research is aligned with industrial needs and can be commercialized.

Department-Specific Programs
- **Department of Science & Technology (DST)**
- **NIDHI Program**: Supports startups through seed funding, incubators, accelerators, and grants for proof of concept and prototype development.
- **PRAYAS Program**: Provides grants to Technology Business Incubators (TBIs) to support innovators in developing prototypes.
- **NITI Aayog**
- **Atal Innovation Mission (AIM)**: Supports the establishment and scaling of incubation centers.
- **Atal Incubation Centres (AICs)**: Helps in setting up new incubation centers to support innovative startups.
- **Established Incubation Centres**: Provides scaling support to already successful incubation centers.
- **Ministry of Electronics & Information Technology (MeitY)**
- **TIDE Scheme**: Aims to nurture startups in IT and electronics through financial aid to technology incubation centers.
- **TIDE 2.0 Scheme**: Enhances the original TIDE scheme by focusing on emerging technologies like IoT, AI, Blockchain, and Robotics.
- **Department of Biotechnology (DBT)**
- **BIRAC BioNEST**: Establishes and supports bio-incubators for biotechnology startups.
- **SEED Fund**: Provides equity-based funding to startups for scaling up through bio-incubators.
- **LEAP Fund**: Offers equity funding to help startups and enterprises scale up their operations.
- **Ministry of Human Resource Development (MHRD)**
- Focuses on setting up incubation centers and research parks in educational institutions, often in collaboration with DST and DBT.
- Uchhatar Avishkar Yojana (UAY): Encourages innovation by fostering collaborations between academia and industry.
- **GEN-NEXT Support for Innovative Startups (GENESIS)**
- **Objective**: Nurture and accelerate the startup ecosystem, particularly in Tier-II and Tier-III cities.
- **Components**: Includes consolidation of startup-related schemes, investment and pilot funding support, and strengthening of incubators.
- **Budget**: Rs. 490 Crore over 5 years.

The focal point of the Interim Budget 2024 was on the distinct allocation of ₹1 lakh crore funds towards research and development in technology and innovation.

The Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC)

- Apex S&T advisory guides India's science and technology policies (2018-) for **missions**, future preparedness, PPPs, clusters, skills.

PM-STIAC Missions

Key Responsibilities

- **Synergizing Research**: Collaborates with central and state governments to enhance S&T research.
- **Future Preparedness**: Focuses on emerging domains to prepare for future challenges.
- **Mission Coordination**: Formulates and coordinates major inter-ministerial S&T missions.
- **Innovation Ecosystem**: Creates an enabling environment for technology-led innovations and entrepreneurship.
- **Socio-Economic Solutions**: Develops technology-based solutions for sustainable growth.
- **Public-Private Partnerships**: Strengthens linkages to drive research and innovation.
- **Innovation Clusters**: Develops clusters involving academia, industry, and government.
- **Skill Development**: Focuses on skilling in current and future technologies.

PM-STIAC Missions:

1. **Natural Language Translation**: Facilitates access to technology in various Indian languages.
2. **Quantum Frontier**: Develops and deploys quantum technologies.
3. **Artificial Intelligence**: Advances AI technologies and applications.
4. **National Biodiversity Mission**: Conserves and utilizes India's biodiversity.
5. **Electric Vehicles**: Promotes adoption and development of electric vehicles.
6. **Bio-Science for Human Health**: Advances biotech research for health.
7. **Waste to Wealth**: Develops technologies to convert waste into resources.
8. **Deep Ocean Exploration**: Explores and understands the deep ocean.
9. **AGNIi**: Promotes industrial innovation and development.

Additional Content for Prelims — Strengthening Research Infrastructure

- **Fund for Improvement of S&T Infrastructure (FIST):** 121 R&D facilities; 56.9% to PG colleges/universities.
- **Promotion of University Research and Scientific Excellence (PURSE):** 11 new unis in under-served regions + 13 via 2023 call.
- **Synergistic Training program Utilizing the Scientific and Technological Infrastructure (STUTI):** 8,573 researchers trained (+14%); 11,441 school students (+52%).
- **Support for Upgradation Preventive Repair & Maintenance of Equipment (SUPREME):** Repair/upgrade/retrofit analytical instruments.

Strengthening the Start-Up & Innovation Ecosystem

- **National Initiative for Developing and Harnessing Innovations (NIDHI) Program:** seed/incubation/accelerators; **prototype funding** & policy support.

Women in Science & Engineering (WISE) and Related Programs

Women-focused Scheme/Program	Objective
WISE–KIRAN	Advance gender parity in S&T by supporting women researchers across career stages (from doctoral to professional/IPR upskilling).
Vigyan Jyoti	Inspire schoolgirls (Classes IX–XII) to pursue STEM through mentoring, exposure and experiential activities.

CURIE	Strengthen research infrastructure in women's institutions to enable high-quality, innovative R&D.

Global Innovation Index (GII)

- **Publisher:** WIPO with Cornell Univeristy/INSEAD.
- **India: 39/133** (latest); **+42 places since 2015**; top in **lower-middle-income** & **Central/South Asia**; major **S&T clusters** (Mumbai/Delhi/BLR/Chennai); strong **intangible assets**.

UPSC Previous Year Questions (PYQs) on IPRs

- **2017:** Nat'l IPR Policy—TRIPS/Doha alignment; **DIPP/DPIIT nodal → Both correct (c)**.
- **2019:** Seeds via biological process not patentable; **IPAB existed then**; **Plant varieties not patentable (PPVFR) → (c) 3 only**.

UPSC PYQ - 2019

Question: Consider the following statements:

1. According to the Indian Patents Act, a biological process to create a seed can be patented in India.
2. In India, there is no Intellectual Property Appellate Board.
3. Plant varieties are not eligible to be patented in India.

Which of the statements given above is/are correct?

(a) 1 and 3 only
(b) 2 and 3 only
(c) 3 only
(d) 1, 2 and 3

Answer: (c) 3 only

Q6. Which program primarily builds **IP literacy** in HEIs?

(a) NIDHI
(b) KAPILA
(c) TIDE 2.0
(d) CURIE

Ans: (b)

Differentiate the mandates of WIPO and WTO-TRIPS. How can India use both platforms to safeguard developmental flexibilities while scaling up its innovation ecosystem?

Honour killing

- **Meaning:** Murder/violent punishment by relatives/community to "restore honour" after perceived norm breaches (choice of partner, premarital relations, gender non-conformity).
- **Core idea:** Control over women's sexuality/choice; community enforcement of endogamy.

Causes of Honour Killings

- **Patriarchy:** Women's agency suppressed; honour tied to chastity/obedience; marriage preserves lineage/property.
- **Caste system:** Inter-caste unions (esp. higher-caste women) provoke violence to maintain "purity."
- **Cultural norms: Khap panchayats**/community councils enforce endogamy; crimes often treated as "private."
- **Other factors:** Religion/economic gaps, "love jihad" narratives, backlash to women's mobility; men also targeted as "transgressors."

Triggers

- Inter-caste/inter-religious relationships;
- Premarital sex/"unapproved" affairs;
- Refusal of arranged marriage;
- **Same-gotra** marriages opposed by khaps.

State's Failure

- **Under-reporting/misclassification:** NCRB (25 in 2020; 33 in 2021) vs. NGO data (e.g., 195 in TN over five years).
- **Lack of prevention:** Few shelters/legal-aid/safe houses; focus is post-incident.
- **Policing/judicial bias:** Weak enforcement despite court strictures (e.g., *Deepika v. State of U.P.*, 2013).
- **Systemic tilt:** Laws/policies (e.g., anti-conversion acts) seen as curbing autonomy.

Current Gaps

- **No specific national law;** cases booked under IPC (Secs. 299–304, 107–116).
- **SC/ST Act (1989):** Addresses caste atrocities but not tailored to honour crimes.
- **Drafts pending:** Rajasthan Bill (2019), NCW proposals not fully operationalised.

Supreme Court Judgements

- **Lata Singh v. State of UP (2006):** Article 21 right to marry; police protection to consenting adults.
- **Arumugam Servai v. State of TN (2011):** Khap diktats illegal; strict action urged.
- **Shakti Vahini v. Union of India (2018):** Khap interference banned; mandatory FIRs, safe houses, fast-track trials (≈6 months); re-affirmed **right to choose spouse**.

What is Caste

- **Definition:** Hereditary, endogamous groups (jatis) with shared name/occupation/culture; rigid hierarchy with limited mobility.
- **Varnas → Jatis:** Classical four varnas fragmented into numerous **jatis** that function as modern castes in India.

58. Online Gaming Bill 2025: Sunrise Sector, Rising Challenges

Category: Economy, Technology & Governance | GS Paper II & III

What is in the News?

The Online Gaming Bill, 2025 aims to regulate India's fast-growing gaming sector, which has emerged as both an economic driver and a social challenge.

Growth Drivers

- **Technology:** Affordable smartphones, 5G rollout, and cloud gaming platforms.
- **Policy Support:** IT Rules (2021, amended 2023) and AVGC Task Force recommendations.
- **Cultural Shift:** Surge in gaming during COVID-19; recognition of e-sports at global events.
- **Economic Push:** Over 400 start-ups, unicorns such as Dream11 and MPL, and $2.8 billion investment inflows (2024).

Regulation and Challenges

- **Legal Basis:** IT Act 2000, IT Rules 2021/23 (establishing SRBs), Bharatiya Nyaya Sanhita 2023 (Sections 111 & 112 on illegal betting), IGST Act 2017 (offshore platforms), Consumer Protection Act 2019 (advertising).
- **Challenges:**
  - Fragmented state laws leading to legal uncertainty.
  - Money laundering and illegal gambling (UNODC: $350 bn global betting market).
  - Rising addiction: 87% students gaming regularly; 23% report stress.
  - Cybersecurity breaches (11 million accounts in 2024).
  - Financial instability: ₹20,000 crore annual losses; GST at 28% discourages small firms.

