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CURRENT AFFAIRS

OCTOBER-2025

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DEFENCE & TECHNOLOGY (GS-3)

1.Tejas

Tejas (meaning "Radiance" in Sanskrit) is India's home-built fighter jet, designed to replace old planes like the MiG-21 in the Indian Air Force (IAF). Made by Hindustan Aeronautics Limited (HAL) and the Aeronautical Development Agency (ADA), it's a lightweight, high-tech jet used for air combat, bombing, and reconnaissance

What is Tejas?

- **What It Is**: Tejas is a small, single-engine fighter jet that can fight, drop bombs, and spy from the air. It's like a fast, armed bird for India's defense.
- **Why It Matters**: Started in 1983 to replace outdated MiG-21s, it's now flying with the IAF, with two squadrons active (40 jets) and more coming by 2026.
- **Key Features**: Flies at 1,975 km/h (Mach 1.6), carries missiles like Astra, has high-tech radar, and can operate in tough places like mountains or deserts.
- It's mostly made in India (70% parts local), saving money and showing India can build its own advanced weapons.

Variants of Tejas

- **Tejas Trainer**: A two-seater jet for training IAF pilots to fly and fight. It can still carry weapons, like a practice car that can race.
- **LCA Navy**: A special version for the Navy, built to take off and land on aircraft carriers. It comes in single-seat (one pilot) or twin-seat (two pilots) models.
- **LCA Tejas Navy Mk-2**: An upgraded Navy version under development, with better tech for sea missions. It's like a stronger ship-ready jet, expected by 2030.
- **LCA Tejas Mk-1A**: An improved version of the main jet with a more powerful engine, better radar, and missiles that hit far targets. It's easier to maintain and key for IAF's needs.

NOTE

The J-20, FC-31 (also known as J-31 or J-35), and J-35 are advanced Chinese fighter jets, with Pakistan reportedly acquiring the J-35 to counter regional developments like India's Rafale and Tejas.

2. Advanced Medium Combat Aircraft (AMCA): India's 5th-Generation Fighter

The **AMCA** is India's indigenous 5th-generation stealth fighter, designed to counter regional threats like China's J-20 and Pakistan's J-35, with Defence Minister Rajnath Singh approving a competitive execution model in March 2024. Developed by the Aeronautical Development Agency (ADA) and involving private players, it aims to boost self-reliance in defense aviation by 2034.

It is enabling competitive participation of both HAL and private sector players.

Overview of AMCA

- AMCA is a twin-engine, 25-tonne stealth fighter for air superiority and multirole missions. It features advanced radar, internal weapons bays, and supercruise capability.
- Approved by the Cabinet Committee on Security in March 2024 with ₹15,000 crore. First prototype is expected by 2028–29, with induction by 2034.

Key Features of AMCA

- Stealth design reduces radar detection; diverter less supersonic intake enhances performance. Carries 1,500 kg internal, 5,500 kg external payload, and 6,500 kg fuel.
- Equipped with AESA radar, sensor fusion, and fly-by-wire controls. Uses GE F-414 engine for Mk1; Safran co-developed engine for Mk2 by 2030.
- Multirole capabilities include air-to-air combat, bombing, and reconnaissance. Designed for high-altitude operations in regions like Ladakh.
- Advanced avionics with infrared search/track (IRST) and electronic warfare suite. Ensures superiority over 4.5-gen jets like Rafale and Su-30 MKI.

Execution Model

- Competitive bidding allows HAL and private firms (e.g., Tata, Mahindra) to participate. No default status for HAL, ensuring cost-effective production.
- ADA to issue Expression of Interest (EoI) for development partners in 2025. Private consortia can bid for airframe, avionics, and systems.
- Public-private partnership aims to produce 5 prototypes by 2029. HAL's Tejas experience complements private sector innovation.

3. India's Renewed Interest in Su-57 Fighter Jets

In a surprising turn, India which withdrew from the Fifth Generation Fighter Aircraft (FGFA) programme with Russia in 2018 citing performance issues in the Su-57 is now reconsidering the same aircraft.

The Indian Air Force (IAF) is examining a Russian proposal to procure and co-produce Su-57 fighter jets under the Make in India initiative.

Background: Why India Withdrew in 2018

- The original FGFA project faced technical and cost concerns.
- The Su-57's stealth performance, super-cruise engines (AL-41F1), and sensor systems were below expectations.
- Russia was reluctant to share key technologies with India.
- The cost had ballooned continuing the project would have cost about USD 35 billion for 127 aircraft.
- Limited Russian deployment and underwhelming performance in the Russia–Ukraine war later reinforced India's decision to walk away.

Why India Is Reconsidering in 2025

1. Operational Gaps Exposed by Operation Sindoor (2025):

- The IAF realised it needs a long-range strike platform after operational gaps were exposed in recent conflicts.
- The Su-57, even if not an ideal stealth jet, can serve immediate combat needs and support IAF modernization.

2. Regional Military Balance:

- Reports of China offering its J-31 stealth fighter to Pakistan have made New Delhi reconsider its air deterrence posture.
- The Su-57's ability to carry long-range, heavy missiles gives it an edge in beyond-visual-range (BVR) combat.

3. Weapons Capability:

- Equipped with R-37M air-to-air missiles (over 300 km range) and Kh-47M2 Kinzhal hypersonic missiles for precision strikes.
- Makes it a powerful long-range strike fighter rather than a conventional stealth platform.

The Current Proposal

- Procurement Plan:
- Two squadrons (36–40 jets) to be bought directly from Russia.
- 3–5 additional squadrons to be manufactured in India by Hindustan Aeronautics Ltd (HAL) at its Nashik facility.
- HAL–Sukhoi Partnership:
- Builds on earlier successes, such as the Su-30MKI and MiG series production in India.
- Russia has offered 100% technology transfer for local co-production of the Su-57E (export version).
- Parallel Projects:
- This deal will not affect India's indigenous Advanced Medium Combat Aircraft (AMCA) project, planned for induction by 2035.

- Su-57 is seen as a transitional, stopgap fighter to maintain air dominance until AMCA arrives.

Strategic Context

- The U.S. F-35 remains unavailable for India under Make in India collaboration.
- Russia remains open to joint production, making the Su-57 a politically and technically viable bridge option.
- The jet complements existing IAF fleets Rafale and Su-30MKI by filling the deep-strike and long-range engagement gap.

4. DRDO to extend Astra Mark 2 missile's range beyond 200km

Context: The Defence Research and Development Organisation (DRDO) is developing an extended-range variant of the Astra Mark 2 beyond-visual-range (BVR) air-to-air missile.

What is Astra Mark 2?

- Indigenous BVR (Beyond Visual Range) air-to-air missile, boosting the Indian Air Force's interception range.
- Builds on Astra Mark 1 legacy and supports India's self-reliance mission in advanced missile tech.

Core Features and Innovations

- Dual-Pulse Propulsion: Uses dual-pulse solid rocket motor for longer, sustained thrust compared to Mk-1.
- Operational Range & Speed: Can engage targets at 150–200+ km, achieving up to Mach 4.5.
- Advanced Guidance: Fitted with indigenous RF seeker and robust ECCM for precision even in contested zones.
- Operational Flexibility: Effective day/night, in adverse weather, with off-boresight and data-link targeting.
- Stealth Launch: Smokeless propellant reduces missile visibility on launch.

Integration and Collaboration

- Designed for Su-30 MKI, LCA Tejas, with plans for Rafale, AMCA, TEDBF jets.
- Developed with contributions from over 50 industry partners, including HAL and BDL.

Recent Developments

- Range pushed beyond initial 160 km; upcoming version enters the 200+ km class.
- India plans acquisition of 700+ Astra Mk-2 units for fighter fleet standardization.

Strategic Significance

- Matches capability with PL-15 (China) and AIM-120D AMRAAM (US), improving deterrence.
- Supports Atmanirbhar Bharat in missile autonomy, forms basis for Astra Mark 3 with advanced ramjet propulsion.

Astra Mark 2 is setting a new benchmark in indigenous air-to-air missile technology, securing India's skies with advanced homegrown systems.

5. India's Mission Sudarshan Chakra: Iron Dome-Like Defence System

Introduction

- Mission Sudarshan Chakra is India's plan to build a nationwide air defence shield by 2035.
- It aims to detect and destroy aerial threats while enabling counter-attacks.

Key Components

- **Radars and Sensors**: 6,000-7,000 radars track threats like missiles and drones up to 600 km.
- **Satellites**: Provide constant space-based surveillance for early threat detection.
- **Directed Energy Weapons (DEWs)**: Laser systems destroy drones and missiles cost-effectively.
- **Missile Interceptors**: Include QRSAM and VSHORADS for multi-layered threat neutralization.
- **Command & Control**: AI-driven center with 3D visualization for real-time decisions.

Project Kusha: Core Interceptor System

Project Kusha is an indigenous Indian air and missile defense system being developed by the Defence Research and Development Organisation (DRDO) to create a multi-layered shield against a wide range of aerial threats.

The project focuses on developing a series of long-range surface-to-air missiles with interception ranges of 150 km, 250 km, and 350–400 km, respectively, to counter threats like stealth fighters, drones, and ballistic missiles. The program is a key component of "Mission Sudarshan Chakra" and aims to enhance India's self-reliance in defense technology

- **Overview**: DRDO's long-range missile system (150-400 km) to counter stealth jets and missiles.
- **Variants**: M1 (150 km), M2 (250 km), M3 (350-400 km) for diverse threats.
- **Features**: AI targeting, 80-90% kill rate, naval variants; full induction by 2030.

A small beginning was made with DRDO's maiden test of an integrated air defence weapon system (IADWS) on Aug 23. It included quick reaction surface-to-air missiles (QRSAMS, with 30-km interception range), very short-range air defence system (VSHORADS, with 6-km range) missiles and a 30-kilowatt laser-based directed energy weapon (DEW, with 3.5-km range).

Two-Layer Anti-Ballistic Missile Defence System

- India's anti-ballistic missile (ABM) system comprises two layers: the Endo-Atmospheric and Exo-Atmospheric interceptors.
- Exo-Atmospheric Interceptor (AD-1/PDV): Destroys incoming ballistic missiles outside the atmosphere, at altitudes of 50–150 km.
- Endo-Atmospheric Interceptor (AD-2/AAD): Targets missiles within the atmosphere, at an altitude of 15–30 km.
- The combination of these two interceptors offers a layered shield capable of neutralizing incoming ballistic missile threats from neighboring adversaries.
- The system uses networked radars, command centres, and real-time data sharing for tracking and interception.

- Integrated with other national air defence and command structures for a cohesive security network.
- India has successfully tested both layers and is steadily moving towards deployment over key metro cities and strategic sites, further enhancing survivability against nuclear and conventional missile attacks.

The Akashteer system

The Akashteer system is an indigenously developed, automated air defense system for the Indian Army that integrates radars, sensors, and communication technologies to provide real-time, unified situational awareness and coordinated defense against aerial threats like drones, aircraft, and missiles. It is a vehicle-based, mobile framework designed to work with other military branches and provides a common, real-time air picture to lower operational units. Akashteer was designed to enhance coordination, automate threat engagement, and reduce the risk of friendly fire **detect, track, identify, and neutralize**

6. Indian Army Inducts Indigenous 'Saksham' Counter-UAS Grid for Battlefield Security

Overview

- On **October 9, 2025**, the Indian Army took a major leap in modern warfare by inducting **'Saksham' an indigenous Counter-Unmanned Aerial System (CUAS)** developed by **Bharat Electronics Limited (BEL), Ghaziabad**.
- Drones have changed the face of warfare from Ukraine to West Asia , turning skies into the newest battlefield. *Operation Sindoor* had already exposed India's vulnerability to low-flying drone intrusions. **Saksham is India's answer to that challenge.**

Why Saksham?

- The name itself means *"capable"*, and the system truly lives up to it.
  Saksham stands for **"Situational Awareness for Kinetic Soft and Hard Kill Assets Management"** in simpler terms, a **digital nerve centre** that spots, tracks, and neutralizes enemy drones before they can strike.
- Think of it as an **"Iron Dome" for low-altitude airspace**, guarding the skies up to **3,000 meters (10,000 feet)** above ground.

Key Features

- **Real-Time Threat Handling**: Detects, tracks, identifies, and neutralizes hostile drones/UAS instantly.
- **AI-Powered Analytics**: Real-time threat detection with predictive analysis for faster decisions.
- **Integrated Response**: Combines sensors (e.g., radars) and weapons (soft/hard kill options) for synchronized action.
- **Visual Tools**: 3D battlefield visualization and automated decision support.
- **Interoperability**: Works seamlessly with other systems, including **Akashteer** (air defense tool) for mapping friendly/neutral/hostile airspace users.
- **Integrated Picture**: Creates a **Recognised UAS Picture (RUASP)** by fusing sensor data, counter-drone tech, and AI insights for commanders.

Why It Matters

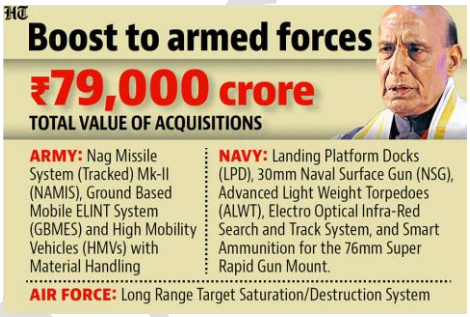
- **Redefines Air Defense:** It expands protection beyond the ground into the *Air Littoral*, where most tactical drones operate.
- **Faster Reactions:** Real-time analytics mean decisions are taken in **seconds, not minutes**.
- **Self-Reliance in Action:** 100% indigenous aligning with **Atmanirbhar Bharat** and the Army's **Decade of Transformation (2023–2032)**.
- **Digital Battlefield Ready:** Strengthens India's ability to fight in **network-centric, AI-driven battle environments**.

In Essence: "Saksham is not just a radar or jammer but it's India's new battlefield brain, one that watches the skies, learns from every threat, and reacts faster than the enemy can blink."With Saksham, India moves a step closer to building a **digitally networked, self-reliant military** ready for the wars of tomorrow.

7. Defense procurement cleared by the Defence Acquisition Council (DAC):

The **Defence Acquisition Council (DAC)** approved procurement proposals worth **₹79,000 crore** to modernise all three-armed forces Army, Navy, and Air Force under the **Aatmanirbhar Bharat** initiative.

The DAC approved multiple indigenous-focused procurements to enhance tri-service capabilities, emphasizing anti-tank warfare, surveillance, amphibious ops, and autonomous systems.



Indian Army

- **Nag Missile System (Tracked) Mark-II**: Anti-tank guided missile for destroying enemy tanks, bunkers, and fortifications. Developed by DRDO; enhances mobile strike power.
- **Ground-Based Mobile Electronic Intelligence System**: For real-time monitoring of enemy signal emissions and electronic warfare; Boost's battlefield intelligence.
- **High Mobility Vehicles with Material Handling Cranes**: For logistics, rapid movement of heavy equipment in rugged terrains.; Improves supply chain in challenging borders.

Indian Navy

- **Landing Platform Docks (LPDs)**: Multi-role amphibious assault ships for troop/vehicle transport, supporting joint ops with Army/Air Force, peacekeeping, and disaster relief. *It* Enables large-scale landings; aligns with blue-water Navy goals.
- **30-mm Naval Surface Guns**: For anti-piracy, low-intensity maritime ops; strengthens Navy and Coast Guard. *It* Enhances ship/coastal defense.
- **Advanced Lightweight Torpedoes**: DRDO-developed for engaging submarines (conventional/nuclear).; Key for undersea warfare dominance.
- **Electro-Optical Infrared Search and Track Systems**: For surveillance, target acquisition on warships.; Improves night/all-weather detection.
- **Smart Ammunition for 76-mm Super Rapid Gun Mount**: Precision-guided rounds for naval guns; Boost's accuracy in ship-based fire support.

Indian Air Force

- **Collaborative Long-Range Target Saturation and Destruction System**: Autonomous drone/UAV system for take-off, navigation, target ID, and payload delivery; Enables swarm attacks for deep strikes.

About the Defence Acquisition Council (DAC)

The DAC approved multiple indigenous-focused procurements to enhance tri-service capabilities, emphasizing anti-tank warfare, surveillance, amphibious ops, and autonomous systems.

- **Established:** 2001 (based on the Kargil Review Committee recommendations)
- **Chairperson:** Defence Minister of India

- **Role:** It is the **highest decision-making body in the Ministry of Defence** for capital procurement and policy approval.

Functions of DAC

1. Grants **Acceptance of Necessity (AoN)** for major acquisition proposals.
2. Categorises projects under "Buy," "Buy & Make," or "Make in India" production models.
3. Approves a **15-year Long-Term Integrated Perspective Plan (LTIPP)** for defence forces.
4. Ensures quick, transparent, and efficient procurement for capability building.

Promotes **indigenisation and self-reliance** under Aatmanirbhar Bharat by favouring Indian vendors

8.AstroSat: India's First Space Observatory (2015–2025)

AstroSat is India's first dedicated space observatory, launched by ISRO on September 28, 2015, to study stars, galaxies, and cosmic events. Celebrating a decade in 2025, it has surpassed its 5-year mission life, delivering groundbreaking discoveries.

Overview of AstroSat

- Launched via PSLV-C30 (XL) rocket from Sriharikota on September 28, 2015. India's first multi-wavelength telescope, like a smaller NASA Hubble.
- Designed for a 5-year mission but still operational in 2025. Observes universe in ultraviolet (UV), visible, and X-ray wavelengths.

Importance of AstroSat

- Marks India's entry into elite space observatory nations (USA, Europe, Japan). Boosts India's global standing in space science.
- Enables Indian scientists to study cosmic phenomena independently. Supports astrophysics research with 500+ global publications.

Major Achievements

- Studied black holes, neutron stars, and Proxima Centauri (nearest star). First Indian detection of far-ultraviolet photons from galaxies 9.3 billion light-years away.
- Provides simultaneous data across UV, visible, and X-ray spectra. Over 1,000 observations analyzed by 2025, aiding global research.

Payloads (Instruments) Onboard

- **UVIT (Ultra Violet Imaging Telescope)**: Captures UV and visible light images. Studies young stars, galaxies, and nebulae formation.
- **LAXPC (Large Area X-ray Proportional Counter)**: Detects low-energy X-rays. Observes binary star systems and black holes.
- **CZTI (Cadmium-Zinc-Telluride Imager)**: Measures high-energy X-rays. Detects gamma-ray bursts and cosmic explosions.
- **SXT (Soft X-ray Telescope)**: Captures soft X-rays. Analyzes supernovae and neutron star activities.
- **SSM (Scanning Sky Monitor)**: Monitors X-ray sky for sudden events. Tracks star explosions and transient phenomena.

Collaborative Effort

- Developed by ISRO with Inter-University Centre for Astronomy & Astrophysics (IUCAA). Involved Tata Institute of Fundamental Research (TIFR) and Indian Institute of Astrophysics (IIA).
- Included Raman Research Institute (RRI) and Indian universities. Supported by Canadian and UK institutes for payloads and data.

9. Zoho had bagged the approval to power National Informatics Centre's (NIC) email system

Indian software company, winning a government contract to power the email system for the National Informatics Centre (NIC), amid a push for "Swadeshi" (Indian-made) technology. This shift involves migrating from NIC's old email setup to Zoho's secure cloud platform, with over 1.5 million users already onboard. It's part of broader efforts to use local products for data security and reduce reliance on foreign tech, following a 2023 tender by the Ministry of Electronics and IT (MeitY).

What is Zoho?

- Zoho is an Indian technology company headquartered in Chennai.
- It offers a cloud-based office suite like Microsoft 365 and Google Workspace.
- Key applications include Zoho Mail (email), Zoho Writer (documents), Zoho Sheet (spreadsheets), and Zoho Show (presentations).
- The company represents India's growing domestic software industry under "Make in India" and "Digital India."

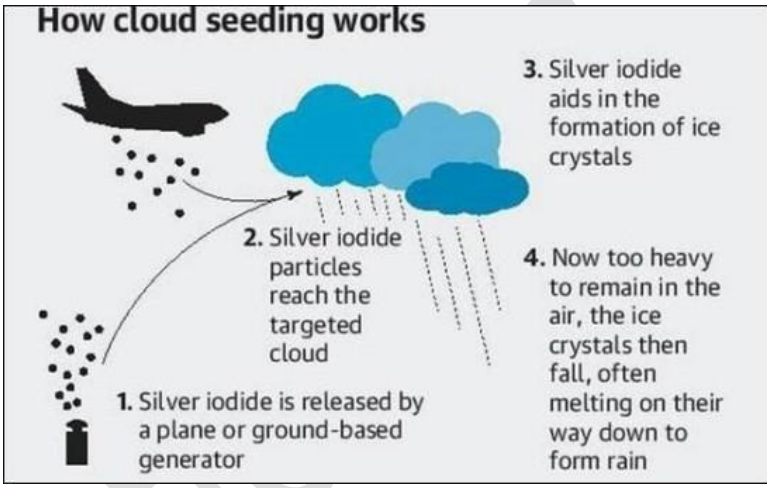
Need for Migration

- Data Security: Many officials were using third-party or open-source apps that posed data security risks.
- Digital Sovereignty: The switch to Zoho ensures that sensitive government data stays within India.
- Standardization: Zoho provides a uniform platform for document creation, collaboration, and communication.
- Swadeshi Movement: Using an indigenous product supports India's goal of becoming a self-reliant product nation.
- Strategic Independence: Reduces dependency on foreign software providers and enhances control over digital systems.
- Cost Efficiency: Using an Indian platform cuts down foreign licensing costs and strengthens the local tech ecosystem.

10. Artificial Rain

What is Artificial Rain (Cloud Seeding)?

- Cloud seeding is a **weather modification technique** to **stimulate rainfall** from existing clouds.
- Substances like **silver iodide**, **potassium iodide**, **salt**, or **dry ice (CO_2)** are released into the air using **planes, rockets, or drones.**
- These particles act as **nuclei**, attracting water vapour and causing it to condense into larger droplets that fall as rain.



How It Works:

- **Static Seeding**: Silver iodide mimics ice crystals, triggering freezing in supercooled clouds.
- **Dynamic Seeding**: Boost's updrafts to develop rain-bearing clouds.
- **Hygroscopic Seeding**: Salts attract moisture in warmer clouds to form larger droplets.

Applications: Used for drought relief, hail suppression, fog dispersal, or pollution washout (e.g., UAE for rain enhancement; India trials in Maharashtra for water scarcity).

How it Works in Delhi

- Delhi's government and IIT Kanpur conducted a **trial flight** where cloud-seeding flares were released over **Khekra, Burari, and Aligarh**.
- The goal was to create **artificial rainfall** that could wash away pollutants like **PM 2.5 and PM 10** from the atmosphere.
- This technique works only when there are **existing moisture-laden clouds** — not in clear or dry skies.
- It depends on **temperature, humidity, wind pattern, and cloud type.**

Expected Benefits

- When successful, rain can temporarily **reduce smog** by cleansing particulate pollutants and gases.
- Studies show cloud seeding can **increase rainfall by only 5–20%** under ideal conditions.
- Countries like **China, UAE, and USA** use it for **drought relief, agriculture, and fog clearing**.

Limitations

1. **Needs clouds – can't make clouds from dry air.**
2. **Temporary relief** – pollution levels can return within 1–2 days.
3. **Low success rate** – around **50–60%** at best, depending on moisture.
4. **Weather-sensitive** – works only if humidity is above 50%.
5. **Environmental risks** – chemicals like **silver iodide** may accumulate in soil and water.
6. **Expensive and resource-intensive** – one project in Delhi reportedly cost over ₹3 crore.

Delhi's Pollution Context

- Post-Diwali pollution surges due to **vehicle emissions, industrial activity, construction dust, and stubble burning**.
- Static winter air traps pollutants close to the ground, worsening smog.
- Rain can briefly improve visibility and AQI, but **won't solve the root problem**.

Conclusion

Cloud seeding can offer **short-term relief** by washing away pollutants, but it is **not a sustainable solution** for Delhi's air crisis. Permanent improvement requires **controlling emissions at the source** cleaner transport, crop management, and industrial regulation not weather-based experiments.

Q1. Artificial way of causing rainfall to reduce air pollution makes use of (PYQ)

(a) Silver iodide and Potassium iodide
(b) Silver nitrate and Potassium iodide
(c) Silver iodide and Potassium nitrate
(d) Silver nitrate and Potassium chloride

Answer: (A)

- Silver iodide (AgI) is used for *cold clouds* (below freezing) as its crystal structure mimics ice, acting as a nucleus for ice formation.
- Potassium iodide (KI) is used for *warmer clouds* that contain liquid water droplets, helping them coalesce and trigger rainfall.

11.The Rashtriya Vigyan Puraskar

The Rashtriya Vigyan Puraskar (RVP), launched in 2024, is India's premier science award, replacing fragmented honors like the Shanti Swarup Bhatnagar (SSB) awards. It recognizes excellence in four categories: Vigyan Ratna (lifetime), Vigyan Shri (recent), Vigyan Yuva-SSB (under 45), and Vigyan Team (group efforts).

Key Details:

- Objective: To honor outstanding scientists, technologists, and innovators , individuals or teams for breakthroughs across various scientific domains.
- Eligibility:
- Open to government, private sector, and independent scientists.
- Persons of Indian origin abroad contributing to India are also eligible.

Award Categories:

- Vigyan Ratna (VR): Lifetime achievement in science and technology.
- Vigyan Shri (VS): Distinguished contributions in any scientific field.
- Vigyan Yuva–Shanti Swarup Bhatnagar (VY-SSB): For scientists under 45 years with exceptional work.
- Vigyan Team (VT): For teams (3 or more members) with remarkable collaborative contributions.

Domains Covered:

Physics, Chemistry, Biological Sciences, Mathematics & Computer Science, Earth Science, Medicine, Engineering, Agricultural Science, Environmental Science, Technology & Innovation, Atomic Energy, Space Science & Technology, and Others.

Features

- **Categories**: Honors lifetime achievements (Vigyan Ratna), recent contributions (Vigyan Shri), young talent (Yuva-SSB), and team innovations (Vigyan Team).
- **Cap**: Limited to 56 awards annually, though numbers vary (24 in 2025).
- **Selection Process**: Managed by the **Rashtriya Vigyan Puraskar Committee**, chaired by the Principal Scientific Adviser (PSA), including ministry secretaries and scientific academy members.

Selection Committee Recommends To?

- The **Rashtriya Vigyan Puraskar Committee** recommends the list of awardees to the **Minister of Science and Technology** for final approval. However, it is not explicitly clear if the Minister can override these recommendations, raising concerns about potential political influence.

Editorial Stand: A "Hands-Off" Approach

- Government should avoid direct involvement in selecting scientists.
- Scientific excellence should be judged only by scientists and experts, not bureaucrats or politicians.
- Centralising the process may undermine scientific autonomy and credibility.
- True prestige comes from independent and merit-based recognition, not administrative control.

HEALTH & MEDICINE (GS-2 / GS-3)

12. Killer Cough Syrup Case

Incident: 24 child deaths in Madhya Pradesh due to **diethylene glycol (DEG)** contamination in *Coldrif* cough syrup by **Sresan Pharma (Tamil Nadu)**.

Accountability

Entity	Role & Failures
Manufacturer (Sresan Pharma)	Used **non-pharma grade propylene glycol**, violating quality norms; 39 critical & 325 major non-compliances.
State Governments (TN & MP)	TN failed to monitor plant; MP failed early sampling & oversight in distribution.
Central Govt / CDSCO	No inspection for 6 years; weak coordination and audit enforcement.

Relevant Legal Provisions

- **Drugs & Cosmetics Act, 1940:**
  - ✓ *Sec. 17, 18, 27, 27A* – Adulteration, prohibition, penalties (up to life imprisonment).
  - ✓ *Schedule M* – Good manufacturing practices violated.
- **Bharatiya Nyaya Sanhita, 2023:**
  - ✓ *Sec. 105* – Culpable homicide (death due to negligence).
  - ✓ *Sec. 276* – Adulteration of drugs causing death/harm.

Key Lessons

- Strengthen **inspection frequency (every 3 years)** and **joint audits** under CDSCO.
- Enhance **state–centre coordination** for licensing and recalls.
- Make **annual audits mandatory** to prevent recurrence of DEG-type tragedies.

13. Armed Forces (Special Powers) Act (AFSPA):

The Armed Forces (Special Powers) Act, 1958, grants the military special powers in troubled areas to maintain order, but is criticized as "draconian" for enabling human rights abuses.

- The Ministry of Home Affairs extended AFSPA in parts of Manipur (excluding 13 police station jurisdictions), Nagaland (nine districts), Arunachal Pradesh (select areas), and three districts of Assam for six more months from October 2025 due to ongoing security concerns and sporadic extremist incidents.

Context of AFSPA

- **Origins and Evolution**: Began as a 1948 law, modeled on British 1942 rules to curb Quit India protests. Updated in 1958 to tackle Assam and Manipur insurgency, later extended to other states.
- **Current Scope**: **Applies to parts of Assam, Nagaland, Manipur, and Arunachal Pradesh**. Revoked from Tripura (2015) and Meghalaya (2018) after improved security.
- **Declaration Power**: 1972 amendment allows Centre or states to declare "disturbed areas." Security reviews determine revocation or extension, as in 2025 Naga talks.

Features of AFSPA

- **Disturbed Area Declaration**: Section 3 allows Centre/states to designate areas with unrest as "disturbed." Military powers apply only in these zones, like Manipur's Imphal.
- **Use of Lethal Force**: Section 4(a) permits soldiers to use force, even causing death, on suspicion. Aimed at stopping insurgency or public disorder.
- **Arrest Without Warrant**: Section 4(c) allows arrests based on suspicion alone. Soldiers can detain anyone believed to threaten security.
- **Search Without Warrant**: Section 4(d) permits searching homes or premises without approval. Used to seize weapons or stop illegal activities.
- **Immunity From Prosecution**: Section 6 protects soldiers from legal action without Centre's sanction. Shields forces but blocks victim justice.

Criticisms of AFSPA

- **Excessive Powers**: Sections 4(a), 4(c), 4(d) give even junior officers unchecked lethal authority. Over 1,500 abuse cases reported since 1990 in Northeast.
- **Human Rights Violations**: Alleged fake encounters, torture, and sexual violence fuel unrest. Manipur's 2004 protests highlighted custodial deaths and abuses.
- **Lack of Accountability**: Section 6's immunity clause prevents prosecution without approval. Victims in Nagaland struggle for justice, increasing distrust.
- **Indefinite Imposition**: Prolonged use (60+ years in Nagaland) normalizes emergency conditions. Alienates locals, pushing youth toward militancy.