Way Forward

- Establish a **central regulator** for uniform rules.
- Encourage **responsible gaming practices** (age limits, spending caps, helplines).
- Strong **AML monitoring** with RBI and global cooperation.
- Cyber resilience with audits, encryption, and GDPR-style compliance.
- Promotion of gaming hubs under **Digital India and Start-up India**.

Relevance for UPSC

- **GS II:** Federalism, regulation of digital platforms, consumer protection.
- **GS III:** Cybersecurity, money laundering, sunrise industries, digital economy.
- **Essay:** Balancing innovation with ethics and societal well-being.

PYQs and Linkages

- GS II (2022): Challenges of regulating online platforms.
- GS III (2019): Technology shaping new economic sectors.
- Essay (2021): "Technology is a useful servant but a dangerous master."

Conclusion

India's gaming industry is a sunrise sector with global potential. But without clear regulation, it risks addiction, financial fraud, and social harm. A framework of **Governance, Awareness, Monitoring, and Engagement (GAME)** can balance innovation with safeguards.

59. US Tariffs Shock Indian Exports

Category: Economy & Trade | GS Paper III

What is in the News?

The United States imposed steep tariffs (50 percent and above) on India's labour-intensive exports, disrupting sectors such as shrimp, textiles, jewellery, and carpets.

Worst-hit Sectors

- Shrimp exports: $2.4 bn (32 percent share) with prices falling over 20 percent in Andhra Pradesh.
- Jewellery: $10 bn exports (40 percent share); 12 lakh workers in Surat affected.
- Textiles and apparel: $10.8 bn exports (35 percent share); major disruption in Tiruppur, Noida, Gurugram.
- Carpets: $1.2 bn exports (58 percent share).
- Also impacted: handicrafts, footwear, rice, spices.

Moderate Impact

- Chemicals ($2.7 bn), metals ($4.7 bn), machinery ($6.7 bn) less hit due to smaller US market dependence.

Implications

- Job losses in SMEs and export hubs.
- Risk of global buyers shifting away from India.
- Pressure on foreign trade balance.

Government Response

- Short-term: relief package under discussion, RBI credit/liquidity support, promotion of Vocal for Local.
- Long-term: Diversify markets, expand FTAs, build resilience in textiles, shrimp, and jewellery.

Relevance for UPSC

- **GS III:** External sector, trade policy, impact of protectionism.
- **GS II:** India-US economic relations.
- **Essay:** Globalisation and protectionism.

PYQs and Linkages

- GS III (2020): Impact of protectionism on globalisation.
- GS II (2016): Balancing growth and resilience in foreign trade policy.

Conclusion

The tariff shock demonstrates India's vulnerability in labour-intensive exports. Strategic diversification, FTAs, and resilience-building are critical for insulating India from external shocks.

60. Energy Sovereignty in an Unstable World

Category: Economy, Energy Security & Environment | GS Paper III

What is in the News?
With 85 percent crude and over 50 percent natural gas imports, India faces severe energy vulnerability. Recent global flashpoints such as the Israel–Iran crisis, the Russia–Ukraine war, and the Iberian blackout have highlighted the urgency of energy sovereignty.

Import Dependence and Risks
• Russia now supplies 35–40 percent of India's crude (up from 2 percent pre-Ukraine war). • Crude and gas imports worth $170 billion account for one-fourth of total imports. • Over-dependence on discounted Russian oil is strategically risky.

Global Flashpoints and Lessons
• 1973 Arab Oil Embargo → creation of Strategic Petroleum Reserves. • 2011 Fukushima disaster → nuclear scepticism. • 2022 Ukraine war → Europe's gas crisis. • 2025 Iberian blackout → lessons on renewable over-dependence.

Energy Transition vs Realism
• Fossil fuels still provide more than 80 percent of global energy demand. • Solar and wind contribute less than 10 percent. • Decline in oil and gas investments despite sustained demand creates volatility.

Five Pillars for India's Energy Sovereignty
1. Coal Gasification: 150 billion tonnes reserves for syngas, hydrogen, fertilizers. 2. Biofuels: E20 blending transferring ₹92,000 crore to farmers; SATAT scheme for compressed biogas. 3. Nuclear: Thorium roadmap, uranium partnerships, and small modular reactors. 4. Green Hydrogen: 5 MMT target by 2030; indigenous electrolyser development. 5. Pumped Hydro Storage: Grid balancing and renewable backup.

Policy Context
National Hydrogen Mission, SATAT scheme, E20 roadmap, nuclear expansion plan.

UPSC Keywords
Energy Sovereignty, Green Hydrogen, Coal Gasification, Biofuels, Small Modular Reactors

PYQs and Linkages
• GS III (2023): India's energy security challenges in global geopolitics. • Essay (2018): Alternative technologies for a climate-smart future.

Conclusion
India must secure energy sovereignty by balancing traditional and renewable sources, ensuring long-term stability and strategic autonomy.

61. What is a Goldilocks Economy

A Goldilocks economy describes an ideal economic condition where growth is steady and moderate—neither too fast to cause high inflation nor too slow to trigger recession or unemployment. It features balanced GDP growth, low and stable inflation, near-full employment, and supportive monetary policies, creating a harmonious environment for economic progress. The term, inspired by the fairy tale where everything is "just right," reflects a state where businesses thrive, consumers spend confidently, and policymakers maintain control without extreme measures.

Is India a Goldilocks Economy?

India exhibits some Goldilocks characteristics, with strong GDP growth and controlled headline inflation, earning it a "mini-Goldilocks moment" label from the Finance Ministry due to 7.6% growth in FY24 and 2.82% CPI inflation in May 2025. However, challenges like food price volatility, wage disparities, and fiscal risks prevent it from being a fully balanced Goldilocks economy, as reflected in economic data and expert analyses.

Why Yes: Substantiating Factors

- **Moderate GDP Growth**: India's real GDP grew 6.5% in FY25, with IMF and RBI projecting 6.3-6.8% for FY26, driven by robust domestic demand and stable policies. This steady pace supports the Goldilocks ideal of consistent expansion.
- **Low Inflation**: Headline CPI dropped to 2.1% in June 2025 from 4.8% in May 2024, with core inflation stable below 5%, allowing RBI rate cuts and boosting consumer spending, aligning with the low-inflation criterion.
- **Employment Trends**: Real wage growth averaged 3.5-4% in 2025 with nominal hikes at 8%, supporting household spending in a post-pandemic recovery, though urban demand drives this more than rural areas.

Why Not: Substantiating Challenges

- **Volatile Food Inflation**: Despite low CPI, food prices surged to 10.87% in October 2024 and remained high at 5.66% in August 2025, hitting low-income households hard (food is ~50% of CPI), undermining balanced consumption.
- **Wage Stagnation and Inequality**: Real wages grew only 4% in 2025, but for lower segments, inflation erodes gains, with a high Gini coefficient (~0.35-0.4) indicating persistent inequality, deviating from full employment ideals.
- **Fiscal and External Risks**: Fiscal deficit is projected at 4.9% for FY26 with high debt reliance, while unreliable unemployment data (7-8%) and rural distress signal vulnerabilities, contrasting with a stable Goldilocks state.

62. E3 Nuclear deal

E3 refers to a group consisting of France, Germany, and the United Kingdom, which collaborates on global diplomacy, particularly focusing on nuclear non-proliferation efforts. The E3 has been a key player in negotiations related to the Iran nuclear issue since the early 2000s and was part of the 2015 Iran Nuclear Deal, known as the Joint Comprehensive Plan of Action (JCPOA)

Context:

- Iran confirmed new nuclear talks with the E3 (Britain, France, Germany) on July 25, 2025, in Istanbul, the first since U.S. and Israeli strikes on Iranian nuclear sites in June 2025.
- The talks follow E3 warnings of reimposing sanctions via the JCPOA's "snapback" mechanism if Iran doesn't negotiate, amid accusations of Iran pursuing nuclear weapons.

Background

The JCPOA unraveled after the U.S. withdrew in 2018 under Trump, reimposing sanctions. Israel's June 13 and U.S. June 22 strikes hit Iran's nuclear facilities (Fordo, Isfahan, Natanz), halting prior U.S.-Iran talks mediated by Oman.

E3's Stance: A German source emphasized that Iran "must never" acquire nuclear weapons, pushing for a diplomatic solution. The E3 met Iran in Geneva on June 20, 2025, before the U.S. strikes.

Iran's Position: Foreign Minister Abbas Araghchi rejected snapback sanctions as lacking legal/moral grounds, citing E3 support for U.S./Israeli strikes as voiding their JCPOA role. Iran insists on continuing uranium enrichment, as stated by advisor Ali Velayati.

Joint Comprehensive Plan of Action (JCPOA)

- **Signed**: 2015, between Iran, E3 (Britain, France, Germany), U.S., Russia, China, EU.
- **Purpose**: Limit Iran's nuclear program to prevent weapon development in exchange for sanctions relief.
- **Key Provisions**:
  - Iran reduces uranium enrichment, caps stockpile, limits centrifuges, allows IAEA inspections.
  - Sanctions lifted on Iran's oil, banking, trade sectors.
- **Status**:
  - U.S. withdrew in 2018 (under Trump), reimposed sanctions.
  - Iran scaled back compliance post-2018, increasing enrichment.
- **Recent Developments (2025)**:
  - U.S./Israel strikes on Iran's nuclear sites (June 2025) halted prior talks.
  - E3-Iran talks resumed (July 25, 2025, Istanbul) to revive deal; snapback sanctions threatened if no progress.
- **Challenges**:
  - Iran insists on enrichment; E3/U.S. demand non-proliferation.
  - Mutual distrust, U.S. absence, and geopolitical tensions hinder progress

63. Israel-Palestine Conflict

The Israel-Palestine conflict is a protracted territorial, political, and nationalist dispute over the land historically known as Palestine, involving competing claims by Jews (seeking a homeland post-Holocaust) and Arabs (asserting indigenous rights). It encompasses issues like borders, Jerusalem's status, refugee rights, settlements, and security.