- **Undermines Democracy**: Called "draconian" by activists for curbing freedoms. Disrupts normal life, as seen in 2025 Ladakh protest concerns.
- **Fuels Insurgency**: Excessive force breeds resentment, worsening unrest. 20% rise in Naga militancy linked to AFSPA since 2010.

Supreme Court Views (1998 - Naga People's Movement v. Union of India)

- **Constitutionality Upheld**: AFSPA deemed legal for national security in disturbed areas. Balances Article 21 (life) with insurgency threats.
- **State Consultation**: Centre must consult states before declaring disturbed areas. Ensures local input on security conditions, per 1998 ruling.
- **Periodic Review**: Disturbed area status to be reviewed every 6 months. Checks if AFSPA remains necessary, as mandated by court.
- **Minimal Force**: Soldiers must use only necessary force to avoid harm. Excessive use subject to judicial scrutiny, per 1998 guidelines.
- **Judicial Oversight**: Courts can review misuse of AFSPA powers. Allows intervention if rights are violated, as in Manipur cases.

Expert Committees and Commissions

- **Jeevan Reddy Committee (2005)**: Recommended repealing AFSPA due to abuses. Suggested merging powers into UAPA for balanced security.
- **Grievance Cells**: Proposed district-level complaint offices for accountability. Not implemented, despite 2005 report's urgency.
- **Second ARC (2007)**: Urged scrapping AFSPA for human rights concerns. Highlighted alienation risks in Northeast, ignored by government.
- **Santosh Hegde Committee (2013)**: Probed Manipur fake encounters, found 6 illegal cases. Called for stricter AFSPA oversight and reforms.
- **UN Rapporteur (2012)**: Criticized AFSPA as a human rights violation. Urged India to repeal or align with global standards like ICCPR.

14.Criminal defamation

In **September 2025**, a Supreme Court Bench led by **Justice M.M. Sundresh** expressed concern over the **misuse of criminal defamation**, suggesting it may be time to **decriminalise** it. The case involved *The Wire* and a JNU professor, amid numerous defamation suits by politicians and private individuals.

What is Defamation?

Making or publishing **false statements** (spoken, written, or visual) that **harm reputation**.

Key Elements:

- **Identifiable Target:** Person or group is clearly identifiable.
- **Harm to Reputation:** Lowers esteem, credibility, or moral character.
- **Falsehood:** The statement must be false.
- **Intent:** Harmful intent or reckless disregard (though not always required).

Forms:

- **Libel:** Written or permanent form (articles, posts).
- **Slander:** Spoken statements.

Subjectivity:

Context matters irony or satire can still be defamatory.

Under **Section 356 of the Bharatiya Nyaya Sanhita (BNS), 2023** (earlier **Section 499 IPC**), criminal defamation carries **up to 2 years' imprisonment, fine, or both**.

Legal Framework in India

Under IPC/BNS:

- **Section 499 IPC / 356 BNS:** Defines defamation and exceptions (truth for public good, fair comment, judicial reports).
- **Section 500 IPC / 356 BNS:** Punishment up to **2 years' imprisonment, fine, or both**, with community service added under BNS.

Civil vs. Criminal Defamation:

- **Civil:** Private wrong; damages or injunctions (e.g., *Jaitley vs. Kejriwal*, ₹10 crore).
- **Criminal:** Public offense requiring intent; truth must serve public good; entails possible jail time.

Constitutional Link:

- **Article 19(1)(a):** Freedom of speech.
- **Article 19(2):** Allows restriction for defamation.
- **Article 21:** Protects reputation as part of life and dignity (*Subramanian Swamy v. Union of India*, 2016).

Arguments for Decriminalization

- **Suppression of Free Speech:** Over **1,200 cases in 2023** (NCRB); often target journalists and critics, creating a chilling effect.
- **Excessive Punishment:** Jail for speech is disproportionate; civil remedies suffice. UK decriminalized in 2009.
- **Political Misuse:** Politicians frequently weaponize the law (e.g., multiple cases by Nitin Gadkari; Rahul Gandhi summons).
- **Global Norms: UNHRC** deems imprisonment "never appropriate." Democracies like the UK and Canada rely solely on civil laws.
- **Judicial Overreach:** Lower courts issue summons in most cases without merit checks; burdens media and dissenters.
- **Civil Alternatives Effective:** Civil damages and retractions work without intimidation; even the **Law Commission (2024)** acknowledged misuse but suggested procedural reforms, not repeal.

Landmark Judgement: Subramanian Swamy v. Union of India (2016)

- The Supreme Court **upheld criminal defamation**, terming it a **reasonable restriction** on free speech under **Article 19(2)**.
- It linked **reputation to Article 21**, balancing dignity and free speech.
- Held that **one's reputation cannot be sacrificed for another's freedom of expression**.

Mobashar Jawed Akbar v. Priya Ramani (2021)

- **Issue:** Akbar sued Ramani for defamation over sexual harassment allegations.
- **Ruling:** Ramani acquitted; her statements were **true and in public interest**, exposing misuse of defamation to silence women.

Johnny Depp v. Amber Heard (2022, USA)

- **Issue:** Depp sued Heard over a 2018 op-ed implying domestic abuse.
- **Outcome:** Jury awarded **$10 million to Depp**, reigniting global debates on balancing reputation and free speech.

Law Commission (2024) Report

- **285th Report** recommended **retaining criminal defamation** with **faster trial mechanisms**, citing a **15% rise in misinformation (2020–23)**.
- However, it acknowledged misuse and the need for **balanced reform**, not blanket retention.

15.The National Security Act (NSA), 1980

The National Security Act (NSA), 1980 is India's stringent preventive detention law, allowing governments to detain individuals without trial for up to 12 months to prevent threats to national security or public order. It has been invoked against Sonam Wangchuk, Ladakh's climate activist, amid 2025 protests for statehood and Sixth Schedule protections

What is the National Security Act (NSA)?

- **Purpose**: Enables **pre-emptive detention** to stop acts "prejudicial to India's defense, foreign relations, security, public order, or essential supplies" (Section 3).
- **Key Features**:
- ✓ **No Trial Needed**: Detention is preventive (not punitive), without formal charges or open evidence.
- ✓ **Who Can Invoke**: Central/State governments, District Magistrates, or Police Commissioners (when authorized)?
- ✓ **Duration**: Up to **12 months**; can be extended but reviewed periodically.
- **Historical Context**: Roots in colonial Preventive Detention Act (1950); replaced MISA (1971, misused during Emergency). Enacted in 1980 for security threats, with safeguards against abuse.
- **Scope**: Applies to individuals (e.g., separatists, gangsters, radicals); detention order executed like an arrest warrant.

Key Criticisms of the NSA (National Security Act)

Misuse and Arbitrary Application

- Used against non-security threats like protests and minor crimes, broadening "national security" [NCRB 2023].
- Example: Sonam Wangchuk (2025 Ladakh protests), Kafeel Khan (2020); 40% cases quashed on review.
- Civil liberty groups (PUCL) highlight political targeting of dissenters and activists.

Lack of Adequate Safeguards

- No guarantee of legal representation before Advisory Board; government may withhold facts [PUCL 2023].
- Example: Wangchuk's wife reported no access to the detention order.
- Only 60% get grounds for detention in 5 days; 20% face delayed reviews.

Chilling Effect on Free Speech

- Used to silence protests and criticism, curbing Article 19(1)(a) rights.
- Example: Anti-CAA protesters (2019–20), Chandrashekhar Azad (2017); many released after court review.
- 30% of NSA cases (2020–23) linked to protests or public speeches [Amnesty India].

Vague and Overbroad Provisions

- Terms like "prejudicial to public order" are subjective, enabling misuse.
- Example: SC (2012) struck down NSA use for black-marketing kerosene.
- 25% of 2023 cases pertain to non-security issues (HRW).

Prolonged Detention Without Trial

- Allows up to 12 months' detention without charges, undermining Article 21 (due process).
- Example: Amritpal Singh (2023) held for 8 months with no trial.
- Average detention ~6 months; 15% exceed 10 months (PUCL).

Judicial Oversight Limited

- Advisory Board reviews often delayed; courts act mostly in blatant misuse cases.
- Example: Kafeel Khan freed only after HC intervention; Wangchuk's case pending.
- Only 50% reviewed within 3 weeks; 10% face delays (2024 data).

16. Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act)

The **MMDR Act, 1957** is India's **primary legislation** governing the **exploration, mining, and development** of minerals other than minor and atomic minerals. It provides the legal framework for mineral classification, licensing, revenue, and environmental regulation.

Key Features

- **Scope:** Covers all major minerals (coal, iron ore, bauxite, etc.); excludes minor (sand, gravel) and atomic minerals.
- **Centre–State Roles:**
  - ✓ **Centre:** Frames policies, fixes royalties, and regulates major minerals.
  - ✓ **States:** Control minor minerals, issue leases, and collect royalties.
- **Auction-Based Allocation:** Since **2015**, mining and prospecting licenses must be allotted through **competitive auctions** (Sections 10B, 10BA).

- **Schedules:**
  - ✓ *First* – Specified major minerals (coal, lignite, atomic).
  - ✓ *Second* – Royalty rates.
  - ✓ *Third* – Dead rent.
  - ✓ *Fourth* – Notified minerals and payment rules.
- **Royalty & Dead Rent:** Royalty rates set by Centre; states collect and share revenue. *Dead rent* is paid even if mining doesn't occur.
- **DMF & NMET (2015):**
  - ✓ *District Mineral Foundation* funds local welfare in mining areas.
  - ✓ *National Mineral Exploration Trust* finances exploration via 2% royalty levy.
- **Private Sector Reforms:** Amendments (2021, 2023) removed end-use restrictions, allowing private exploration and mining.
- **Critical Minerals (2023):** Prioritised auction of key minerals like lithium and REEs; **zero customs duty** on 12 minerals (2025–26 Budget).
- **Environmental Safeguards:** Requires clearances, sustainable mining, and rehabilitation (Section 4A).
- **Offshore Mining:** Central control over marine minerals in territorial waters and continental shelf (Section 13A).
- **Protection of Tribal Areas:** Mining in Scheduled Areas needs community consent under Fifth and Sixth Schedules.

Classification

- **Major Minerals:** Coal, iron ore, bauxite, copper, gold, zinc, etc.
- **Minor Minerals:** Building stones, sand, clay fully under state control.

In essence:

The **MMDR Act, 1957** ensures **transparent, sustainable, and balanced mineral development** through **auction-based allocation, Centre–State coordination**, welfare funds (DMF/NMET), and a renewed focus on **critical minerals** for energy and strategic self-reliance.

PYQ

Q. Consider the following statements:

I. India has joined the Minerals Security Partnership as a member.

II. India is a resource-rich country in all the 30 critical minerals that it has identified.

III. The Parliament in 2023 has amended the Mines and Minerals (Development and Regulation) Act, 1957 empowering the Central Government to exclusively auction mining lease and composite license for certain critical minerals.

Which of the statements given above are correct?

[A] I and II only

[B] II and III only

[C] I and III only

[D] I, II and III

17. Public Order

The Supreme Court of India has repeatedly emphasized a clear distinction between "law and order" and "public order" in preventive detention cases under laws like the NSA, to prevent misuse against dissent. This stems from Article 21's guarantee of personal liberty, requiring detention only when ordinary criminal law fails. The NSA (Section 3) applies to acts "prejudicial to... the maintenance of public order,"

Law and Order:

- Refers to individual or localized breaches of law, such as minor crimes (e.g., assault, theft) or small-scale protests.
- Impacts specific persons or small groups without widespread societal ripple effects.
- Managed through routine policing under laws like the Indian Penal Code (IPC) or Bharatiya Nyaya Sanhita (BNS).
- Does not justify preventive detention under laws like the NSA, as it lacks broader societal threat.
- Example: A peaceful hunger strike or critical speech, even if it challenges authorities, remains a law and order issue.
- Supreme Court stance: Mere criminality or isolated incidents (e.g., "broken windows") do not warrant escalated measures unless they escalate significantly.

Public Order:

- Involves broader societal disruptions that disturb the "even tempo of community life," causing widespread fear or paralysis (e.g., riots, communal violence).
- Affects the public at large, disrupting normal functioning, such as through curfews or economic halts.
- Requires a higher threshold, with evidence of imminent, large-scale harm to justify preventive detention under the NSA.
- NSA (Section 3) applies only to acts "prejudicial to the maintenance of public order," demanding "subjective satisfaction" by authorities with clear evidence (*Yusuf Malik* case, 2023).
- Example: Organized mob violence or arson that destabilizes a city or region.
- Supreme Court stance: Authorities must distinguish from law and order; inability to manage routine crimes doesn't justify NSA use, protecting democratic dissent (*Arjun v. State of Maharashtra*, 2023)

18. Preventive Detention

Preventive detention means detaining someone without a trial because authorities believe they might commit a crime in the future, to protect public order, national security, or essential supplies. Unlike punishment after a conviction, it's about stopping something before it happens. It's a holdover from British colonial rule, written into India's Constitution, but often criticized as a tool that can be misused to silence people.

Constitutional Provisions

India's Constitution includes **Article 22** (under Fundamental Rights) to allow preventive detention while trying to protect personal freedom (Article 21: Right to Life and Liberty):

- ✓ **Article 22(1)**: If arrested, you must be told why and can hire a lawyer.
- ✓ **Article 22(2)**: You must be brought to a judge within 24 hours; no detention without a judge's order.
- ✓ **Article 22(3)**: For preventive detention, you don't get immediate reasons if it risks security, no lawyer during inquiries, and some details can be hidden.
- ✓ **Article 22(4)**: You can't be held over 3 months unless an Advisory Board (made of judges) agrees.
- ✓ **Article 22(5)**: You must get the reasons for detention quickly and a chance to argue against it.
- ✓ **Article 22(6)**: Some facts can be kept secret if sharing them harms the public.
- ✓ **Article 22(7)**: Parliament can make laws allowing longer detentions or skipping Advisory Board reviews, like the National Security Act (NSA) allowing up to 12 months.

Laws Involved:

- Central laws: NSA (1980, up to 12 months), COFEPOSA (1974, for smuggling), UAPA (1967, for terrorism).
- State laws: Like Kerala's KAAPA or Tamil Nadu's GOAP.
- Parliament handles security; states handle public order and supplies.

Historical Usage

Preventive detention started with the British to control India and continued after independence, often used too freely during troubled times:

Colonial Times:

- **1818 Bengal Regulation**: Locked up suspected threats without trial to protect British rule.
- **1919 Rowlatt Act**: Allowed 2-year detentions for anti-British talk; led to protests and Jallianwala Bagh massacre.
- **1915/1939 Defence of India Act**: Used during World Wars to detain ~100,000 freedom fighters, like Gandhi and Nehru.

After Independence:

- **1950 Preventive Detention Act**: Meant to be temporary, lasted till 1969; detained ~50,000 for "public order" issues.
- **1971 MISA**: During the 1975-77 Emergency, ~110,000 people, including opposition leaders, were detained.
- **1980 NSA**: Replaced MISA; used in 1980s Punjab (thousands detained) and after 9/11 for terrorism.
- **Recent Use**: In 2019, ~4,000 detained in Kashmir after Article 370 was removed; ~10,000-15,000 detained yearly (2023-25) for protests or minor issues.

Criticisms

Preventive detention is seen as unfair and against democratic values, especially when used against regular people or critics:

- It's based on the government's guess about future crimes, which can be unfair and vague.

- It skips basic rights like a fair trial or being presumed innocent, ignoring protections in Articles 14 (equality) and 19 (freedoms).
- It's a British-era tool that doesn't fit a free country; India is rare for having it in its Constitution.
- It's often used against poor people, Scheduled Castes/Tribes (~70% in some areas), or activists, like in Kashmir.
- Advisory Boards often just agree with the government, and delays in giving reasons violate rules.
- It goes against global human rights laws (like UN's ICCPR) and can lead to torture or mental harm.
- Courts cancel ~80% of detentions for mistakes, showing it's often used wrongly.

Key Court Judgments

India's Supreme Court has tried to limit misuse of preventive detention, balancing security with freedom:

- **A.K. Gopalan v. State of Madras (1950)**: Said detention only needs to follow Article 22, not other rights like free speech or fair trial; seen as too strict.
- **Maneka Gandhi v. Union of India (1978)**: Ruled that laws must be fair and reasonable, influencing detention cases indirectly by demanding better process.
- **ADM Jabalpur v. Shivkant Shukla (1976)**: Allowed unchecked detentions during Emergency; later overturned in 2017 as a low point.
- **A.K. Roy v. Union of India (1982)**: Upheld NSA but said Advisory Boards must be independent; still kept detention separate from other rights.
- **S.K. Nazneen v. State of Telangana (2023)**: Ruled detention is only for serious "public order" threats, not minor "law and order" issues.
- **Jasleela Shaji v. Union of India (2024)**: Ordered release if reasons or translations are delayed, protecting detainee rights.
- **Dhanya M. v. State of Kerala (2025)**: Said detention is an extreme step, only for major threats, and can't replace prosecution or bail.

Key **viewpoints on Preventive Detention**:

Source / Thinker	Core Viewpoint	Key Recommendations / Concerns
Granville Austin (Historian)	Overuse of detention is unfair and weakens democracy.	Use only in rare cases (e.g., to protect witnesses); excessive use breeds lazy policing and undermines justice.
NCRWC (2002 Report)	Preventive detention must be time-bound and transparent.	Limit to **6 months**; avoid for minor/economic offences; strengthen **Advisory Boards**; ensure **annual reporting**; compensate wrongful detentions.
Krishna Ananth (Historian)	Preventive detention is a **colonial legacy** incompatible with democracy.	Repeal **Article 22**; earlier reforms (1978) were ineffective.
Faisal C.K. (Author, 2025)	Article 22 is a **"black hole"** swallowing liberty and fair trial rights.	Restrict to **grave threats** (terrorism, drug cartels); update old rulings to match **modern rights standards**.
Law Commission (1977)	Retain detention only with **strict judicial oversight**.	Limit to **3 months** unless essential; include **judges** in boards; ban vague grounds; follow **global human-rights norms**.
UN / Amnesty International	Preventive detention violates **international human-rights law**.	Use only when **no alternative** exists; must not silence dissent or curb free speech and protest.

19. PM-KUSUM Scheme

Context:

- Deadline likely to be extended again beyond **March 2026** (earlier March 2022) due to <50% progress in key components.
- **Component A** (~6.5%) and **Component C** (16–25%) lag behind; **Component B** achieved ~71%.
- States like **Karnataka**, **Rajasthan**, and **Maharashtra** are expediting work (e.g. feeder solarisation, power tax funding).
- **MNRE** reviewing financial viability; India to expand KUSUM to **Africa & Small Island States** via **ISA,** announced ahead of the 8th ISA Assembly in New Delhi

About PM-KUSUM

- **Full form:** *Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan*
- **Launched:** 2019 by the **Ministry of New and Renewable Energy (MNRE)**
- **Total outlay:** ₹34,422 crore (Central share ~ ₹10,000 crore)
- **Target:** 34,800 MW solar capacity (revised) by 2026

Objectives

- **Enhance energy security** for farmers by providing reliable solar power for irrigation.
- **Reduce dependence on subsidised diesel/electricity** for agriculture.
- **Promote decentralised solar power generation** and income diversification for farmers.
- **Reduce CO_2 emissions** and contribute to India's *Nationally Determined Contribution (NDC)* under the Paris Agreement.

Component	Description	Progress (2025)
A	Setting up **small solar power plants (up to 2 MW)** on barren/fallow land near substations to sell power to DISCOMs.	~6.5 % target achieved
B	Installation of **off-grid standalone solar pumps** (up to 7.5 HP) for irrigation.	~71 % achieved
C (i)	**Solarisation of existing grid-connected pumps** – individual farmer model (IPS).	~16.5 % achieved
C (ii)	**Feeder-level solarisation (FLS)** – supply clean power to entire agriculture feeder.	~25 % achieved

Challenges / Implementation Issues

1. **Land Acquisition & Transmission Bottlenecks** – difficulty in obtaining land near substations for Component A.
2. **Funding Constraints** – delayed subsidy release; some states like Maharashtra raised internal levies to finance state share.
3. **Low DISCOM participation** – due to poor financial health and fear of surplus power purchase.
4. **Awareness and Farmer Participation** – limited adoption in eastern and north-eastern states.
5. **Technical delays** – in feeder solarisation and tender processes.

20.Personality Rights

What Are Personality Rights?

- Personality rights protect a person's name, likeness, image, voice, signature, and public identity against unauthorised commercial exploitation.
- They are not codified in any single law but come from common law doctrines like privacy, defamation, and publicity rights.
- Courts may issue injunctions, damages, or takedown orders to stop the misuse of one's likeness in advertisements, products, or AI-generated content.

Major Legal Provisions

- **Copyright Act, 1957**
- *Section 38A* – gives performers exclusive rights over their performances.
- *Section 38B* – grants them moral rights to object to distortion or misuse.
- **Trade Marks Act, 1999**
- Allows registration of names, signatures, or catchphrases as trademarks.
- For example: Amitabh Bachchan, Shah Rukh Khan, and Priyanka Chopra have trademarked their names.
- **Common Law "Passing Off"** (Section 27, Trade Marks Act)
- Prevents false implication or misrepresentation that a product is linked to a celebrity.
- Requires proof of goodwill and reputation to get legal relief.
- **Criminal Defamation**
- **Article 21 – Right to Life and Privacy**
- Forms the constitutional foundation for personality rights.
- Protects an individual's control over their public image and dignity.

Key Court Cases

- **R. Rajagopal v. State of Tamil Nadu (1994)**: Supreme Court said privacy includes control over one's identity; non-consensual use is allowed only for public material.
- **Rajinikanth Case (Madras HC)**: Protected his identity without needing proof of public confusion.
- **Anil Kapoor Case (Delhi HC, 2023)**: Stopped misuse of his voice, image, and "jhakaas" phrase, separating parody from commercial exploitation.
- **Jackie Shroff & Arijit Singh (2024)**: Extended protection to AI voice cloning and impersonations.

Balancing Free Speech

- Courts balance personality rights with free speech (Article 19(1)(a)):

✓ **DM Entertainment Case (2010)**: Banned unauthorized "Daler Mehndi dolls" but allowed satire or parody.

✓ **Digital Collectibles Case (2023)**: Confirmed that art, news, or parody is fair use and doesn't violate rights.

Challenges and Reforms Needed

- Current court orders are inconsistent and case-by-case, lacking a unified law.
- Ordinary people, especially women, need protection from deepfakes and revenge porn, not just celebrities.
- Enforcing court orders (e.g., removing online content) is tough and resource-heavy.

- Experts call for a clear law to define personality rights and their limits.
- Conflict with freedom of speech and expression
- Not inheritable; In Germany rights are inheritable, heirs can control the commercial use of a deceased person's image for a limited time.

2019

Question:

1.In the context of polity, which one of the following would you accept as the most appropriate definition of liberty?

(a) Protection against tyranny
(b) Absence of restraints
(c) Opportunity to do whatever one likes
(d) Opportunity to develop oneself fully

2.Which one of the following reflects the most appropriate relationship between law and liberty?(2017)

(a) If there are more laws, there is less liberty
(b) If there are no laws, there is no liberty
(c) If there is liberty, laws have to be made by people
(d) If laws are changed too often, liberty is endangered

Answers: 1(d), 2 (b)

21. Electricity Act Amendments

India's Power Ministry proposes key amendments to the Electricity Act, 2003, to introduce competition and market discipline, aiming to resolve the crippling ~Rs 6.9 lakh crore (over $83 billion) accumulated losses of state-run distribution companies (discoms).

Electricity is in concurrent list

Proposed Amendments

- Allow private companies to distribute electricity in the same area, sharing the distribution network to increase competition and reduce infrastructure duplication.
- Permit industries consuming above 1 MW to directly buy power from private suppliers (open access), reducing dependence on state-run discoms.
- Remove universal service obligation (USO) on discoms to supply all consumers, allowing flexibility.
- State Electricity Regulatory Commissions (SERCs) to determine tariffs independently and implement them from April 1 annually, improving financial discipline and reducing delays.
- Designate a licensee to supply power at premium tariffs during shortages to open access consumers.

Why These Amendments?

- Discoms are incurring huge losses (₹6.9 lakh crore) due to inefficiencies, technical losses, poor billing, and cross-subsidies.
- Offering open access and competition can improve revenue flows by attracting industries that need affordable, uninterrupted power.
- Reducing tariff distortions will boost industrial competitiveness and MSME growth.
- Allowing tariff-setting by SERCs will bring more transparency, faster tariff revision, and accountability.
- The reforms align with India's goals to modernize and financially strengthen the power distribution sector.

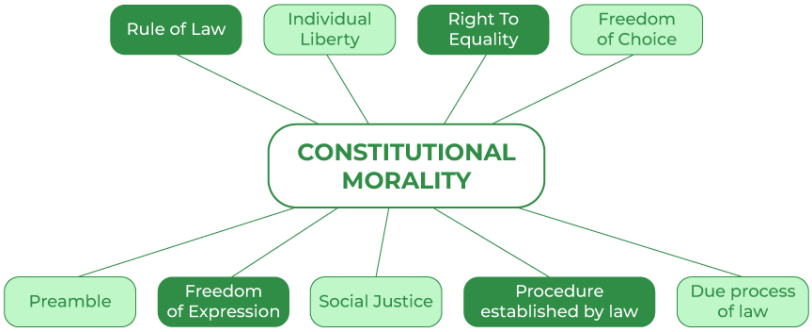
Challenges

- The amendments require state government and regulator concurrence.
- Political resistance from states and employees in state-run discoms is expected.
- Some states have resisted similar reforms in the past, delaying implementation.

22. Constitutional morality

Constitutional morality refers to the **ethical principles, values, and conventions** that guide the functioning of constitutional actors (government, judiciary, citizens) in **upholding the spirit of the Constitution**, not merely its legal text.

It demands adherence to **justice, liberty, equality, fraternity, and rule of law**, ensuring **inclusive and fair governance**.



A.V. Dicey's Two Aspects of Constitutional Law

Aspect	Nature	Enforcement	Example
Law of the Constitution	Written, enforceable provisions of the Constitution/statutes.	Enforced by courts.	Fundamental Rights, Separation of Powers.
Conventions of the Constitution *(Constitutional Morality)*	Unwritten practices guiding constitutional behavior.	Not legally enforceable; enforced politically or morally.	PM avoiding appointment of tainted ministers (Manoj Narula, 2014).

Scope of Constitutional Morality

- **Upholding Fundamental Rights:** Equality (Art.14), non-discrimination (Art.15), abolition of untouchability (Art.17).
- **Judicial Empathy:** Protects dignity and lived realities (e.g., *Navtej Singh Johar*, 2018).
- **Checking Majoritarianism:** Protects minorities and women (*Sabarimala*, 2018).
- **Non-retrogression of Rights:** Prevents rollback of social justice gains (*Puttaswamy*, 2017).
- **Fraternity & Dignity:** Counters caste and gender-based exclusion.

Judiciary as Guardian of Constitutional Morality

Case	Principle Upheld
***Kesavananda Bharati* (1973)**	Basic Structure doctrine rooted in constitutional morality.
***Puttaswamy* (2017)**	Right to privacy = individual autonomy and dignity.
***Navtej Singh Johar* (2018)**	Constitutional morality > societal morality; decriminalized homosexuality.
***Joseph Shine* (2018)**	Gender equality; struck down adultery law.
***Sabarimala* (2018)**	Equality and dignity for women over religious customs.
***Manoj Narula* (2014)**	Expected ethical conduct from PM/Ministers though not enforceable.

Challenges

- **Non-enforceable conventions:** Courts rely on political accountability.
- **Societal resistance:** Deep-rooted caste/majoritarian norms.
- **Implementation gaps:** Weak enforcement of welfare laws (e.g., manual scavenging).
- **Judicial overreach debates:** Balancing reform and tradition (*Sabarimala*).

- **Lack of civic culture:** Ambedkar's warning Constitutional morality must be *cultivated*, not assumed.

Key Case: *Manoj Narula v. Union of India* (2014)
- **Issue:** Appointment of ministers with criminal charges.
- **Judgment:** Court cannot disqualify; left to PM's "constitutional conscience."
- **Significance:** Reinforced that *constitutional morality is expected*, not judicially enforced.

"Constitutional morality is not a natural sentiment; it must be cultivated." — **B.R. Ambedkar**
It ensures that **democratic power operates within ethical bounds**, safeguarding the Constitution's spirit against populism, prejudice, and arbitrariness.

PYQ

Consider the following statements: (UPSC Prelims 2025)
With reference to the Constitution of India, if an area in a State is declared as Scheduled Area under the Fifth Schedule
1)the State Government loses its executive power in such areas and a local body assumes total administration
2) the Union Government can take over the total administration of such areas under certain circum-stances on the recommendations of the Governor

Which of the statements given above is/are correct?
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2
Answer: d (Neither 1 nor 2)

23. Greater Nagalim

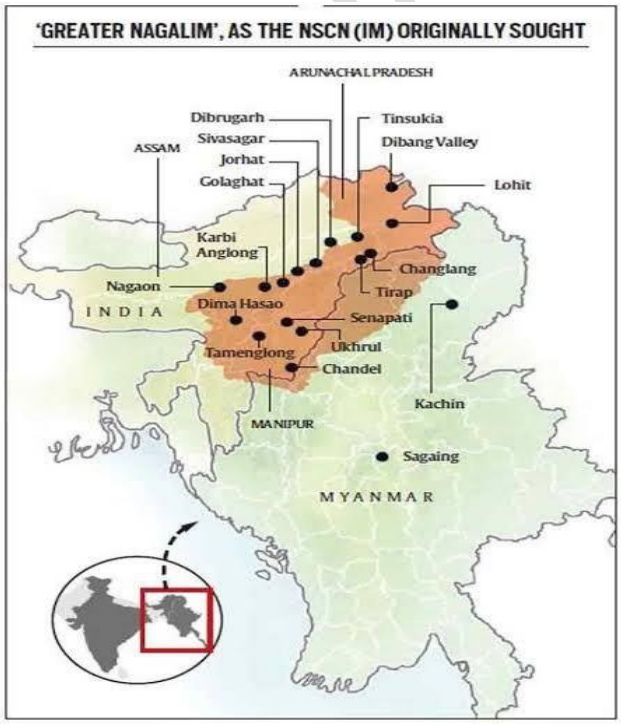
Background

- **Statehood:** Nagaland became the 16th state of India in 1963, after prolonged unrest led by the Naga National Council (NNC) under A.Z. Phizo, which first demanded independence (1947).
- **Ethnic Composition:** Home to 16+ Naga tribes (e.g., Angami, Ao, Sema, Lotha), sharing common ethnic identity but diverse dialects and traditions.
- **Core Issue:** Quest for self-determination and preservation of distinct Naga identity—political, cultural, and territorial.