Historical Context

- **Pre-1948**: Under Ottoman rule until 1917 and British Mandate from 1920-1948, Jewish immigration surged due to the Balfour Declaration (1917), which supported a Jewish homeland, triggering Arab revolts (1936-39) over fears of displacement. This era turned the region into a tense mix of Jewish hopes for safety post-persecutions and Arab demands for self-rule, setting up deep divisions.
- **UN Partition Plan (1947)**: The UN proposed dividing Palestine into Jewish (55%) and Arab (45%) states to resolve post-WWII tensions, with Jews accepting it as a path to statehood after the Holocaust, but Arabs rejecting it over unequal land distribution and loss of majority areas. This rejection fueled immediate violence, leading to Israel's 1948 creation and the first Arab-Israeli war, displacing hundreds of thousands of Palestinians.
- **External Influence**: U.S. backs Israel (e.g., $3.8B annual aid); Iran supports Hamas; Cold War and regional rivalries complicate peace.
- **Economic**: Control over water/land resources; Gaza's blockade since 2007 has caused 80% poverty rates, driving unrest.

Political Groups

- **Israel**: Led by parties like Likud (right-wing, pro-settlements, Netanyahu until 2025), Labor (center-left, pro-peace), and far-right Otzma Yehudit. Political shifts influence peace prospects.
- **Palestine**: Split between Palestinian Authority (Fatah, West Bank, pro-two-state) and Hamas (Gaza, anti-Israel). Internal divisions weaken unified negotiations.

Why Peace Efforts Failed

- **Mistrust**: Decades of violence (e.g., intifadas, Rabin assassination) eroded goodwill. Both sides doubt sincerity.
- **Internal Divisions**: Hamas-PA split; Israel's right-wing shift (e.g., Netanyahu's 2023-25 coalition) rejected two-state solution.
- **Power Imbalance**: Israel's military dominance and U.S. support (vetoing UN resolutions) marginalize Palestinian leverage.
- **Unresolved Issues**: No consensus on Jerusalem, borders, refugees, or security arrangements; settlements grew 14,000 units in 2024.
- **External Factors**: U.S. bias (e.g., Trump's 2017 Jerusalem move); Iran's backing of Hamas fuels escalation.
- **Recent (2025)**: Gaza war stalled talks; ICJ's 2024 ruling (occupation illegal) ignored; Netanyahu's coalition and Hamas rejectionism blocked progress.

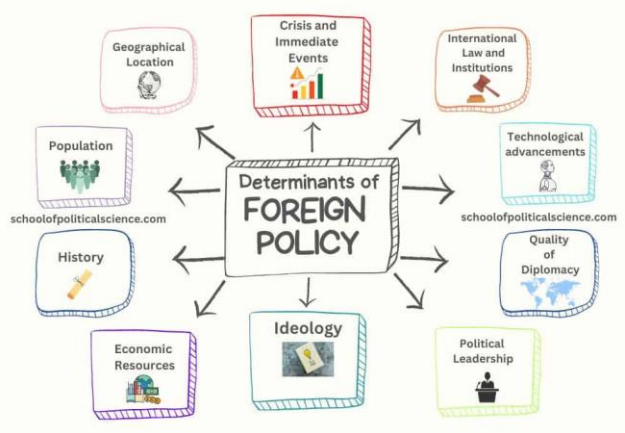
Proposed Solutions
• **Two-State Solution**: Independent Palestine (1967 borders with swaps) alongside Israel; UN/EU/India-backed but stalled by settlements and mistrust. • **One-State Solution**: Single binational state with equal rights; opposed by Israel (demographic shift) and Palestinians (minority fears).

64. Foreign Policy

Meaning of Foreign Policy

- Foreign policy is a nation's strategic plan to guide its actions in global interactions, aimed at safeguarding and promoting national interests.
- It encompasses principles, decisions, and actions to shape other states' behavior, blend of diplomacy (e.g., negotiations) and power (e.g., military strength) to achieve goals.

Determinants of Foreign Policy



- **Internal Determinants**:
  - **Geography**: The physical features like size, location, climate, and resources influence policy. For instance, India's strategic position in the Indian Ocean enhances its maritime security focus, shaping its naval diplomacy.
  - **History and Culture**: Past events and traditions guide policy objectives. India's anti-colonial stance, rooted in its freedom struggle, led to a strong anti-imperialism policy, while Panchsheel (1954) reflects its Buddhist-inspired peace principles with China.
  - **National Capacity**: Military, economic, and technological strength shapes influence. The U.S. leveraged its economic power during the Cold War, whereas the Soviet Union's decline post-1991 weakened its global stance, affecting alliances.
  - **Public Opinion**: In democracies, it sets policy limits. The U.S. public pressure in the late 1960s, fueled by Vietnam War casualties and media coverage, forced a troop withdrawal by 1973, showing its impact.
  - **Ideology**: Beliefs drive international behavior. The Cold War (1947-1991) pitted U.S. capitalism against Soviet communism, influencing proxy wars like in Korea and Vietnam.

- **External Determinants**:
  - **World Organizations**: Bodies like UN, IMF, and SAARC shape policy through peace and economic norms. UN peacekeeping missions, for example, guide India's troop contributions globally.
  - **World Public Opinion**: Global views pressure policy. International outcry over human rights in Kashmir (e.g., 2019 Article 370) influences India's diplomatic responses.
  - **Foreign Policies of Other States**: Reactions of other nations matter. India adjusts its China policy based on border tensions (e.g., 2020 Galwan clash), considering Beijing's assertive actions.

65. Diplomacy

Diplomacy = practice of managing international relations through **dialogue, negotiation, and cooperation** to advance **national interests, resolve conflicts, and build mutual trust.**

Meaning of Foreign Policy

1. Traditional Diplomacy (State-Centric)

- **Traditional diplomacy =** formal, state-led (by ambassadors, diplomats).
- **Modern diplomacy =** also includes non-state actors (NGOs, corporations, media, diaspora).

2. Issue-Based Diplomacy (Modern and Specialized)

- Economic Diplomacy → Trade, investment, sanctions as tools.
  Example: India–ASEAN Free Trade Agreement.
- Cultural Diplomacy → Promoting culture/heritage for goodwill.
  Example: India's Buddhist circuit tourism projects.
- Public Diplomacy → Engaging foreign citizens via media/education.
  Example: PM Modi's diaspora outreach in the U.S.

3. Coercive or Power-Based Diplomacy

- **Gunboat Diplomacy** → Use of military/naval power.
  Example: Historic naval presence in Indo-Pacific.
- **Dollar Diplomacy** → Using aid/investments for influence.
  Example: China's Sri Lanka infrastructure funding.
- **Coercive Diplomacy** → Threats or limited force to compel.
  Example: India's 2019 Balakot airstrikes against terror camps

4. Actor-Based Diplomacy

- **Citizen Diplomacy** → NGOs/individuals bridging cultures.
  Example: India–Africa people-to-people exchange.
- **Commercial Diplomacy** → Business leaders as representatives.
  Example: Indian IT firms shaping U.S.–India trade ties

5. Niche or Emerging Diplomacy

- **Sports/Cricket Diplomacy** → Sports easing tensions.
  Example: India–Pakistan cricket diplomacy.
- **Track II Diplomacy** → Informal backchannel talks.
  Example: Academics/retired officials in India–Pakistan dialogue.
- **Diaspora Diplomacy** → Using diaspora as strategic asset.
  Example: Indian diaspora lobbying in U.S. Congress

Takeaway
Diplomacy today is multi-dimensional — it combines statecraft, economy, culture, technology, and people power, making it vital for India's rise in a multipolar world.

66. Strategic Partnership

- **Definition:** A **formal, long-term alliance** between countries/entities to pursue **shared strategic goals** across defense, economy, technology, and diplomacy.
- Goes **beyond routine relations** → emphasizes alignment to tackle common challenges and shape global/regional order

Features of Strategic Partnerships
1. **Comprehensive Engagement** – covers defense, trade, energy, technology, culture.
2. **Mutual Strategic Interests** – aligns on security, stability, economic growth.
3. **Regular High-Level Dialogues** – summits, ministerial talks, 2+2 dialogues.
4. **Broad Scope** – includes defense pacts, economic ties, tech transfer, cultural exchanges.
5. **Long-Term Commitment** – institutionalized via MoUs, joint commissions.
6. **Geopolitical Balancing** – tool to counter external threats/major power influence.
7. **Flexibility** – not binding like military alliances; preserves sovereignty.
8. Institutional Frameworks – supported by treaties, joint statements, annual summits

India-Strategic partnership
1. India–US Comprehensive Global & Strategic Partnership
• **Established:** 2000; elevated 2015.
• **Focus:** Defense (Quad, BECA/COMCASA agreements), nuclear cooperation, tech transfer, $190 bn trade (2022).
• **Geopolitical Role:** Balances China in Indo-Pacific.
2. India–France Strategic Partnership
• **Established:** 1998.
• **Areas:** Rafale jets, space satellites, Indo-Pacific cooperation, **International Solar Alliance**.
• **Recent:** French backing for India's UNSC bid.
3. India–Russia "Special & Privileged Strategic Partnership"
• **Established:** 2000.
• **Pillars:** Kudankulam nuclear project, S-400 missiles, BRICS/SCO forums.
• **Role:** Reliable arms supply despite shifting global order.
4. India–Japan "Special Strategic & Global Partnership"
• **Established:** Upgraded 2014.
• **Areas:** Mumbai–Ahmedabad bullet train (MAHSR), 2+2 defense talks, semiconductor cooperation.
• **Strategic Fit:** Anchors Act East Policy.
5. India–Australia Comprehensive Strategic Partnership
• **Established:** Elevated 2020.
• **Scope:** Malabar naval drills, trade (ECTA), critical minerals.
• **Importance:** Diversifies supply chains, Indo-Pacific cooperation.