The 2015 Framework Agreement (FA) between the Government of India and the National Socialist Council of Nagalim (Isak-Muivah faction) [NSCN-IM] aimed to set the foundation for resolving the long-standing Naga insurgency through peace.

Key Demands of NSCN-IM

- **Separate Constitution and Flag**: A Naga-specific governance framework and national symbols to affirm "shared sovereignty" with India, beyond Article 371A's special provisions for Nagaland (cultural/land rights).
- **Integration of Naga Areas**: Redraw boundaries to unite all Naga territories under one administrative unit, rejecting India's federal structure.



Key Points of the Framework Agreement:

- Signed in August 2015 after over 80 rounds of negotiations.
- Recognizes the unique history, culture, and political aspirations of the Nagas.
- Introduces the concept of "shared sovereignty", allowing Nagas special political and autonomous status within India.
- NSCN-IM agreed to remain part of the Indian federation, but with a special autonomous arrangement, including enhanced legislative, executive, and financial powers.
- The agreement does not promise immediate redrawing of state boundaries, addressing concerns of neighboring states.
- It marks a commitment to a final peaceful settlement through continued talks.

Contentious Issues and Challenges:

- The exact details of the FA have not been fully disclosed, leading to suspicions and discomfort among Nagaland factions and neighboring states.
- NSCN-IM claims the Indian government has not fully implemented the agreement and alleges divide and rule tactics by engaging other Naga groups.
- Differences persist over the interpretation of "shared sovereignty" and autonomy.
- Political challenges continue in harmonizing interests of various Naga groups, state governments, and the Centre.

Current Status:

- NSCN-IM urges the government to honor the FA.
- The peace process is ongoing but fragile due to differing expectations and incomplete implementation.
- Government insists on protecting territorial integrity and constitutional framework.

NSCN (National Socialist Council of Nagaland) once united these groups but later split into factions: NSCN-IM (Isak-Muivah faction) and NSCN-Khaplang (now deceased leader). These factions represent different political and insurgent interests within the Naga movement.

24. Dugong

- Dugong is a marine; herbivorous mammal often called the "sea cow"; it grazes on seagrass meadows in shallow coastal waters.
- Found in India near Andaman & Nicobar Islands, Gulf of Mannar, Palk Bay, and Gulf of Kutch.
- Population is declining due to habitat loss, fishing, coastal development, and slow reproductive rate.

IUCN Status

- Dugong is classified as "Vulnerable" on the IUCN Red List globally, and as "Regionally Endangered" in India due to drastic population decline.

Conservation Methods in India

- Legal protection under Wildlife (Protection) Act, 1972 (Schedule I).
- Project Dugong and its conservation plan under the Ministry of Environment, Forests and Climate Change.
- Creation of protected areas such as the Gulf of Mannar Biosphere Reserve and inclusion in policies like Coastal Regulation Zone.
- Conservation of seagrass meadows, community awareness programs, and involving local fishers in monitoring.
- Efforts towards research, population surveys, and rescue operations.

Importance

- Dugongs help maintain healthy seagrass habitats which support coastal biodiversity, fisheries, and carbon sequestration.
- Considered a keystone species for healthy marine ecosystems.

Manatee

- Manatees are close relatives and, along with dugongs, belong to Order Sirenia.
- Main difference: Dugongs are strictly marine, while manatees occupy both freshwater and marine environments.
- Manatees are found in West Africa, parts of the Americas, and the Amazon, not in Indian waters.
- Manatees have a rounded tail; dugongs have a fluke (whale-like) tail.

Dugong vs. Manatee: Comparison Table

Feature	Dugong	Manatee
Range	Indian & Indo-Pacific Oceans	Americas, West Africa
Habitat	Strictly marine (seagrass beds)	Marine, estuarine, freshwater
Tail Shape	Fluked (whale-like)	Rounded
Snout	Downturned for bottom-feeding	Shorter, faces forward
Presence in India	Yes	No

UPSC 2015 Prelims Question

With reference to 'dugong', a mammal found in India, which of the following statements is/are correct?

1. It is an herbivorous marine animal.
2. It is found along the entire coast of India.
3. It is given legal protection under Schedule I of the Wildlife (Protection) Act, 1972.

Select the correct answer using the code given below:

A. 1 and 2
B. 2 only
C. 1 and 3
D. 3 only

Answer: C

25. The SAIME model

Context: The SAIME model was awarded FAO's Global Technical Recognition during the organization's 80th Anniversary at the World Food Forum in Rome, Italy, on October 15, 2025.

- Developed by the Nature Environment and Wildlife Society (NEWS) in West Bengal's Sundarbans, it showcases a successful blend of environmental and livelihood goals.

What is the SAIME Model?

- SAIME is an ecosystem-based, climate-adaptive, and conservation-linked livelihood initiative integrating 5%–30% mangrove cover into aquaculture ponds, primarily shrimp farming.
- It is a multi-stakeholder partnership involving local communities, NGOs, and international partners to restore mangroves alongside productive, chemical-free shrimp aquaculture.

Concept: Integrating Mangrove with Aquaculture

1. Traditional Problems

- Conventional shrimp farming often involves clearing vast tracts of mangrove forests, leading to habitat loss, coastal erosion, reduced biodiversity, and increased vulnerability to storms.
- Dependency on commercial feed and chemicals raises production costs and creates pollution.

2. SAIME Innovation

- Mangrove seedlings are planted within aquaculture ponds and embankments, stabilizing soil, promoting biodiversity, and providing natural feed (leaf litter) for shrimp.
- Farmers use mangrove litter as fodder, minimizing input costs and avoiding chemical feed and antibiotics, thus enabling more resilient, cost-effective, and ecologically harmonious farming.

Environmental & Ecological Benefits

Benefit	Explanation
Coastal resilience	Mangroves buffer against cyclones, storm surges, and coastal erosion.
Carbon sequestration	Mangroves trap carbon, mitigating climate change.
Biodiversity conservation	Enhanced mangrove cover supports diverse fauna, birds, and aquatic species.
Habitat restoration	Restored mangrove ecosystems replenish degraded coasts and embankments.
Water quality improvement	Mangroves filter pollutants and stabilize soil, improving pond health.

26. India's open natural ecosystems are increasingly threatened, IUCN Redlist update shows

Context: The State of India's Birds (SoIB) 2025 report and IUCN Red List have uplisted four Indian bird species due to rapid habitat loss and declining populations.

- The update highlights the crisis facing India's grasslands and open ecosystems, vital for many endemic species.

Bird Species Uplisted by IUCN

- Indian Courser (Cursorius coromandelicus):
  Endemic to India; moved from *Least Concern → Near Threatened* due to loss of grasslands and fallow land.
- Indian Roller (Coracias benghalensis):
  Uplisted to *Near Threatened*; impacted by widespread habitat conversion and electrocution from power lines.
- Rufous-tailed Lark (Ammomanes phoenicura):
  Now *Near Threatened*; decline driven by intensive agriculture and land-use change.
- Long-billed Grasshopper-Warbler (Locustella major):
  Uplisted to *Endangered* due to reedbed and scrub habitat destruction.

About the State of India's Birds (SoIB) Report

- Conducted by the State of India's Birds Partnership, a collaboration of 13 organisations, including BNHS, WII, ZSI, SACON, WTI, WWF-India, ATREE, NCF, and Wetlands International – South Asia.
- Assessment used citizen-science data from eBird, analysing long-term population and habitat trends.
- Out of 1,360 global bird species assessed, 12 were from India — 8 downlisted and 4 uplisted.

Key Findings

- Decline is most severe in open-country birds like grassland and scrubland species.
- Habitat degradation from agriculture, infrastructure expansion, and afforestation of open lands are key threats.
- The report urges action beyond protected areas, emphasizing conservation of human-dominated landscapes.

Why It Matters

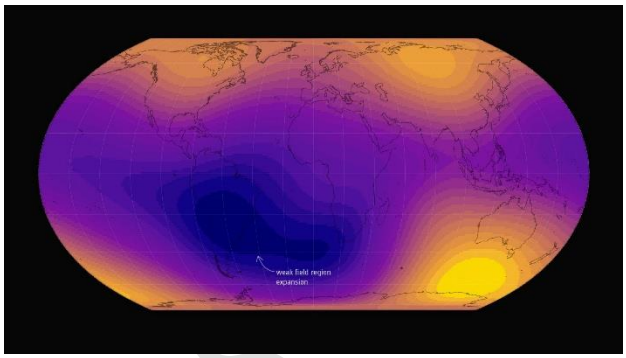
- The uplisting of these birds signals a broader ecological crisis for India's disappearing grasslands, often overlooked in conservation planning.
- It also underscores the power of citizen science in influencing IUCN assessments and guiding targeted policies for ecosystem conservation.

27. South Atlantic Anomaly Expansion

Overview

- Researchers using the European Space Agency's 'Swarm' mission data reported that the South Atlantic Anomaly (SAA), a weak spot in Earth's magnetic field, has grown by 0.9% in surface coverage since 2014.
- The SAA is the region where the Earth's magnetic field is least intense, located over the South Atlantic Ocean.

Cause of the Anomaly



- The Earth's magnetic field is generated by the movement of molten iron and nickel in the outer core, a process called the geodynamo.
- Uneven flow in the core creates areas of varying magnetic strength, with weak spots like the SAA where the field spreads out.

Key Findings

- The SAA's expansion is a natural variation in the geomagnetic field, which constantly shifts as the fluid core moves.
- Weak regions can grow, shrink, or move over decades without affecting the planet's overall magnetic shield.

No Cause for Concern

- Scientists confirm the expansion is within expected limits and does not indicate a magnetic field reversal or collapse.
- The changes pose no immediate threat to Earth's protective magnetic shield or life on the planet.

What is the Geodynamo?

- The geodynamo is the process by which Earth's magnetic field is generated and sustained.
- It occurs due to the movement of molten iron and nickel in Earth's outer core about 3,000 km beneath the surface.
- These convection currents, influenced by Earth's rotation (Coriolis effect), create electric currents, which in turn produce the planet's magnetic field. This is a self-sustaining loop.

Importance of Earth's Magnetic Field

- Acts as a protective shield by deflecting harmful solar wind and cosmic radiation, making life possible.
- Shields satellites, power grids, and other technology from space weather.
- Essential for navigation in animals and humans (compasses).

How Often Does the Magnetic Field Shift?

- Earth's magnetic field is dynamic and shifts constantly because of changes in the outer core.
- Geomagnetic reversal: The poles flip every 200,000–300,000 years on average, but the interval can be as short as 10,000 years or as long as 25 million years. The last reversal occurred ~780,000 years ago.
- Smaller, temporary flips (geomagnetic excursions) and pole drifts also occur; the North Magnetic Pole currently moves ~35 km/year toward Siberia.

Q. **Consider the following statements**:

1. The Earth's magnetic field has reversed every few hundred thousand years.
2. When the Earth was created more than 4000 million years ago, there was 54% oxygen and no carbon dioxide.

Which of the statements given above is/are correct?

(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Answer A

28. Water Hyacinth (Eichhornia crassipes)

1. Introduction

- **Scientific Name**: *Eichhornia crassipes*
- **Origin**: Native to **Amazon Basin (South America)**.
- **Nature**: **Free-floating aquatic weed**, considered one of the **world's most invasive plants**.

Introduction in India

- **Introduced by the British** in the **late 19th century (around 1890s)** as an **ornamental plant** in **Bengal**.
- Reason: Its **beautiful violet flowers** made it popular for **decorative ponds and botanical gardens**.
- However, due to its **rapid vegetative reproduction**, it spread uncontrollably to rivers, tanks, and wetlands.

2. Characteristics and Growth Pattern

- Grows **exponentially** doubles its biomass in **10–15 days**.
- Reproduces both **vegetatively** (through runners) and by **seeds** (can survive up to 20 years).
- Forms **thick mats** on water surfaces blocking sunlight, oxygen, and navigation.

3. Threats and Impacts

Dimension	Impact
Ecological	- Depletes dissolved oxygen → causes **fish kills**. - Blocks sunlight → hampers photosynthesis of submerged flora. - Reduces biodiversity in aquatic ecosystems. - Alters nutrient cycles and pH of water bodies.
Economic	- Obstructs **fishing, irrigation, and navigation**. - Increases **maintenance cost** of canals and reservoirs. - Reduces hydropower efficiency by clogging turbines.
Health	- Breeding ground for **mosquitoes** (malaria, dengue) and **snails** (schistosomiasis).
Social	- Affects **livelihoods** of fisherfolk and farmers dependent on inland waters. - Impacts **drinking water sources**.
Hydrological	- Promotes **siltation**, decreases water storage capacity of tanks/reservoirs.

Status in India

- Present in almost all states particularly in eutrophic (nutrient-rich) water bodies of:
  - ✓ West Bengal, Assam, Kerala, Andhra Pradesh, Odisha, and Tamil Nadu.
- Loktak Lake (Manipur), Vembanad Lake (Kerala), and Chilika Lake (Odisha) have faced major infestations.

Government and Scientific Control Mechanisms

A. Mechanical Control

- **Manual removal / harvesting** using nets and mechanical harvesters.
- Effective for **small-scale infestations**, but **labour-intensive and costly**.
- Example: **Loktak Lake Restoration Project (Manipur)** used mechanical weed harvesters.

B. Biological Control

- **Insects introduced** by the Indian Council of Agricultural Research (ICAR):

✓ *Neochetina eichhorniae* and *Neochetina bruchi* (Weevils) feed on water hyacinth leaves and petioles.

- Biological control is **eco-friendly**, though **slow-acting**.
- Some success observed in **Kuttanad region of Kerala** and **Kolkata wetlands**.

C. Chemical Control

- Herbicides such as **2,4-D**, **glyphosate**, and **diquat** used.
- However, chemical control is discouraged due to **toxicity to aquatic life** and **bioaccumulation**.

D. Ecological/Environmental Control

- Reduce **nutrient loading** (nitrates & phosphates) from agricultural runoff and sewage since eutrophication accelerates weed growth.
- Promote **constructed wetlands** for wastewater treatment.

E. Utilization-based Management

- Water hyacinth can be **used productively**:

✓ **Bio-composting** and **biogas production**.

✓ **Handicrafts and paper** manufacturing.

✓ **Phytoremediation**, absorbs heavy metals from polluted water.

F. Integrated Weed Management (IWM)

- Combines **biological + mechanical + ecological** methods.
- Long-term strategy emphasizing **catchment treatment**, **nutrient control**, and **sustained monitoring**.

Government Initiatives

- **National Wetland Conservation Programme (NWCP)** – focuses on removal of invasive weeds from major wetlands.
- **National Plan for Conservation of Aquatic Ecosystems (NPCA)** – integrates wetland and lake management (MoEFCC).
- **Namami Gange Mission** – includes biological control and community participation in weed removal.
- **State-level projects** – e.g., Kerala's "Mission Vembanad" and Assam's "Clean Deepar Beel" initiative.

Other Major Invasive Alien Plants in India

Species	Origin	Impact
Lantana camara	Tropical America	Invades forests and pastures, reduces native biodiversity, toxic to livestock.
Parthenium hysterophorus (*Congress grass*)	Tropical America	Causes allergies, dermatitis, reduces crop yield.
Prosopis juliflora (*Vilayati babool*)	Central/South America	Outcompetes native flora, affects grazing lands.
Mikania micrantha	Central & South America	"Mile-a-minute weed" — smothers forest canopies, affects plantations (esp. Northeast India).
Chromolaena odorata	America	Invasive in NE India, affects plantations and forest regeneration.

Control of Invasive Alien Species — Policy and Institutional Framework

- **Biological Diversity Act, 2002** – empowers control of invasive alien species.
- **National Biodiversity Authority (NBA)** – coordinates monitoring and research.
- **National Invasive Species Management Programme (Proposed)** – recommended by MoEFCC.
- **Indian Council of Agricultural Research (ICAR)** – conducts biocontrol research.
- **Forest Survey of India (FSI)** and **Botanical Survey of India (BSI)** – monitoring and mapping.

Scientific and Community-Based Strategies (Way Forward)

1. **Integrated Control** – use of biocontrol (weevils) with nutrient management.
2. **Community Participation** – local cooperatives for harvesting and composting.
3. **Public–Private Partnerships** – for utilization (biogas, compost, handicrafts).
4. **Research & Innovation** – development of **bioplastic** or **biofuel** from water hyacinth biomass.
5. **Awareness and Regulation** – restrict trade and ornamental use of invasive species.
6. **GIS Mapping and Early Warning Systems** – for timely detection and management.
7. **Catchment Area Treatment** – control nutrient inflow from agriculture and urban sources.

UPSC Prelims Questions

1. Which one of the following plants is effective in reducing water pollution and is also useful for producing biogas? *(1987)*

(a) Eucalyptus
(b) Water hyacinth
(c) Salvinia
(d) Lotus

Answer: (b) Water hyacinth

Explanation:

- Water Hyacinth (*Eichhornia crassipes*) absorbs heavy metals and organic pollutants, thus helping in phytoremediation (natural water purification).
- It is also used in biogas production due to its high biomass content, though its excessive growth causes ecological harm.

29. Great Nicobar Project

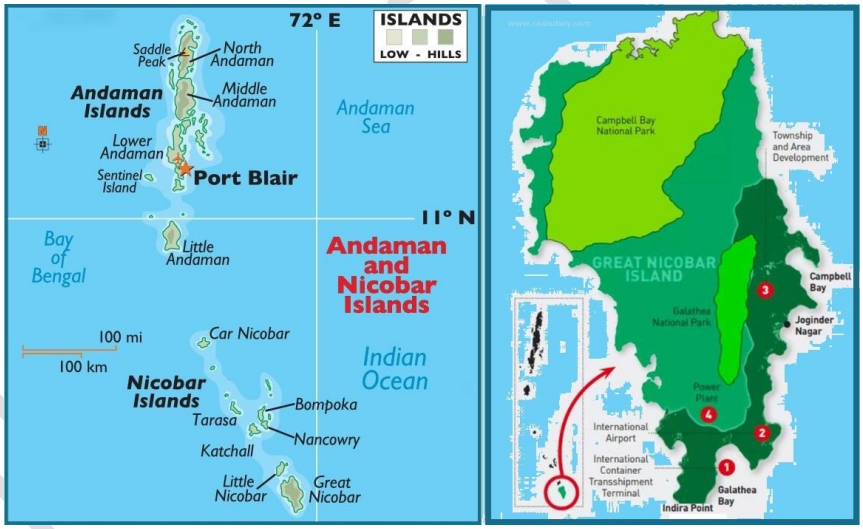
Great Nicobar Island Development Project

Basic Details

Parameter	Information
Project Name	Great Nicobar Island Development Project *(Galathea Bay Port Project)*
Location	Galathea Bay, Great Nicobar Island, Andaman & Nicobar Islands
Nodal Agency	NITI Aayog (Vision 2036 Plan)
Implementing Agency	Andaman & Nicobar Islands Integrated Development Corporation (ANI-IDCO)
Estimated Cost	₹72,000 + crore
Major Components	Deep-sea transshipment port (20 M TEU), international airport, greenfield township, power plant, trunk road, and support infrastructure

Objectives and Rationale

- **Strategic:** Enhance India's maritime foot-print near the **Strait of Malacca**, a key global chokepoint.
- **Economic:** Reduce dependence on foreign transshipment hubs (Colombo, Singa-pore).
- **Developmental:** Generate employment, boost local economy, and integrate island logistics into India's maritime network.
- **Complementarity:** Part of a *tri-port mari-time arc* with **Vizhinjam** (Kerala) and **Va-dhavan** (Maharashtra).



Trunk Infrastructure Road

- Connects all Great Nicobar villages to the new township, airport, and port.
- **Total Land:** 666 ha (including 80 ha private).
- **Villages Affected:** Campbell Bay, Govind Nagar, Joginder Nagar, Vijay Nagar, Laxmi Nagar, Gandhi Na-gar.
- **Goal:** Enable connectivity, movement of goods and people, and regional integration.

Concerns and Criticisms

1. Tribal & Social Impact

- **Communities affected:** *Shompen* and *Nicobarese* (PVTGs).
- **Issues:**

✓ Lack of **free, prior, informed consent** (violates FRA 2006, Andaman & Nicobar Aboriginal Tribes Regulation 1956).

✓ Threat to **culture, isolation, and health** (similar to Jarawa route impacts).

✓ Risk of displacement and exploitation through tourism and infrastructure encroachment.

2. Ecological & Environmental Risks

- Located in **Sundaland Biodiversity Hotspot**.
- Threatens **tropical rainforests, coral reefs, mangroves**, and endemic species (Nicobar megapode, saltwater crocodile).
- Lies in a **seismic and tsunami-prone zone** (2004 tsunami devastated area).
- **EIA flaws:** Downplays risks; lacks transparency; public consultation limited to 21 days.

3. Economic & Logistical Limitations

- No industrial hinterland or urban ecosystem to sustain a port.
- High operational costs due to distance from mainland (~1,200 km).
- Absence of feeder routes and cargo networks → likely **low utilization**, as seen in Vallarpadam Port.
- Risk of *"build-it-and-they-will-come"* fallacy in traffic projections.

4. Strategic & Planning Issues

- Military presence already ensured via **INS Baaz** (Campbell Bay).
- Cloaking defense motives under a commercial project could distort civilian priorities.
- Comparisons with Vizhinjam/Vadhavan unrealistic — they have mainland industrial bases; Great Nicobar does not.

Environmental & Legal Safeguards Demanded

- Transparent **Social Impact Assessment (SIA)** and **biodiversity audit**.
- **FPIC (Free, Prior, Informed Consent)** of tribal councils.
- Strict adherence to **Coastal Regulation Zone (CRZ)** and **EIA Notification 2006**.
- Disaster-resilient design and green certification.

Geographical Context: Andaman & Nicobar Islands

- **Location:** Bay of Bengal, between **6° N – 14° N** and **92° E – 94° E**.
- **Composition:** ~572 islands; divided by the **Ten Degree Channel** — *Andaman (North) | Nicobar (South).*
- **Origin:** Uplifted portion of the **Arakan Yoma** fold mountains; volcanic in parts (Barren Island = India's only active volcano).
- **Vegetation:** Equatorial rainforest; coral-rich coastlines.

30. Green Crackers

What are Traditional Firecrackers?

- Conventional fireworks banned by SC (Arjun Gopal vs Union of India, 2018).
- **Composition:** Barium, sulphur, potassium nitrate, aluminium.
- **Impact:**
  - ✓ Produce **bright colors and loud noises**
  - ✓ Release **heavy metals, toxic gases, and particulate matter**, causing air pollution

What are Green Crackers

- **Developed By**: CSIR-NEERI (2018) under Supreme Court order to reduce Diwali pollution.
- **Types**: SWAS (Safe Water Releaser), STAR (Safe Thermite), SAFAL (Safe Minimal Aluminium).
- **Chemistry**: Replace barium nitrate (toxic) with potassium nitrate/strontium; limit aluminium; add zeolite/iron oxide to trap dust.

Types of Green Crackers (CSIR–NEERI Certified)

Type	Full Form	Key Features
SWAS	Safe WaterReleaser	Releases water vapour and dust suppressants to reduce particulate matter
STAR	Safe Thermite Cracker	Reduces emission of SO_2 and NO_x
SAFAL	Safe Minimal Aluminium	Minimises usage of aluminium, reducing metallic oxides in emissions

- Each cracker carries a **QR code** (for authenticity) issued under the **CSIR–NEERI certification system**.
- Thermite is a mixture of finely powdered aluminium and iron oxide that produces a very high temperature on combustion

Who Manufactures and Approves Them

- **Developed by:** CSIR–NEERI, Nagpur (2018 onwards).
- **Manufactured by:** Registered fireworks units in India, primarily **Sivakasi (Tamil Nadu)** and **West Bengal**.
- **Approval and Registration:**
  - ✓ Manufacturers must have an **explosive licence** from the **Petroleum and Explosives Safety Organisation (PESO)**.
  - ✓ They must obtain **registration and technology transfer approval** from CSIR–NEERI.
  - ✓ Around **1,500 manufacturers** (as of 2024) hold licences to produce green crackers.

Efficacy

- **Emission Reduction**: 30–40% less $PM_{2.5}/PM_{10}$, SO_2, NO_x vs. traditional crackers (NEERI tests).
- **Barium Cut**: 30–60% less toxic barium in air/soil.
- **Noise**: Reduced by 30% (below 125 dB).

- **Verification**: QR code + CSIR-NEERI logo for authenticity.

Issues & Limitations

- **Not Pollution-Free**: Still emit ultrafine particles (UFPs <100 nm) 138% rise in Delhi 2019 study; penetrate lungs/blood.
- Ultrafine particles: Increases in ultrafine particles, even with lower mass emissions, raise concerns about deep lung penetration and systemic exposure.
- **Soil Contamination**: Residual Al, Sr, Mg in ash/soil (laser spectroscopy 2024).
- **Health Risks**: Trigger asthma, heart issues; unsafe for kids/elderly.
- **Counterfeits**: Fake "green" crackers flood market; QR system ineffective.
- **Short-Term Spike**: Diwali PM levels still dangerous despite 30% cut.
- **No Global Standard**: India only has formal program; China/US have low-smoke but no certification.

31. Tropical Cyclone Management

1. Nature and Classification

- **Definition:** Atmospheric disturbance around a low-pressure center with violent winds and heavy rain.
- **Rotation:**
  - ✓ **Anticlockwise** – Northern Hemisphere
  - ✓ **Clockwise** – Southern Hemisphere
- **Types:**
  - ✓ **Tropical Cyclones** – between Tropics of Cancer & Capricorn
  - ✓ **Extra-Tropical Cyclones** – mid-latitudes
- **Global Names:**
  - ✓ *Hurricanes* (Atlantic/Caribbean)
  - ✓ *Typhoons* (Pacific)
  - ✓ *Cyclones* (Indian Ocean)
  - ✓ *Willy-Willies* (NW Australia)

2. IMD Classification (Wind Speed)

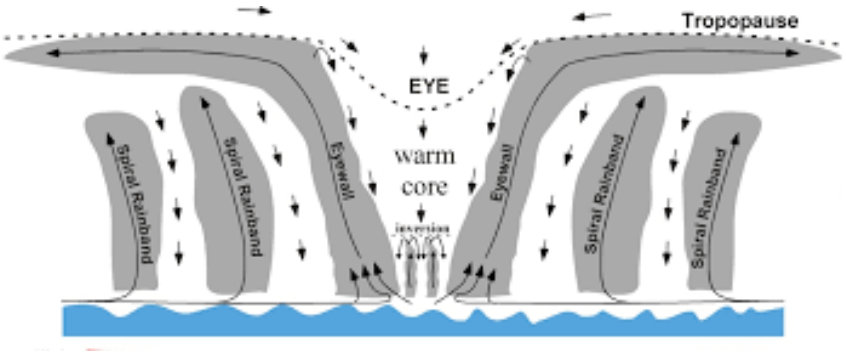
Category	Speed (km/h)	Remarks
Low Pressure	<31	Weak system
Depression	31–49	Organized wind circulation
Deep Depression	49–61	Moderate system
Cyclonic Storm	61–88	Naming starts
Severe Cyclonic Storm	89–117	Major rainfall, storm surge
Super Cyclone	>221	Catastrophic

3. Formation Stages

1. **Initial Development:**
   - ✓ Sea surface temp >26°C (to 60 m depth).
   - ✓ Strong evaporation + vertical convection.
2. **Mature Stage:**
   - ✓ Vigorous thunderstorms, concentric cloud bands.
   - ✓ Eye forms (warm center).
3. **Decay Stage:**
   - ✓ Weakens after landfall or moving over cold waters.

4. Indian Context

- **Exposure:** 10 % of world's tropical cyclones; **long coastline – 11,000 km.**
- **Season:** *Bimodal* – May–June & Oct–Nov.
- **Ratio:** Bay of Bengal : Arabian Sea ≈ 4 : 1.
- **Peak Risk:** East coast (Odisha, Andhra Pradesh, West Bengal, Tamil Nadu).
- **Impacts:** Wind damage, storm surge flooding, torrential rainfall, crop & infra-structure loss.



5. Management Strategies

A. Structural Measures

- Cyclone-resistant buildings, embank-ments, drainage systems.

- Strengthened roads, bridges, power, and telecom lines.
- Coastal afforestation (mangroves as bio-shields).

B. Non-Structural Measures
- Early warning & evacuation systems.
- Public awareness and community preparedness.
- Coastal zone management & land-use regulation.

6. National Cyclone Risk Mitigation Project (NCRMP)

Component	Focus Area
A	Early-warning dissemination and last-mile connectivity
B	Construction of cyclone shelters, embankments, plantations
C	Technical assistance & capacity building
D	Project management & institutional support

7. Other Key Initiatives
- **RIMES:** Regional early-warning network for Asia & Africa.
- **IMD & INCOIS:** Satellite, radar, and ocean-state forecasting.
- **NDRF & SDRF:** Rapid rescue and relief operations.
- **Best Practice – Odisha (Phailin 2013):** Near-zero casualties through advance evacuation and community drills.

8. Cyclone Naming
- Started 2004 under **WMO–ESCAP Panel.**
- 13 member countries (India, Bangladesh, Sri Lanka etc.) contribute 13 names each (total 169).
- **IMD (RSMC-New Delhi)** assigns names once sustained winds ≥ 62 km/h.
- Names are **short, neutral, non-repetitive.**

9. Key MCQ Recall

Only **some cyclones develop an eye** → (Correct Answer: **C – 2 only**)

India's cyclone management has evolved from *response-centric* to *resilience-centric*: blending **science-based early warnings, resilient infrastructure, community participation, and regional cooperation** to minimize human and economic losses.