Significance for India
• Enhances **multi-alignment** and autonomy in global affairs.
• Balances **China's rise**, secures energy and defense supplies.
• Boosts economic integration and technology access.
• Positions India as a **leading voice in multilateral forums (UNSC, Quad, BRICS, G20).**

67. India-Philippines Strategic Partnership

- **Date**: August 7, 2025
- **Leaders**: PM Narendra Modi (India) and President Ferdinand Marcos Jr. (Philippines)
- **New Status**: Elevated bilateral ties to a Strategic Partnership.

Recent Announcements (August 7, 2025)

- **Sovereign Data Cloud Infrastructure**: India to support a pilot project for the Philippines' Sovereign Data Cloud Infrastructure to enhance digital capabilities.
- **Information Fusion Centre – Indian Ocean Region (IFC-IOR)**: Philippines invited to join IFC-IOR for improved maritime domain awareness.
- **Gratis E-Tourist Visa**: One-year visa-free facility for Filipino nationals starting August 2025 to boost tourism.
- **Commemorative Stamp**: Joint issuance to celebrate 75 years of diplomatic relations (1949–2024).

- **Preferential Trade Agreement**: Terms of Reference adopted for negotiations to strengthen economic ties Bounded by the Philippine Sea (east), Celebes Sea (south), Sulu Sea (southwest), and South China Sea (west and north).

Historical Context of India-Philippines Relations

- **Early Cooperation**: Built on shared democratic values and non-aligned movement principles, with both nations as UN founding members.
- **Key Milestones**:
  - 2022: Philippines became the first buyer of India's BrahMos missiles.
  - 2023: MoU for JWG on Financial Technology to advance digital payments and fintech.
  - 2024: Bilateral trade reached $3.53 billion, up from $2.03 billion in 2020–21.

Strategic and Defense Cooperation

- **Maritime Exercises**: First joint naval drills in the South China Sea (2025), with India deploying three warships to the Philippines.
- **BrahMos Deal**: Philippines acquired BrahMos missiles, with talks for further purchases and submarine infrastructure collaboration.
- **Strategic Alignment**: Supports India's Act East Policy (2014) and Indo-Pacific vision, emphasizing ASEAN centrality and maritime security.
- **South China Sea**: Challenges China's "nine-dash line" claims, aligning with the 2016 UNCLOS ruling.

Humanitarian and Multilateral Support

- **COVID-19**: Indian community and Embassy provided $250,000 in face masks in 2020.
- **UN Support**: Philippines backs India's UN Security Council permanent seat bid (G4 initiative) and non-permanent memberships (2011–12, 2021–22). India supports Philippines' 2027–28 candidacy.
- **ASEAN Role**: Philippines is ASEAN-India Dialogue Relations Coordinator (2024–2027).

Areas of Cooperation

• **Sectors**: Trade, maritime security, technology, tourism, culture, space, and defense
• **Defense Highlights**:
  o Philippines acquired BrahMos missile systems from India, with plans for more purchases
  o Discussions on developing submarine infrastructure for future collaboration
• **Maritime Activities**: First joint naval exercises in the South China Sea, with India deploying three warships to the Philippines
 	
As India aims for "Viksit Bharat" by 2047 and the Philippines pursues its development goals, cooperation in tech, digital infrastructure, and defense will deepen.

68. Indus Waters Treaty (IWT)

Indus Waters Treaty (IWT): Background

- Signed 19 Sept 1960, mediated by World Bank, between India & Pakistan.
- Governs 6 rivers of the Indus system (Indus, Jhelum, Chenab – western; Ravi, Beas, Sutlej – eastern).
- Survived wars (1965, 1971, 1999), but now strained by terrorism, climate change, and India's April 2025 suspension after the Pahalgam terror attack.

Key Features of IWT

- Allocation:
  - Eastern Rivers (Ravi, Beas, Sutlej): Full use to India (~33 MAF; 20%).
  - Western Rivers (Indus, Jhelum, Chenab): ~135 MAF (80%) to Pakistan; India only non-consumptive use, limited irrigation (701,000 acres), run-of-river hydropower.
- Storage: India capped at 3.6 MAF on western rivers; no diversion allowed.
- Dispute Resolution:
  1. Permanent Indus Commission (PIC) – routine issues.
  2. Neutral Expert (NE) – technical "differences."
  3. Permanent Court of Arbitration (PCA) – legal disputes.
- Data Sharing: Mandatory exchange (flows, projects).
- Durability: Indefinite; changes need mutual consent.
- World Bank Role: Broker, appoints NE, but no enforcement.

Milestones

- 2016: India suspended PIC meetings post-Uri attack.
- 2019, 2025: India sought maximum eastern river use post-Pulwama & Pahalgam attacks.
- 2023–24: India served notices to amend IWT.
- 2025: India suspended treaty; PCA ruled suspension invalid.

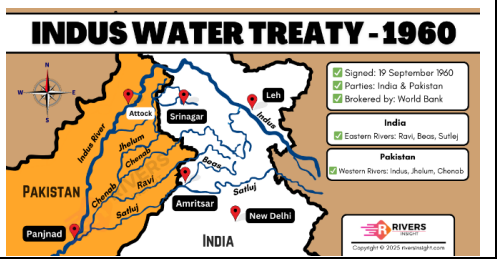
Why Suspension?

- Trigger: April 2025 Pahalgam terror attack by Pak-based militants.
- Security logic: Terrorism + treaty coexistence untenable.
- Actions: India halted data sharing, diverted eastern waters, paused PIC cooperation.
- Legal issue: PCA (June 2025) ruled no exit clause → India's suspension "invalid"; India contested PCA jurisdiction.

Impact

On Pakistan

- Heavily dependent: 80% agriculture, 23% GDP, 68% rural livelihoods.
- 93% freshwater used in farming; major cities (Lahore, Karachi) reliant.



69. What Happened at the Trump-Putin Alaska Summit

The **Alaska Summit** on August 15, 2025, between **US President Donald Trump** and **Russian President Vladimir Putin** aimed to address the **Russia-Ukraine war** but failed to deliver significant progress, raising concerns for Ukraine and global stability.

Key Outcomes
• **No Ceasefire:** Talks ended without a truce. • **Territorial Concessions (reported):** Trump suggested Ukraine consider ceding ~20% territory (Donbas/Crimea); Kyiv rejects. • **Putin's PR Gain:** Red-carpet welcome + U.S. stage boosted his global stature despite ICC warrant. • **Trump's Stance:** Emphasized "root causes" (NATO expansion); plans to pressure Zelenskyy in Aug 18 White House meeting. • **Other Topics:** Putin highlighted trade, space, and Arctic cooperation.

Implications
• **For Ukraine:** Faces pressure but refuses concessions; depends heavily on U.S. aid. • **For NATO:** Alliance cohesion tested—Hungary and Slovakia praised Putin, others pledged continued support. • **Global Concerns:** Signals U.S. retreat from principled mediation → risk of emboldening other irredentist claims (China–Taiwan). • **For India:** Trump's **25% tariff** on Indian goods (effective Aug 27, 2025) over Russian oil imports may be reconsidered, but policy uncertain.

Confirmed vs. Contested
• **Confirmed:** Venue, optics, no ceasefire, tariff timeline, trade/space discussion. • **Contested:** Specific territorial concession deal (leaks, not formal). **Watch Next** • **Aug 18–20:** Trump–Zelenskyy meet → "security guarantees" expected. • **Aug 27:** Tariffs on India to take effect unless revoked. **Q2.** With reference to the Diomede Islands in the Bering Strait, consider the following statements: 1. The International Date Line runs between Big Diomede and Little Diomede. 2. Big Diomede belongs to the United States and lies east of the Date Line. 3. Little Diomede belongs to Russia and lies west of the Date Line. Which of the statements given above is/are correct? (a) 1 only (b) 1 and 2 only (c) 1 and 3 only (d) 2 and 3 only **(a)** — **IDL runs between** the islands; **Big Diomede = Russia (west of IDL)**, **Little Diomede = USA (east of IDL)** *U.S. tariffs on India linked to Russian oil highlight the complexities of strategic autonomy in foreign policy. Discuss in light of India's energy security and multipolar diplomacy.* (GS-II/III, 15 marks)

70. International Criminal Court (ICC)

What is the ICC?

- The **International Criminal Court (ICC)** is the world's first permanent international criminal court, established to prosecute individuals for serious international crimes.
- **Established**: 2002, under the **Rome Statute** (adopted July 17, 1998, effective July 1, 2002).
- **Headquarters**: The Hague, Netherlands.
- **Purpose**: To ensure justice for **genocide**, **war crimes**, **crimes against humanity**, and **crimes of aggression**.

Member Nations

- **Total Members**: 125 countries (as of 2025), including 33 African, 19 Asia-Pacific, 20 Eastern European, 28 Latin American/Caribbean, and 25 Western European/Other States.
- **Non-Members**: Major countries like **India**, **USA**, **China**, **Russia**, and **Israel** have not ratified the Rome Statute.
- **India's Stance**: India opposes the ICC due to concerns over **sovereignty**, **UN Security Council influence**, lack of clarity in crime definitions, and potential politicized prosecutions.

Jurisdiction

- **Crimes Covered** (Rome Statute):

1. **Genocide**: Acts to destroy a national, ethnic, racial, or religious group.
2. **Crimes Against Humanity**: Large-scale attacks on civilians (e.g., murder, torture, rape).
3. **War Crimes**: Violations during armed conflicts (e.g., targeting civilians, using child soldiers).
4. **Crimes of Aggression**: Unlawful use of force against another state's sovereignty (defined in 2010).