Naming of cyclones

Cyclones in the North Indian Ocean are named sequentially from a list of 169 names provided by 13 member countries, including India, Bangladesh, Sri Lanka, and Thailand. The India Meteorological Department (IMD) assigns names when a cyclone forms and has a sustained wind speed of at least 62 km/h. Names are chosen to be short, easy to pronounce, and culturally neutral, and are used only once.

The naming processes
- **Regional agreement:** The World Meteorological Organization (WMO) and the ESCAP Panel on Tropical Cyclones (PTC) agreed to start naming cyclones in the region in 2004.

- **Member country contributions:** Each of the 13 member countries submits 13 names to create a list of 169 names.
- **Sequential assignment:** Names are used in alphabetical order. For example, after "Montha," the next cyclone will be named "Senyar" (UAE), followed by "Ditwah" (Yemen), "Arnab" (Bangladesh), and "Murasu" (India).
- **Criteria for names:** Names must be neutral to politics, religion, and gender; they should not be rude or cruel; and they must be short, easy to pronounce, and not offensive.
- **No repetition:** A name that has been used is retired and is not repeated.
- **IMD responsibility:** The IMD is the Regional Specialized Meteorological Centre (RSMC) for this region and is responsible for assigning the names when a cyclone reaches the required intensity

32. The Remission of Duties and Taxes on Exported Products (RoDTEP) scheme

The Remission of Duties and Taxes on Exported Products (RoDTEP) scheme, launched on January 1, 2021, by the Government of India, is a WTO-compliant initiative to support exporters by refunding taxes and duties not covered by other schemes. It replaced the Merchandise Exports from India Scheme (MEIS) after a WTO ruling against MEIS for violating trade rules.

What is RoDTEP?

- RoDTEP refunds taxes and duties on exported goods not covered by other schemes. It helps exporters stay competitive by lowering costs (e.g., ₹15,070 crore budget in 2023–24).
- Unlike MEIS, it's not an export subsidy but a tax remission, aligning with WTO rules. Rebates are given as transferable e-scrips based on export value.

Scenario Before RoDTEP

- **MEIS (2015–2020)**: Gave exporters duty credit scrips (2–7% of export value) to offset import duties. Supported 8,000+ products but ruled non-compliant by WTO in 2019.
- **WTO Dispute**: USA challenged MEIS as an illegal export subsidy causing trade distortions. India phased it out by December 2020 to avoid penalties.
- **Need for Replacement**: Exporters faced high input costs (e.g., electricity duty, VAT). RoDTEP was launched to refund these while meeting WTO norms.
- **Transition Impact**: Covered 8,555 tariff lines from January 2021; expanded to all sectors by August 2023. Replaced MEIS's ₹39,000 crore outlay with sustainable rebates.

Features of RoDTEP

- **Tax Refunds**: Reimburses central, state, and local taxes/duties (e.g., VAT on fuel, stamp duty). Rates range from 0.5–4.3% of FOB (Freight on Board) value.
- **Transferable E-Scrips**: Rebates issued as digital credits via CBIC's ledger; usable for customs duties or sold. Over 1 million e-scrips issued in 2023–24.
- **Wide Coverage**: Applies to all export sectors, including textiles, chemicals, and steel. Excludes re-exported and SEZ/EOU goods; covers 8,555+ products.
- **WTO Compliance**: Refunds only non-rebated taxes, not incentives, avoiding trade disputes. Aligned with Make in India for competitive exports.

Administered By

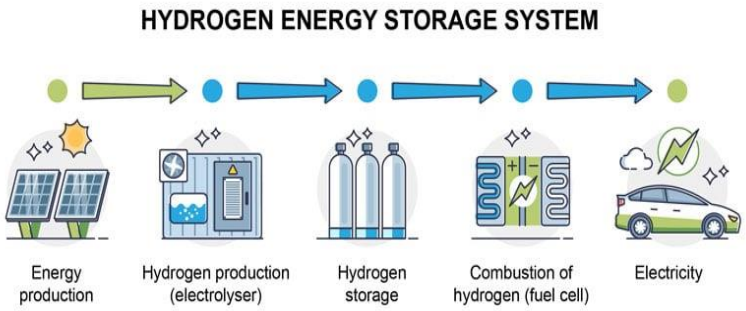
- **Department of Revenue**: Ministry of Finance oversees implementation; CBIC manages digital ledger for e-scrips. Disbursed ₹10,500 crore in 2023–24.
- **RoDTEP Committee**: Sets sector-wise rebate rates; reviews annually with Export Promotion Councils. Rates capped at ₹100/quintal for agriculture, 2–4% for others.
- **Coordination**: Works with Chambers of Commerce and EPCs (e.g., FIEO) for feedback. Ensures transparency via ICEGATE portal for e-scrips.

33. Hydrogen as fuel

Hydrogen is a clean energy source used for fuel, power, and industry, but production methods vary by color based on environmental impact. Green hydrogen is the cleanest (zero emissions), while grey and blue are dirtier or transitional. China dominates grey/blue production (36.5 million tonnes in 2024, half the world's total) but lags in green due to tech gaps. India's National Green Hydrogen Mission (2023, ₹19,744 crore) aims for 5 million tonnes by 2030, positioning India as a leader.

Types of Hydrogen

- **Grey Hydrogen**: Made from natural gas (steam methane reforming), emitting 9–12 kg CO2 per kg hydrogen. Cheapest (₹150–200/kg) but polluting; 95% of global production (120 million tonnes, 2024).
- **Blue Hydrogen**: Like grey, but CO2 captured and stored (CCS). Reduces emissions by 90%; costlier (₹200–250/kg); transitional tech, with China leading CCS pilots.
- **Green Hydrogen**: Produced via electrolysis (electricity splits water into hydrogen/oxygen), using renewables (solar/wind). Zero emissions; expensive (₹300–400/kg, dropping to ₹150/kg by 2030); only 1% of global output (120,000 tonnes, 2024).



Electrolysis Process: Electricity passes through water with an electrolyte, splitting H2O into H2 and O2. Requires 50–55 kWh per kg hydrogen; green version uses renewable energy.

Electrolysers in Green Hydrogen Production

- Alkaline Electrolysers (ALK): Mature technology, use alkaline solutions as electrolyte; cost-effective but less efficient and slower.
- Proton Exchange Membrane (PEM) Electrolysers: Newer technology, uses polymer membranes; more efficient, flexible, and produces higher purity hydrogen but demand rare materials like platinum, making costlier.

Why China is Lagging in Electrolyser Market

- China dominates the solar PV module market due to cheaper production but has not replicated this success in electrolysers.
- PEM electrolysers face supply chain constraints due to dependence on rare metals such as iridium and platinum, heavily imported.
- Despite manufacturing scale, China struggles with long-term raw material supply and complexity of PEM technology.
- ALK electrolysers have low cost advantages but are less efficient and smaller scale compared to global competitors.
- Chinese firms are entering green hydrogen, signing deals for overseas facilities, but face challenges in scaling advanced electrolyser tech domestically.

India's Role in Green Hydrogen Mission

- India is aggressively promoting green hydrogen production under its National Hydrogen Mission.

- Developing renewable energy capacity, supporting electrolyser manufacturing, and implementing pilot projects for large-scale green hydrogen use.
- Focus on cost-effective and scalable electrolyser technology to reduce reliance on imports.
- Collaborating internationally to share technology and best practices.
- Promoting green hydrogen for industrial decarbonisation, transport, and clean energy storage, advancing energy transition goals.

34. Wheat

Wheat in India

- **Crop Season**: Rabi crop (winter-sown).
  - ✓ Sowing: October–December.
  - ✓ Harvesting: April–June.
- **Importance**: India's 2nd most important cereal (after rice); staple in northern/northwestern states (e.g., chapati belt).
- **Nutritional Value**: Rich in calcium, thiamine (B1), riboflavin (B2), and iron.

Agro Climatic conditions

- Wheat is a major rabi crop in India, sown in winter (November–December) and harvested in spring (March–April).
- Optimal temperature: 10°C to 15°C during sowing and 21°C to 26°C at ripening.
- Rainfall: 50–75 cm annually, well-distributed across the season; waterlogging or untimely rainfall is harmful.
- Soil: Best suited to well-drained loamy or clay loam soils with moderate fertility.
- Topography: Thrives on flat or gently undulating land, common in the Indo-Gangetic plains and black soil zones.

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Cultivation in India

- **Area Coverage (2023–24)**: 318.33 lakh hectares (~32 million ha).
- **Rank in India**: 2nd after paddy (rice) in area.
- **Major Wheat Belts**: Indo-Gangetic plains (Punjab, Haryana, UP, Bihar) + MP & Rajasthan.

Top Wheat-Producing States in India

1. Uttar Pradesh – largest producer (~35 million tonnes).
2. Madhya Pradesh – rapidly growing share ("wheat bowl of India").
3. Punjab & Haryana – high productivity due to irrigation (Green Revolution).
4. Others: Rajasthan, Bihar, Gujarat, Maharashtra.

Export Status

- **Major Destinations (2023–24)**: Nepal, Iraq, South Korea, UAE, Mongolia.
- **Share in World Trade**: <1% (India self-sufficient; exports fluctuate with policies like bans during inflation).

Global Wheat Scenario

- **Top 3 Producers (2023–24)**: China (136 million tonnes), India (110 million tonnes), Russia (92 million tonnes).
- **Global Share**: China, India, Russia account for ~41% of world production (~780 million tonnes).
- **Major Exporters Globally**: Russia, USA, Canada, Australia, Ukraine (India not major).

35. MSP

Minimum Support Price (MSP)

In **October 2025**, the Government of India raised the **wheat MSP to ₹2,585 per quintal**, aiming to strengthen farm incomes in major producing states such as **Uttar Pradesh and Madhya Pradesh**. MSP remains a cornerstone of India's agricultural price policy, balancing **farmer welfare**, **food security**, and **fiscal sustainability**.

What is MSP?

MSP is a **guaranteed floor price** that the government offers to farmers for select crops to **prevent distress sales** when market prices fall.

For example, the **₹2,585/quintal wheat MSP (2025)** ensures that farmers earn at least a **50% profit margin** over their production costs.

Who Announces MSP?

The **Commission for Agricultural Costs and Prices (CACP)** recommends MSPs after studying input costs, productivity, and market trends.

The **Union Cabinet**, chaired by the **Prime Minister**, finalizes and announces MSPs annually usually before the sowing season. The 2025 wheat MSP saw a **₹160 hike**.

How Many Crops Are Covered?

MSP applies to **23 crops**, including:

- **7 cereals:** e.g., wheat, paddy, maize
- **5 pulses:** e.g., gram, arhar
- **7 oilseeds:** e.g., mustard, groundnut
- **3 commercial crops:** cotton, jute, sugarcane (FRP instead of MSP)
- **Copra**

Procedure for Setting MSP

- CACP calculates **cost of production (A2+FL+50%)**, ensuring **1.5× return** to farmers.
- Inputs include **seeds, labour, fertilizers, irrigation, and land rent**.
- After consultations with **states and farmer bodies**, the **Cabinet** approves MSP.
- **FCI and state agencies** procure crops at MSP for schemes like **PDS and NFSA**.

Importance of MSP

- **Income Stability:** Protects farmers from price crashes; benefits ~15 million farmers annually.
- **Food Security:** Ensures buffer stocks **30 million tonnes of wheat (2024–25)** for PDS.
- **Economic Stimulus:** Boosts rural demand in key producing regions like UP and MP.
- **Policy Alignment:** Supports **PM-AASHA**, aiming for balanced price support and welfare.
- **Prevents Distress Sales:** Encourages assured income during bumper harvests.

Challenges with MSP

- **Limited Reach:** Only **~10% of farmers** benefit directly; smallholders in Bihar and eastern states often sell below MSP.

- **Fiscal Strain: ₹1.2 lakh crore** spent on procurement (2024–25); FCI faces storage and subsidy burdens.
- **Monocropping:** Encourages **rice-wheat dominance**, reducing crop diversity and harming soil health.
- **Price Distortions:** MSP often exceeds open-market rates; leads to unsold surpluses and black marketing.
- **Procurement Gaps:** Only **~40% of wheat** gets procured; storage losses reach **5%**.
- **Climate Risks:** Heatwaves reduced wheat output by **10–15% (2023–24)**; MSP hikes (6.6% in 2025) lag behind rising costs.

Pradhan Mantri Anna data Aay Sanrakshan Abhiyan (PM-AASHA) Scheme

Launched on **September 20, 2018**, under the **Ministry of Agriculture & Farmers Welfare**, **PM-AASHA** is an **umbrella scheme** designed to **ensure MSP realization**, particularly for **pulses, oilseeds, and copra**.
It seeks to stabilize prices, reduce import dependence, and enhance **farmer income security**.
Budget outlay: ₹15,053 crore (2020–21), **extended till 2025–26**.

Objectives

- Guarantee MSP realization to shield farmers from market volatility.
- Reduce reliance on **imports** of pulses and edible oils (India imports ~60% of edible oils).
- Promote **price stabilization** and **domestic production** for food security.

Components of PM-AASHA

1. **Price Support Scheme (PSS)**

- Agencies like **NAFED** and **FCI** procure pulses, oilseeds, and copra at MSP when market prices drop.
- Coverage: 25% of production (40% for oilseeds), 100% for copra.
- **State share:** 25% of procurement cost.
- *Example:* In 2023–24, 1.5 million tonnes of pulses procured, benefiting **5 lakh farmers**.

2. **Price Deficiency Payment Scheme (PDPS)**

- Farmers sell in the open market; government pays the **difference between MSP and market price**.
- Applicable to 25% of production; implemented in **Madhya Pradesh and Rajasthan**.
- Covers **7 pulses and 4 oilseeds**.

3. **Private Procurement & Stockist Scheme (PPSS)**

- Enables private players to procure at MSP, reducing government burden.
- Piloted in **Madhya Pradesh (gram/chana)**; stockists resell when prices recover.

Implementation and Coverage

- **Crops Covered:** 25 (7 pulses, 7 oilseeds, copra).
- **Agencies:** NAFED (pulses/oilseeds), FCI (procurement), NCCF (consumer cooperatives).
- **Funding Pattern:** 75% Centre, 25% States.
- **Technology Interface:** Farmers register via **eSamridhi / eSamyukti portals** for MSP-based procurement.
- **Linkages:** Tied to broader **PM-AASHA and Atmanirbhar Bharat** goals of self-reliant agriculture

36. Natural Farming in Himachal Pradesh

Himachal Pradesh is encouraging farmers to adopt chemical-free natural farming through supportive state policies, aiming to improve farmer incomes while protecting the environment, as part of India's broader push for sustainable agriculture.