- **Conditions for Jurisdiction**:

1. Crimes committed **after July 1, 2002** (no retrospective jurisdiction).
2. Crimes occurred in a **State Party's territory** or by a **State Party's national**.
3. Cases referred by the **UN Security Council** (e.g., Darfur, Libya).
4. National courts are **unwilling or unable** to prosecute (principle of **complementarity**).

- **Limitations**: Lacks universal jurisdiction; cannot prosecute non-members unless referred by the UNSC.

Functions

- **Investigation and Prosecution**: The ICC investigates and tries individuals (not states) for the four core crimes.
- **Complementarity**: Acts as a court of last resort, stepping in only when national courts fail.
- **Victim Protection**: Grants victims rights to participate in proceedings and access support via the **Trust Fund for Victims**.
- **Fair Trials**: Ensures defendants' rights to fair, public hearings in a language they understand.
- **Enforcement**: Relies on state cooperation for arrests, evidence, and sentence enforcement (no police force)

Funding

- Primarily funded by **State Parties' contributions**, based on national income and population (max 22% per country).
- Additional voluntary contributions from governments, organizations, and individuals.

Relationship with the UN

- Not a UN body but has a **cooperation agreement** (Article 2, Rome Statute).
- **UN Security Council** can refer cases outside ICC jurisdiction or defer investigations.

Criticism

- Accused of bias against weaker nations, lacks enforcement power, limited by non-participation of major powers.
- **India's Concerns**: Objects to UNSC's referral power, no opt-out provisions, and exclusion of terrorism/nuclear weapons as ICC crimes.

Q4. Consider the following statements

1. ICJ delivers binding judgments in **contentious cases** only with State consent.
2. PCA tribunals can include non-judges and apply rules chosen by the parties (e.g., UNCITRAL Rules).
3. ICJ tries individuals for genocide and war crimes.

Which of the statements given above are correct?

(a) 1 and 2 only (b) 2 and 3 only (c) 1 and 3 only (d) 1, 2 and 3

Critically analyze India's framework for **enforcement of foreign arbitral awards** under the New York Convention. Do recent amendments to the Arbitration & Conciliation Act, 1996 adequately address **delay** and **public policy** concerns?

71. India–Namibia Relationship (2025)

- **Historic Visit & Honour:** First Indian PM state visit in ~3 decades (July 2025); conferred **Order of the Most Ancient Welwitschia Mirabilis** (Namibia's highest civilian award).
- **MoUs & Platforms:** Entrepreneurship, health; Namibia joins **Global Biofuels Alliance** & **CDRI**; **first in Africa to adopt UPI**.
- **Foundations:** India backed Namibian independence (UN, 1946 onward); SWAPO embassy in Delhi (1986); **Lt Gen D.P. Chand** led UNTAG (1989–90); missions opened 1990/1994.
- **Engagements:** PM-President meets (2015–25), EAM visit & **1st Joint Commission** (2023), Namibian election commission visit (Jan 2025).
- **Capacity Building:** ITEC/ICCR/IAFS scholarships; IAF team trains pilots (Chetak/Cheetah); IT centre (**INCEIT**) set up.
- **Assistance:** Vaccines (30,000 Covishield), food aid (multiple tranches of rice/maize), supercomputer at INCEIT, forensic support.
- **Trade: USD 813.85 mn (2023–24)**; **USD 568.40 mn (2024–25)**; scope in mining, energy, health, edu, agri, infra.
- **People-to-People:** ~450 Indian community; **INCCI** (2016), **INFA** (2020); yoga outreach.
- **Cheetah Project:** 8 cheetahs from Namibia to **Kuno NP** (17 Sep 2022)—first inter-continental carnivore translocation.
- **Why Namibia matters:** Stable polity; **uranium & minerals**; tech/digital cooperation (UPI), Global South alignment, **backs India's UNSC bid**.
- **India's Logic:** (i) Historical solidarity → trust; (ii) Pragmatic cooperation (trade, INCEIT, UPI); (iii) Future-oriented, knowledge-led ties.

Mapping Snapshots
Namibia: SW Africa; **Namib Desert**, Central Plateau, Kalahari; arid 50–600 mm rain; rivers—Cunene/Okavango/Orange/Zambezi; **uranium/diamonds**. **Botswana:** Landlocked; **Kalahari (70%)**, **Okavango Delta**; diamonds; water-scarce. **Rwanda:** "**Land of a Thousand Hills**"; Congo–Nile Divide; gorillas; coffee/coltan; languages: Eng/Fr/Kinyarwanda.

Countries & Engagement (ultra-brief)
• **Burundi:** ITEC/ICCR aid; coffee/tea/nickel; **Lake Tanganyika**. • **Rwanda:** 8 MoUs (2018 visit); coffee/tea/tin; **Lake Kivu** methane. • **South Africa:** Strong trade, **IBSA**; gold/PGMs/coal; Orange/Vaal. • **Botswana:** Diamonds; cheetah tie-ups; Okavango/Chobe. • **Namibia:** Uranium; IT training; cheetah; Namib/Orange/Zambezi. • **Zimbabwe:** Agri capacity; platinum/gold; **Lake Kariba**. • **Zambia:** Copper trade, hydropower; Zambezi/Kafue. • **Malawi:** Health/ITEC; **Lake Malawi**; Shire River. • **Mozambique:** Coal/gas; Zambezi/Limpopo; coast plains. • **Lesotho:** Water cooperation; **Drakensberg**; Orange/Senqu. • **Eswatini:** Trade/ITEC; Highveld–Lowveld zones. • **Angola:** Oil/diamonds; Cunene/Kwango; coastal plain.

East African Rift Lakes (EAR)

- **Origin:** Divergent tectonics → rift basins fill with water.
- **Western Rift: Tanganyika** (longest; ~1,470 m deep), **Kivu** (methane), Albert, Edward.
- **Eastern Rift: Victoria** (largest area), **Nyasa/Malawi** (3rd deepest), **Turkana** (saline, desert).
- **Issues:** Pollution/overfishing (Victoria/Tanganyika); gas risks (Kivu).
- **North→South cue: Victoria → Tanganyika → Kivu.**

Biggest Freshwater Lakes

- **By Area:** 1) **Superior** (~82,100 km²), 2) **Victoria** (~59,947 km²).
- **By Volume:** 1) **Baikal**, 2) **Tanganyika**, 3) **Superior**.

Major Southern African Rivers

- **Limpopo:** SA–Botswana–Zimbabwe–Mozambique → Indian Ocean; floods; agri.
- **Orange:** Lesotho → SA/Namibia → Atlantic; **Gariep Dam**.
- **Zambezi:** Zambia/Angola/Namibia/Botswana/Zimbabwe/Mozambique; **Victoria Falls**, hydropower, floods.

Diamonds — India & World

- **India: Panna (MP)** active; historic Golconda/Krishna; ~<1% global output; global hub for **cutting/polishing (~90%)**.
- **World: Russia** (vol), **Botswana** (value), **Canada/DRC/Australia** notable; mines: **Jwaneng, Orapa, Catoca, Venetia**.
- **Key facts:** Mantle origin via **kimberlite/lamproite**; Mohs **10**; big GDP share for Botswana.
- **Sustainability:** Habitat/water impacts → push for responsible mining.

Kimberley Process (KPCS)

- **What/Why:** Since **2003**, certifies rough diamonds as **conflict-free**; ~**86** participants; start: **Kimberley, SA (2000)**.
- **Mechanism:** Tamper-proof certification from mine to export.
- **Impact:** Conflict diamonds reportedly **<1%**; India enforces KPCS as a major processor.

72. African Union's 'Correct the Map' Campaign

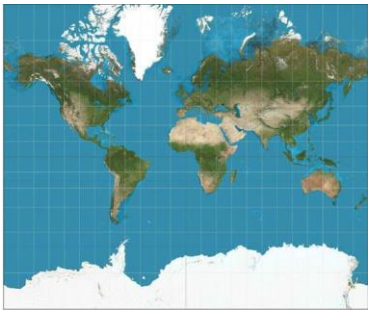
In August 2025, Boston public schools replaced the Mercator Projection with the Gall-Peters Projection in classrooms, highlighting a shift toward maps that prioritize accurate landmass proportions over navigational utility. This change, part of a broader push to address cartographic biases, aligns with the Correct the Map Campaign, which challenges Eurocentric distortions in traditional maps.

Correct the Map Campaign

- **Purpose**: Advocates for replacing Eurocentric maps (like Mercator) with projections that better reflect true landmass sizes and challenge historical biases rooted in colonialism. Aims to promote equitable geographical education and global perspectives.
- **What It Is**: The African Union (AU) supports the 'Correct the Map' campaign to replace the **Mercator map projection** with fairer options like the **Equal Earth map**.
- **Goal**: Correct distortions that misrepresent Africa's size and importance.

Mercator Projection

- **Origin**: Created by Gerardus Mercator in 1569 for navigation during European colonialism.
- **Features**:
  - Distorts sizes, especially near poles; enlarges Europe, Greenland, and North America.
  - Places Europe at the center, pushing the equator downward.
  - Used in atlases, Google Maps, and Apple Maps for ~500 years.



- **Distortions**:
  - Greenland appears as large as Africa (in reality, Africa is ~14 times larger).
  - South America (~twice Europe's size) looks similar in size.
  - Finland appears longer north-south than India (opposite in reality).
- **Criticism**: Eurocentric, fostering imperialist attitudes by overrepresenting Western landmasses.

What's Happening Next?

- **Preferred Option**: **Equal Earth**, adopted by World Bank and NASA; Google uses a 3D globe.
- **Challenges**: Requires updating textbooks and tools, facing resistance.
- **AU Action**: Strong endorsement, petitioning UN for adoption.

73. Nigeria

Context: Recently, Nigeria witnessed a tragic incident in **Katsina state** (northwest region) where armed attackers targeted a mosque and nearby homes during dawn prayers, killing at least 50 people and abducting around 60. Such incidents highlight the persistent security challenges in Africa's most populous country.

Geographical Profile

- **Location:**
  Nigeria is located on the **western coast of Africa**, strategically positioned along the Gulf of Guinea in the Atlantic Ocean, making it a vital hub for maritime trade.
- **Capital:**
  Abuja (shifted from Lagos in 1991) – chosen for its central location to symbolize unity and balance among Nigeria's diverse regions.
- **Neighbouring Nations:**
  - **North:** Niger
  - **Northeast:** Chad
  - **East:** Cameroon
  - **South:** Gulf of Guinea (Atlantic Ocean)

Key Physical Features

1. Rivers & Basins

- The **Niger River** (third longest in Africa) and its major tributary, the **Benue River**, form the primary drainage system.
- The **Niger Delta** is one of the world's largest wetlands and a biodiversity hotspot, but also heavily exploited for oil production.

2. Mountains & Plateaus

- **Jos Plateau** (central Nigeria) – noted for extinct volcanic formations and rich mineral deposits (tin).
- **Chappal Waddi (2,419 m)** – Nigeria's highest peak, part of the Cameroon Highlands, located near the eastern border.
- Other significant uplands include the **Shebshi Mountains** and the **Udi-Nsukka Escarpment**.

3. Plains & Soils

- **Sokoto Plains** in the northwest and **Borno Plains** in the northeast dominate the lowland landscapes.
- **Savanna soils** in central Nigeria support agriculture, while the southern **forest soils** sustain dense tropical vegetation.

Climate

- **North:** Arid and semi-arid climate influenced by the Sahara Desert.
- **Central regions:** Tropical savanna climate with distinct wet and dry seasons.
- **South:** Humid equatorial climate with heavy rainfall supporting lush forests.

Economy & Resources

- **Natural Resources:** Nigeria is richly endowed with petroleum and natural gas reserves, forming the **backbone of its economy** and making it one of the leading oil producers in Africa.
- Other resources include coal, limestone, tin, and agricultural produce (cocoa, groundnuts, and palm oil).
- The **Niger Delta oil fields** are both the economic lifeline and a source of environmental degradation and conflict.
    - Largest

74. India–Japan Relations: A Next-Generation Partnership

Category: International Relations & Economy | GS Paper II

What is in the News?
India and Japan have deepened their partnership in 2025 with a target of JPY 10 trillion trade and investment by 2030 and adoption of a "Joint Vision for the Next Decade".

Trade and Investment
• Bilateral trade: $22.8 bn (2023–24). • Japan's cumulative FDI in India: $43.2 bn (2024). • Presence of 1,400 Japanese firms in India; over 100 Indian firms in Japan. • Joint projects in textiles, logistics, MSMEs under IJICP.

Defence and Security
• Frameworks: Joint Declaration 2008, ACSA 2020. • Joint exercises: Malabar, JIMEX, Milan, Dharma Guardian. • 2025 focus: tri-service drills, cyber and space resilience, counter-terrorism cooperation.

Development and Connectivity
• Japan remains India's largest ODA donor (~JPY 580 bn in 2023–24). • Mumbai–Ahmedabad bullet train project with Japanese technology. • Smart cities, disaster modelling, TOD/MaaS projects.

Multilateral Issues
• Cooperation in Quad for a free and open Indo-Pacific. • Joint support for UNSC reforms. • Common stance on Myanmar, Ukraine, and Middle East crises. • ASEAN cooperation under AOIP framework.

Economic Security Cooperation
• **Semiconductors:** Renesas–CG Power OSAT, Tata–TEL partnership. • **Critical Minerals:** Toyota Tsusho refinery in Andhra Pradesh. • **Clean Energy:** JCM carbon-crediting, bamboo bioethanol, ammonia co-firing projects.

Relevance for UPSC
• **GS II:** Bilateral relations, Act East policy, Indo-Pacific strategy. • **Essay:** Role of partnerships in multipolar world order. • **PSIR:** Strategic autonomy and Asian power balances.

PYQs and Linkages
• GS II (2021): Evaluate India-Japan strategic partnership in the Indo-Pacific. • GS II (2016): Significance of India-Japan civil nuclear agreement.

Conclusion
India–Japan ties have transformed into a comprehensive partnership spanning trade, technology, defence, and global governance. Their cooperation is a pillar of a rules-based Indo-Pacific order.

75. 25th SCO Summit 2025: India's Strategic Stakes

Category: International Relations & Security | GS Paper II & III

What is in the News?
The 25th SCO Summit (Tianjin, 2025) adopted the Tianjin Declaration, long-term strategies, and condemned terrorism including the Pahalgam attack, marking a diplomatic success for India.

Key Outcomes
• Adoption of SCO Development Strategy 2026–35 and Energy Roadmap 2030. • Establishment of SCO Development Bank and 4 new centres (cyber, security, drugs, crime). • Expansion with Laos as new partner; SCO now 27 members.

Terrorism and Security
• Explicit condemnation of Pahalgam, Jaffer Express hijacking, Khuzdar school bombing. • Recognition of terrorism as SCO's core threat. • Correction of earlier omission at Defence Ministers' Meet due to Pakistan's objections.

India's Role
• Advocated three pillars: Security (anti-terror financing), Connectivity (INSTC, Chabahar), and Opportunity (startups, cultural exchange). • Supported UN reforms and SCO civilizational dialogue. • India–China diplomatic thaw after 7 years, signalling cautious rapprochement.

Relevance for UPSC
• **GS II:** Regional groupings, India's multi-alignment strategy. • **GS III:** Regional security threats, terror financing. • **Essay:** Cooperation vs competition in regional security. • **PSIR:** Balance between QUAD and SCO in India's strategy.

PYQs and Linkages
• GS II (2022): India's SCO and QUAD memberships as multi-alignment. • GS II (2017): Role of regional groupings in security.

Conclusion
The SCO summit underlined India's ability to push for anti-terror commitments and connectivity while balancing China and Pakistan. It reaffirmed India's relevance in Eurasian security architecture.

76.Thailand-Cambodia Conflict Over Preah Vihear Temple

Background

Thailand and Cambodia have clashed over the Preah Vihear temple, an 11th-century Hindu temple dedicated to Lord Shiva, built by the Khmer Empire (ancestors of modern Cambodians) atop a cliff in the Dangrek Mountains. The temple, known as Phra Viharn in Thailand, is a UNESCO World Heritage Site (2008) with cultural significance for both nations. The dispute centers on a 4.6 sq km area around the temple, accessible more easily from Thailand but ruled as Cambodian territory by the International Court of Justice (ICJ) in 1962 and 2013.

Recent Clashes (2025)

On July 24, 2025, fighting erupted when Thailand conducted F-16 airstrikes on Cambodian military positions, prompting Cambodia to fire artillery into Thai civilian areas. The clashes, the worst since 2011, killed 43 (14 Thai civilians, 11 Thai soldiers, 8 Cambodian civilians, 5 Cambodian soldiers) and displaced 138,000 in Thailand and 140,000 in
Cambodia. A Malaysia-brokered ceasefire was agreed on July 28, with interim observer teams set up on August 7, 2025.

Reasons for Conflict

- **Historical Claims**: Cambodia, as the Khmer Empire's successor, claims cultural ownership. Thailand controlled the temple from 1794 until 1867, when Siam ceded it to French-controlled Cambodia. A 1907 French survey placed the temple in Cambodia, opposed by Siam (Thailand).
- **ICJ Rulings**: In 1962, the ICJ awarded the temple to Cambodia based on the 1907 map, which Thailand reluctantly accepted. In 2013, the ICJ clarified Cambodia's sovereignty over the surrounding area, but Thailand disputes the 4.6 sq km zone.
- **Nationalist Tensions**: Both countries' leaders fuel nationalism, portraying the temple as a symbol of pride. In 2008, Thailand's support for Cambodia's UNESCO bid sparked protests, leading to a military buildup.
- **Recent Triggers**: A February 2025 altercation over temple access and national anthem disputes escalated tensions. A leaked call between Thai PM Paetongtarn Shinawatra and Cambodia's former PM Hun Sen, where she criticized her military, led to her dismissal and further clashes. Landmine injuries to eight Thai soldiers in July 2025 sparked the latest fighting.

77. ASEAN & India

What is ASEAN

- **Association of Southeast Asian Nations (10 members):** Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam.
- **Founded:** 8 Aug 1967 (Bangkok Declaration).
- **Aims/Principles:** Economic growth, social/cultural development, regional peace; **non-interference**, **consensus**, **sovereignty**.
- **Scale:** 650M+ people; **$3T+ GDP**; major Indo-Pacific actor engaging partners incl. **India/US/China**.

Image: ASEAN

Significance

Strategic and Geopolitical Importance

- Core to India's Act East (2014; evolved from Look East 1991); counters China, esp. South China Sea; backs a free, inclusive Indo-Pacific.
- India (a Quad member) reiterates ASEAN centrality (Quad FMs, Tokyo, 29 Jul 2025).
- High-level outreach: PM Modi to Brunei & Singapore (early Sep 2025); EAM Jaishankar to Laos (25–27 Jul 2025).

Economic Significance

- ASEAN = India's 4th-largest trading partner; trade $110.4B (2021–22) → $130B+ (recent); AIFTA (2010) drives flows but deficit $25.76B (2021–22).
- 21st ASEAN-India Summit (Oct 2024): fast-tracked AITIGA review for digital trade & rebalance by 2025.
- Investments rising in tech/green energy.

Connectivity and Infrastructure Development

- **IMT Trilateral Highway** & **Kaladan** link India's Northeast to ASEAN; **Aug 2025 JCC** pushed acceleration.
- Digital/5G cooperation discussed in **2024** summits.

Defense and Security Cooperation

- **AIME 2023**, participation in **ADMM+**; focus on piracy, terrorism, maritime security.
- **SAGAR**, cyber dialogues, **$5M disaster resilience fund (2024)**.
- Supports ASEAN peace efforts amid **Thailand–Cambodia** border tensions (escalated **Jul 2025**).

Note — ADMM+: ASEAN plus eight dialogue partners; est. **2010** for defense cooperation.

Cultural and Socio-Economic Bonds

Civilizational links (trade, Buddhism); **Friendship Year 2022**, student exchanges, **2025 Year of Tourism** (announced Oct 2024).

- **Delhi Dialogue**, AINTT think-tank network, **Nalanda** scholarships.

Financial and Developmental Support

- **ASEAN-India Cooperation Fund**, **S&T Fund**, **Green Fund** for projects.
- Health cooperation linkages (India's **Rare Diseases Policy 2021**, Kerala's **KARE** as models for 2025 initiatives).

Recent Context
• PM visits (Sep 2025) deepen trade/tech ties; MoS **Pabitra Margherita** at **Pacific Islands Forum** (late Aug 2025). • **Philippines** elevates ties (Aug 2025; ASEAN coordinator 2024–27). • **ASEAN-India Forum (early Aug 2025):** supply-chain resilience amid US-China frictions. • India backs ASEAN mechanisms for **Thailand–Cambodia** ceasefire efforts (**4–9 Aug 2025**).

Broader Significance for India
• Geopolitical leverage and multipolar Asia; growth via trade/investment; Northeast connectivity; tech collaboration (e.g., Singapore); soft-power ties; Indo-Pacific stability.

India-ASEAN Trade Relations
• Track: **1992** (dialogue partner) → **2022** (Comprehensive Strategic Partnership). • **AIFTA/AITIGA:** signed **2009**, effective **1 Jan 2010**. • Trade: ≈**$77B (2019)**; target **$300B by 2025** (lagging due to imbalances). • India exports **pharma/engineering/textiles**; imports **electronics/palm oil/machinery**; strong Indian FDI in ASEAN IT/manufacturing. • **2025 focus:** more equitable framework.

Issues in the India-ASEAN FTA
• **Trade deficit:** ~$5B (2010–11) → **$43B+ (recent)**. • **Rules of Origin:** weak RoO enables **China diversion** via ASEAN (steel/electronics), hurting Make in India. • **Inverted duties:** raw materials taxed higher than finished goods (ferro alloys, Al, Cu, textiles, chemicals). • **Tariff asymmetry/NTBs:** India cut **74%** lines vs ASEAN **56%**; opaque NTBs constrain autos/agri exports. • Other: low utilization (complex certification); global **US tariffs (50% by 27 Aug 2025)** stressing supply chains.

What is India Currently Doing in India-ASEAN Negotiations?
• **AITIGA review** since **Feb 2023** to rebalance by **end-2025**. • **Nine rounds** done; **8th (Apr 2025, New Delhi)** on tariffs/RoO. • **10th round: 11 Aug 2025**, New Delhi; aim for movement by **Oct 2025** under external tariff pressures. • Parallel tracks: **FMs' Meeting (10 Jul 2025, Kuala Lumpur)**; **22nd Summit (27 Oct 2025, Kuala Lumpur)** to push faster review with industry input.

What is the IMT Corridor
• **India–Myanmar–Thailand Trilateral Highway: 1,360 km**, four-lane, Moreh–Mae Sot via Myanmar; cuts logistics costs, boosts integration. • Status **2025: ~70% complete**; India building stretches (e.g., **Kalewa–Yagyi 120.74 km**). Progress slowed by Myanmar conflict; completion beyond 2023 targets.

78. Major Announcements by PM Narendra Modi During His 79th Independence Day

- **Date**: August 15, 2025, marking PM Modi's 12th Independence Day address from the Red Fort.
- **Theme**: A vision for India's rise as a developed nation by 2047, with bold initiatives across technology, energy, employment, and governance.

Key Announcements
1. **Semiconductors**: India will launch its first domestically made chip by year-end, shifting from past failures to a mission mode approach.
2. **Nuclear Energy**: Plans for 10 new reactors to boost capacity tenfold by 2047.
3. **GST Reforms**: Next-generation GST changes, a Diwali gift, will lower taxes on essentials and support MSMEs.
4. **Reform Task Force**: A new task force to drive economic growth, reduce red tape, and modernize governance.
5. **PM Viksit Bharat Rozgar Yojana**: ₹1 lakh crore scheme offering ₹15,000 to 3 crore newly employed youth.
6. **Demography Mission**: A high-powered mission to address demographic imbalances from infiltration, ensuring national security.
7. **Energy Independence**: National Deepwater Exploration Mission to tap ocean resources, plus solar, hydrogen, hydro, and nuclear expansion.
8. **Made in India Jet Engines**: A challenge to scientists and youth to develop indigenous jet engines, akin to vaccine and UPI successes

"Sudarshan Chakra" — Three Meanings (don't mix up)

1. **S-400 "Sudarshan Chakra"** (Russian air-defence in Indian service): Long-range interceptions; part of Op Sindoor (2025).
2. **Mission Sudarshan Chakra** (indigenous multi-layer air-defence shield): To integrate S-400, BMD, **Project Kusha (ERADS)** by ~2035.
3. **XXI Corps "Sudarshan Chakra"** (Army Strike Corps, Bhopal): Offensive deterrent formation vs Pakistan.

79. Kerala Declared India's First Fully Digitally Literate State

Context

Kerala has become the first state in India to achieve full digital literacy, as announced by its Chief Minister after completing Phase I of the Digi Kerala project. The initiative bridges the digital divide by providing basic digital skills across all local administrative bodies.

Digital Literacy

Digital literacy means the ability of individuals and communities to understand and effectively use digital technologies for various daily and professional tasks. A digitally literate household has at least one member (aged 5+) capable of using a computer and accessing the internet.

Key Features of Kerala's Achievement

- Mass Coverage: Surveyed 1.5 crore people from 83.46 lakh families across the state.
- Targeted Intervention: Identified 21.88 lakh digitally illiterate people; 99.98% successfully completed training.
- Inclusive Approach: Covered all ages and backgrounds, including the elderly—one participant was 104 years old.
- Grassroots Orientation: Training was delivered through local bodies, ensuring training matched local needs.

Significance for India's Governance & Development

Key Benefits:

- Bridging the Digital Divide: Promotes access to e-governance, welfare, and financial services (ex: Ayushman Bharat, PM-Kisan).
- Strengthening Digital Democracy: Empowers people to engage with government, file RTIs, and participate in civic life.
- Transparency and Accountability: Increases access to information and government functioning for all.
- Model for Digital India: Kerala's approach is inclusive, focusing on training, not just infrastructure.
- Resilience in Governance: Ensures access to e-services, education, and information during crises.

Concerns:

- Ethical use of the internet (misinformation, radicalization).
- Personal data protection (caution with sharing sensitive info).
- Cybersecurity remains a challenge.

How Kerala Achieved Digital Literacy

1. Pullampara Panchayat's Success: Small team surveyed nearly 4,000 people, trained 3,300, including many elders.
2. Training for All Ages: Contrary to national norms, included everyone—training in smartphone use, digital safety, and online government services. Volunteers and the community were key.
3. Scaling Statewide: Model expanded as Digi Kerala. 2.5 lakh volunteers surveyed 1.5 crore people, trained 21.87 lakh people with a near-perfect success rate.

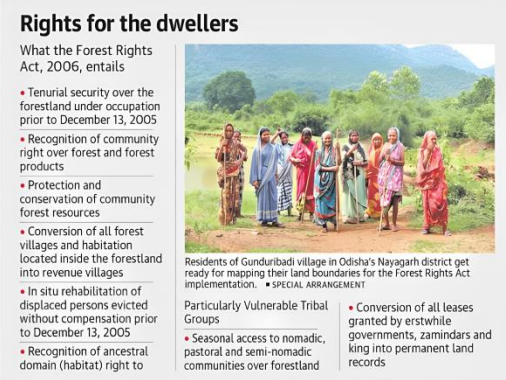
80.Forest rights of tribal people were not settled for Nicobar project: council

Paper: GS - III, **Subject:** Environment and Ecology**, Issue:** The Great Nicobar Project

Context

Great Nicobar Project & Tribal Rights

- **₹72,000 crore project (launched 2021):** port, airport, township, 450 MW plant.
- **Strategic location:** equidistant from Sri Lanka, Malaysia, Singapore.
- **Issue:** Andaman & Nicobar administration falsely claimed tribal rights under FRA, 2006, were "settled."
- Forest clearance given without due process.
- **Concern:** Rights of PVTGs like **Shompen** not recognized → violation of FRA



Forest Rights Act (FRA), 2006

- Aims to undo historical injustice to Scheduled Tribes (STs) and Other Traditional Forest Dwellers (OTFDs).
- Empowers Gram Sabhas, protects against eviction, and recognizes both individual and community rights.

Key Provisions:

- Recognizes individual and community rights over forest land, including rights to hold, live, and use forest resources.
- Mandates Gram Sabha consent for any diversion of forest land for non-forest purposes (e.g., infrastructure projects).
- Requires the settlement of forest rights before granting forest clearances under the Forest Conservation Rules, 2017.
- Protects the cultural and livelihood rights of forest-dwelling communities, especially PVTGs like the Shompen.

Forest Rights Act (FRA), 2006 Key Provisions

1. Recognition of Rights-for FDSTs and OTFDs (residing 3 generations/75 years).

2. **Types of Rights**
   - *Individual:* habitation, cultivation (max 4 ha), minor forest produce.
   - *Community:* grazing, fishing, habitat rights, customary territories.
   - *Development:* schools, health, roads, electricity on forest land.

3. **Gram Sabha Empowerment** – central role in verifying and approving claims.

4.**Protection from Eviction** – until rights are recognized.

5.**Conservation Duties** – biodiversity, wildlife, ecological balance.
6.**Limitations** – no rights for land occupied after 13 Dec 2005.

Challenges in Implementation

- **High Rejection Rates:** poor documentation, lack of awareness.
- **Weak Institutions:** irregular committees, pending claims.
- **Neglect of Community Rights:** focus on individual titles only.
- **Opposition from Forest Dept. & conservation lobbies.**
- **Procedural Lapses:** wrongful rejections, violations of FRA guidelines.

Lessons from Success

- FRA empowered communities → improved conservation, sustainable livelihoods.
- Community Forest Resource Committees ensured transparent governance.

Suggestions for Improvement

Use GPS-based surveys to correct errors.
Cancel wrongly granted rights in ecologically sensitive areas.
Make Forest Department accountable for implementation.
Fix deadlines for claims, evict ineligible occupants.
Promote community-based protection, afforestation, and technical support for livelihoods + conservation.

81. NARI Index 2025: Mapping Women's Safety

Category: Governance & Social Justice | GS Paper II

What is in the News?
The National Annual Report and Index on Women's Safety (NARI 2025) by NCW revealed that India's national safety score is 65 percent.

Key Findings
• Safest cities: Kohima, Visakhapatnam, Bhubaneswar, Aizawl, Gangtok, Itanagar, Mumbai. • Lowest-ranked: Patna, Jaipur, Faridabad, Delhi, Kolkata, Srinagar, Ranchi. • 6 in 10 women feel safe; 40 percent feel unsafe. • Night-time safety poor in transport and recreation.

Harassment Data (2024)
• 7 percent of women faced harassment; young women under 24 at 14 percent risk. • Most common form: verbal harassment (58 percent). • Hotspots: neighbourhoods (38 percent), transport (29 percent).

Institutional Weaknesses
• Only 1 in 3 victims filed complaints; action in just 16 percent. • 53 percent of working women unaware of POSH policy. • Educational spaces relatively safe in daylight but unsafe at night.

Policy Context
• POSH Act 2013, Safe City projects, Nirbhaya Fund. • Need for gender-sensitive policing, urban design, and awareness.

Relevance for UPSC
• **GS II:** Women's empowerment, social justice, governance reforms. • **GS I:** Issues of urbanisation and gender. • **Essay:** Women's empowerment and inclusive development.

PYQs and Linkages
• GS II (2021): Women's safety as an aspect of inclusive urban development. • Essay (2015): Women's empowerment as nation-building.

Conclusion
Despite progress, women's lived insecurity remains stark. Institutional responsiveness and gender-friendly infrastructure are essential for genuine empowerment.

82. Pratibha Setu Portal: Opportunity Beyond UPSC

Category: Governance & Human Capital | GS Paper II

What is in the News?
The Government has launched Pratibha Setu, a digital platform for UPSC aspirants who cleared all stages but missed the final merit list.

Key Features
• Database of over 10,000 capable candidates from civil, engineering, and medical backgrounds. • Private companies can recruit from this talent pool. • Hundreds of aspirants have already secured jobs through the portal.

Significance
• Utilises the skills of UPSC aspirants for nation-building. • Encourages private participation in tapping human capital. • Provides dignity and opportunities beyond the exam system.

Policy Context
Aligned with Skill India, Startup India, and SDG 8 on Decent Work and Growth.

UPSC Keywords
Pratibha Setu, Human Capital, Governance Innovation, Talent Utilisation.

PYQs and Linkages
• GS II (2019): Harnessing India's human capital. • Essay (2022): Education without employment breeds frustration.

Conclusion
Pratibha Setu is an example of governance innovation ensuring talent is channelised productively.

83. Mahatma Ayyankali: Social Justice Crusader

Category: Social Reformers & Society | GS Paper I & II

What is in the News?
Mahatma Ayyankali (1863–1914), Kerala's pioneering social reformer, fought for Dalit rights and equality.

Contributions
• Founded Sadhu Jana Paripalana Sangham (SJPS) to organise Dalits. • Championed Dalits' right to walk on public roads and access education. • Inspired constitutional safeguards like abolition of untouchability and reservations.

Legacy
• Precursor to Ambedkar's social justice vision. • Strengthened Kerala's tradition of reform alongside Sree Narayana Guru.

UPSC Keywords
Ayyankali, Dalit Reform Movements, Kerala Renaissance, Social Justice.

PYQs and Linkages
• GS I (2019): Reform movements in India as foundations for democracy. • GS I (2017): Role of social reformers in inclusiveness.

Conclusion
Ayyankali's reformist struggle remains central to India's constitutional vision of equality and dignity.

84. Nuakhai Festival: Odisha's Agrarian Celebration

Category: Indian Society & Culture | GS Paper I

What is in the News?
Nuakhai, the annual harvest festival of Western Odisha, was celebrated on 28 August 2025, a day after Ganesh Chaturthi.

Key Features
• Celebrates the first consumption of new rice crop. • Most significant cultural festival of Western Odisha; also observed in Jharkhand and Chhattisgarh.

Cultural Significance
• Reinforces agrarian community bonds. • Reflects regional identity and cultural pride. • Symbol of India's unity in diversity.

UPSC Keywords
Nuakhai, Harvest Festivals, Agrarian Culture, Regional Identity.

PYQs and Linkages
• GS I (2020): Regional festivals as socio-economic institutions. • Essay: Culture as the widening of the mind.

Conclusion
Nuakhai highlights India's agrarian traditions and cultural vibrancy, strengthening social cohesion.

85. What is SIR (Special Intensive Revision)

SIR (Special Intensive Revision) is a comprehensive, door-to-door verification of electoral rolls conducted by the Election Commission of India (ECI). Its aim is to remove ineligible and duplicate voters and ensure only genuine citizens aged 18+ are included in the voter list, especially in states with migration and demographic concerns like Bihar

Legal and Constitutional Backing

- Constitutional Foundations:
- Article 324: Grants superintendence, direction, and control over elections to the ECI.
- Article 326: Guarantees universal adult suffrage for all citizens aged 18+ except those disqualified under specific conditions.
- Statutory Law:
- Section 21, Representation of the People Act, 1950 (RPA): Authorizes the ECI to prepare and revise electoral rolls, including special revisions for recorded reasons.
- Section 16, RPA: Specifies disqualifications for registration as a voter (like non-citizenship, unsound mind, corruption convictions).
- The ECI justifies SIR through these provisions, stating its mandate to keep the rolls clean and accurate

Need for SIR

Several factors underline the necessity of SIR:

- Frequent demographic changes due to urbanization and migration.
- Concerns over illegal immigration, particularly in border regions.
- Past experiences with fraudulent or duplicate registrations.

Criticisms and Challenges: Special Intensive Revision (SIR) 2025

Documentation Hurdles

- From June 24–July 25, 2025, all Bihar voters had to submit enumeration forms and extensive supporting documents, especially those enrolled after January 2003 (requiring proof of their and their parents' date/place of birth).
- This strict process risks excluding poor, homeless, migrant, and elderly voters who lack paperwork, causing confusion and fears of disenfranchisement.

Legal and Procedural Concerns

- The Election Commission is using its discretionary powers under the Representation of the People Act, but SIR procedures are not precisely defined, raising controversy over the extent of its authority.

Administrative and Logistical Strain

- Intensive door-to-door verification by Booth Level Officers across over eight crore electors in Bihar has been challenging, risking inaccuracies and omissions.
- As of August 24, 2025, documentation for 98.2% of electors had been collected, but about 1.8% still needed to submit papers.

86. Skill check

Paper: GS - II, **Subject:** Society and Social Justice**,** Topic**:** Social Sector- Education, **Issue:** Enhancing skills through vocational education.

Context

Rising demand-driven growth and global uncertainties require boosting domestic consumption and employment. Vocational Education and Training (VET) is crucial for enhancing productivity, employability, and preparing workforce for the future of work.

- It is overseen by the **Ministry of Skill Development and Entrepreneurship (MSDE)** and regulated by the **National Council for Vocational Education and Training (NCVET)**.

Vocational education refers to education and training that equips individuals with specific skills for a particular trade, occupation, or craft. It focuses on practical and hands-on learning, aiming to make students directly employable in industries such as manufacturing, healthcare, IT, hospitality, etc.

Current Status of Vocational Education in India

- Skilled Workforce: Only 4% of India's workforce is formally trained in VET.
- Institutional Network: Over 14,000 ITIs with 25 lakh sanctioned seats.
- Low Enrollment: Only 12 lakh enrolled in 2022, reflecting 48% seat utilization.
- Low Uptake: Weak industry-job market linkage and poor employment outcomes reduce VET appeal.
- No Academic Pathways: Lack of progression from VET to higher education limits participation.

Challenges in India's VET System

- Late Integration:
  VET generally starts post-high school, limiting early skill-building—unlike Germany's dual model where VET and apprenticeships begin at the upper-secondary level.
- Lack of Academic Pathways:
  No standardized progression from VET to higher education or credit transfer; discourages youth from enrolling due to fear of blocked academic mobility (unlike Singapore).
- Low Enrolment & Awareness:
  Only about 5–6% of youth formally enroll in VET, compared to over 50–60% in advanced economies.
- Social Stigma:
  VET is seen as second-rate—a "dead-end," making it unattractive to students and parents.
- Quality Issues & Outdated Curriculum:
  One-third of ITI instructor posts are vacant, and only ~15% have formal instructor training; surveys show just 43% of PMKVY-certified youth work in their trained domain.

Poor Monitoring & Feedback:

Global Comparisons:

- **Singapore**: Clear pathways from VET to higher education, industry-led curriculum, strong employer feedback, Skill Future Programme.
- **Public-Private Partnerships (PPPs):** Germany, Singapore, and Canada leverage PPPs, with governments funding institutions and employers supporting apprenticeships and curricula.