Prakritik Kheti Khushhal Kisan Yojana (PK3Y)

Launch & Objective

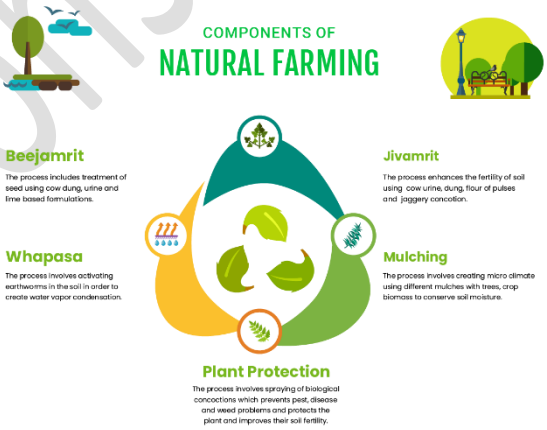
- **Launched:** 2018 (seven years ago) by the Government of Himachal Pradesh.
- **Aim:** Promote **chemical-free, low-cost, climate-resilient agriculture** using natural inputs like cow dung, cow urine, mulching, and biomass-based fertilisers.
- **Goal:** Double farmers' income and reduce ecological degradation.

What is Natural Farming

Natural Farming (NF) is a **chemical-free, eco-integrated** system where soil, water, plants, animals, and microbes function as a balanced ecosystem.

Core Principles

1. **No-Till Cultivation:** Retains soil structure and prevents erosion.
2. **On-Farm Inputs:** Uses local, organic materials (cow dung, urine, leaf mulch).
3. **Biodiversity Integration:** Mix of crops, trees, and livestock.
4. **Soil Health Focus:** Builds organic carbon and microbial life.
5. **Holistic Sustainability:** Promotes local self-reliance and climate resilience.



Techniques

- **Crop Rotation & Intercropping** – restores nutrients, disrupts pests.
- **Mulching & Composting** – retains soil moisture, recycles waste.
- **Agroforestry & Cover Cropping** – enhances biodiversity and income.
- **Bio-inputs** like *Jeevamrit* and *Beejamrit* – boost soil microbes and pest resistance

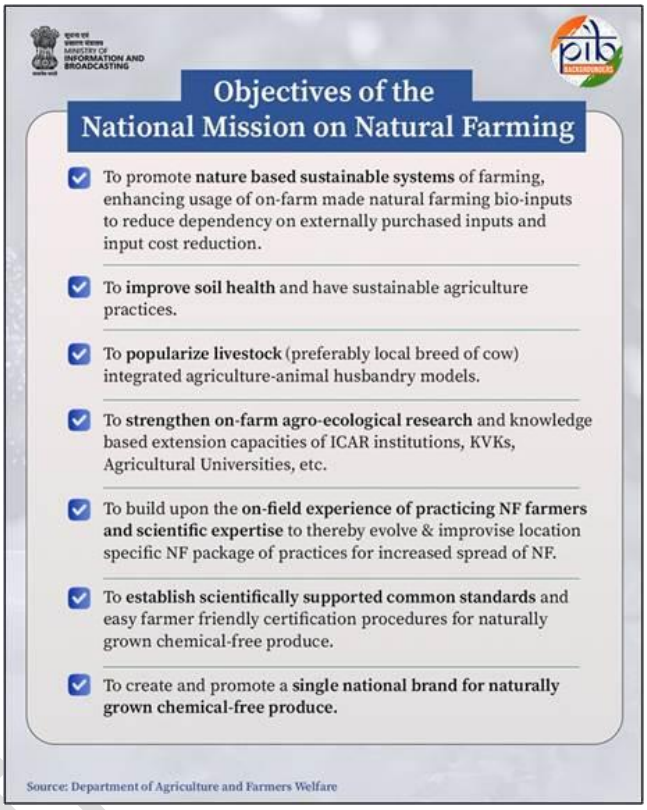
National Mission on Natural Farming (NMNF)

The Union Cabinet approved the **National Mission on Natural Farming (NMNF)** on **25th November 2024,** till the **15th Finance Commission (2025-26),** as a standalone Centrally Sponsored Scheme as a shift to **strengthen agriculture practices** with **scientifically backed approaches** towards sustainability, climate resilience and safe food.

It is aimed towards improving soil health and restoring ecosystems and reducing input cost to the farmer to achieve greater climate resilience.

- **Objective:** Improve **soil health**, restore **ecosystems**, and reduce **input costs** for farmers.
- **Outlay:** ₹2,481 crore (Centre: ₹1,584 crore; States: ₹897 crore).
- **Origin:** Restructured version of **Bharatiya Prakritik Krishi Paddhati (BPKP)** under **Paramparagat Krishi Vikas Yojana (PKVY)** (2020–23).
- **Targets:**

- ✓ 7.5 lakh ha under natural farming across **15,000 clusters**.
- ✓ Establish **10,000 Bio-Input Resource Centres (BRCs)**.
- ✓ Awareness among **1 crore farmers**.
- ✓ Promote a **common national brand** for natural produce



Note

National Programme for Organic Production (NPOP):

- Launched in 2001 under the **Foreign Trade (Development and Regulation) Act, 1992**.
- Implemented by **APEDA**, Ministry of Commerce.
- Regulates and promotes **organic farming and exports** through accredited third-party certification.

Implementation Mechanism

- **Cluster Approach:** 125 farmers per cluster (~50 ha).
- **Training & CRPs:** Two *Krishi Sakhis* per cluster for continuous guidance.
- **BRC Role:** Supply of *Jeevamrit, Beejamrit,* compost inputs.
- **Monitoring:** Geo-tagged, real-time evaluation at all administrative levels.
- **Convergence:** Links with Ministries of Agriculture, Rural Development, Panchayati Raj, Ayush, and Cooperation.

Certification Frameworks

System	Managed By	Nature	Recognition
PGS-India	NCONF (MoA&FW)	Community-based, self-declaration	Domestic market
NPOP	APEDA (Min. of Commerce)	Third-party certification	International export compliance

Significance

1. **Climate Resilience:** Enhances soil moisture, biodiversity, and carbon sequestration.
2. **Economic Savings:** Cuts chemical input cost by 70–80%.
3. **Public Health:** Reduces contamination in food and water.
4. **Ecological Restoration:** Prevents runoff, soil erosion, and water table depletion.
5. **Social Empowerment:** Promotes women's participation and local enterprise through BRCs and SHGs.

Concerns and Challenges

- **Economic Viability:** Farmers revert to conventional farming after subsidy ends due to lower short-term returns.
- **Market Linkages:** Limited consumer awareness and premium price realization for natural produce.
- **Certification Barriers:** *PGS* not recognised globally; *NPOP* certification is costly for small farmers.
- **Knowledge Gap:** Requires intensive training and behavioral change.

Comparison of State Natural Farming Models

State	Scheme	istinct Feature
Andhra Pradesh	*AP Community-Managed Natural Farming (APCNF)*	Large-scale SHG-based model; reduced input costs by 80%.
Gujarat	*Sat Pagala Khedut Kalyaan / Pagala for Natural Farming*	Financial aid for cow upkeep & Jeevamrit kits.
Himachal Pradesh	*PK3Y*	Trained >3 lakh farmers; strong linkage with dairy economy.
Rajasthan	*Kheti Mein Jaan Toh Sashakt Kisan*	Focused on arid ecology; subsidy for natural inputs and equipment.

Conclusion: Natural farming in Himachal Pradesh, through PK3Y, represents a grassroots model of eco-friendly and farmer-centric agriculture, complementing the national NMNF framework. If supported by better market access, certification credibility, and continuous capacity building, it can serve as a replicable model for sustainable hill agriculture and a key instrument for India's climate-smart rural transformation.

Is Natural Farming the Same as Organic Farming?

No, natural farming and organic farming are not the same, though they share similarities like avoiding synthetic chemicals and promoting sustainability; natural farming is a more localized, low-input approach, while organic farming follows certified standards and allows some external organic inputs.

Key Similarities

- Both eliminate chemical pesticides, fertilizers, and GMOs to protect soil, health, and the environment.
- Focus on biodiversity, soil health, and eco-friendly practices for long-term sustainability.
- Produce chemical-free food that's nutritious and reduces pollution.

Key Differences

- **Inputs**: Natural farming uses only on-farm resources (e.g., cow dung, mulch) with zero or minimal costs; organic allows certified external inputs like compost or bio-fertilizers.
- **Certification**: Organic requires formal certification (e.g., USDA Organic or NPOP in India) with audits; natural often lacks certification, relying on self-assessment or community trust.
- **Philosophy**: Natural emphasizes harmony with nature and no tillage (e.g., ZBNF by Subhash Palekar); organic is more commercial, permitting tillage and market-oriented practices.
- **Scale and Cost**: Natural is low-budget for small farms; organic can be costlier due to certification and inputs but fetches premium prices.
- **Examples**: Natural: PK3Y in Himachal or APCNF in Andhra; Organic: Certified farms using approved manures worldwide.

37. PSB Consolidation

PSB consolidation refers to the **merger of smaller government-owned banks** with larger, stronger ones to create **fewer but more competitive entities**. It involves unifying operations, assets, and customer bases to improve efficiency, financial health, and global competitiveness.

Historical Evolution

- **Pre-2017:** India had **27 PSBs**, many with overlapping functions and weak balance sheets.
- **2017: SBI merged** with its five associate banks (and Bharatiya Mahila Bank), marking the first major consolidation step.
- **2019–20: 10 PSBs merged into 4 large banks**, reducing the total to **12 PSBs**.
  - Example: *PNB absorbed OBC & United Bank; Canara merged with Syndicate; Union with Andhra & Corporation Bank; Indian Bank with Allahabad Bank.*

As of **October 2025**, the number remains **12**.

Proposed Phased Restart (2025-26 Onwards)

- **Phase 1:** Merge 3–4 smaller PSBs — *Punjab & Sind Bank, UCO Bank, Bank of Maharashtra* — with larger ones by **FY 2025-26**.
- **Phase 2:** Further combine resulting entities to form **2–3 globally competitive banks**.

This revival aligns with the **2021 Public Sector Enterprises (PSE) Policy**, which aims to retain government control only in **strategic sectors** like banking.

Need for Consolidation

1. **Global Competitiveness:** To create Indian banks among the **world's top 20 by assets** (SBI is ~43rd; Chinese banks dominate top 10).
2. **Efficiency & Scale:** Larger entities achieve **economies of scale**, better risk diversification, and stronger credit capacity for big-ticket lending (e.g., infrastructure).
3. **Risk-Taking & Growth Support:** Consolidated banks can support the government's growth push while deepening **financial inclusion**.
4. **Financial Stability:** Post-merger PSBs showed improved profitability and market capitalization (e.g., SBI ≈ ₹7.17 lakh crore).
5. **Policy Alignment:** Enables reduced government micromanagement in **non-core banking** areas while maintaining strategic oversight.
6. **Competitive Pressure:** Smaller PSBs risk being outpaced by **private banks (HDFC, ICICI)** and **foreign entrants** unless strengthened.

Challenges

- Integration of technology platforms, staff, and work culture.
- Short-term service disruption during merger transitions.
- Potential reduction in regional focus or employment concerns.
- Need for improved **governance autonomy** post-consolidation to avoid politicized lending.

Expected Outcomes

- Creation of **globally scalable Indian banks**.
- Strengthened **capital adequacy** and lending power.

- Streamlined **governance structure** with improved accountability.
- Progress toward **Atmanirbhar and digitally resilient** banking infrastructure.

2021 Public Sector Enterprises (PSE) Policy

To redefine the government's role in business by **minimizing its presence in non-strategic sectors** and focusing on **strategic national priorities** as part of the *Atmanirbhar Bharat* reform agenda.

Key Features of the 2021 PSE Policy

1. **Categorization of Sectors**

Strategic (4 Sectors):

(i) Atomic Energy, Space & Defence

(ii) Transport & Telecommunications

(iii) Power, Petroleum, Coal & Minerals

(iv) Banking, Insurance & Financial Services→ Government retains **minimum but essential presence**.**Non-Strategic:** All other sectors targeted for **privatisation, merger, or closure**.

Privatization and Disinvestment:

- In non-strategic sectors, PSEs will be privatized or closed unless justified by exceptional circumstances.
- In strategic sectors, the number of PSEs will be minimized through mergers, consolidations, or privatization, retaining only a few critical entities.
- A target was set to privatize at least one PSE annually and reduce government stakes in others via disinvestment (e.g., Initial Public Offerings or Offer for Sale).

Aspect	PSB Consolidation	2021 PSE Policy
Purpose	Create strong, globally competitive public banks	Reduce govt. presence, focus on strategic sectors
Approach	Mergers & operational integration	Privatisation, mergers, or closure
Strategic Relevance	Banking retained under strategic sector	Defines boundaries of govt. role
Outcome Expected	Fewer, stronger PSBs supporting growth	Efficient, self-reliant public enterprise ecosystem

38. Gold Monetisation Scheme (GMS)

Launched: November 2015 by Government of India (Ministry of Finance) and **Implemented by** Banks under RBI guidelines

What is the Gold Monetisation Scheme?

- GMS allows individuals, trusts, and institutions to **deposit idle gold** (jewellery, coins, bars) with banks and **earn interest in gold units**. It brings unused gold into the formal system and reduces dependence on imports.

Main Objectives

1. **Mobilize idle gold:** Encourage households and institutions to deposit their unused gold with banks.
2. **Reduce gold imports to save** foreign exchange.
3. **Lower Current Account Deficit (CAD):** Reducing gold imports helps narrow the CAD.
4. Use gold productively for jewellers, refiners, or government reserves.
5. Offer tax-free returns to depositors.

Features of Gold Monetisation Scheme (GMS):

- **Minimum Deposit:** 10 grams of gold; no upper limit
- **No Upper Limit for Deposit:** Individuals and institutions can deposit any quantity of gold without restrictions.
- Interest in Gold: Depositors earn returns in grams, not rupees.
- Purity Testing: Conducted by authorized Collection & Purity Testing Centres (CPTCs).
- Tax Benefits: Interest exempt under the Income Tax Act.

Types of Deposits (Original Structure)

Type of Deposit	Tenure	Purpose	Redemption	Status (as of 2025)
Short-Term Bank Deposit (STBD)	1–3 years	For meeting domestic gold demand and lending.	Gold or Cash	Continues
Medium-Term Government Deposit (MTGD)	5–7 years	Utilised by the government and RBI for gold reserves.	Cash only	Discontinued
Long-Term Government Deposit (LTGD)	12–15 years	Used for monetary policy and reserves.	Cash only	Discontinued

Recent Update (March 25, 2025)

- The **Government discontinued** the **Medium-Term (MTGD)** and **Long-Term (LTGD)** Government Deposit components **with effect from March 26, 2025.**
- **Reason:** Review of performance and changing market conditions showed low participation and limited success.
- **Existing deposits** under these components will continue until maturity.
- **Short-Term Bank Deposits (STBD)** will continue **at the discretion of banks** based on commercial viability.
- RBI will issue detailed guidelines for the continued operation of STBD.

Sovereign Gold Bond (SGB) Scheme:

Launched: 2015 in **Issued by:** RBI on behalf of the Government of India

Essence: SGBs are **government securities denominated in grams of gold**, allowing investors to gain from gold prices **without holding physical gold**.

Objectives

1. Reduce demand for physical gold and imports.
2. Channel household savings into financial assets.
3. Provide dual benefits gold price appreciation + fixed interest income.
4. Formalize gold investments within the financial system.

Eligibility

- Available to **resident Indians-** Individuals, HUFs, Trusts, Universities, Charitable Institutions.
- **NRIs** not eligible.

Investment Details

- **Denomination:** 1 gram and multiples.
- **Limits (per year):** Individuals / HUFs – up to 4 kg and Trusts / Institutions – up to 20 kg
- **Tenure:** 8 years (exit option after 5th, 6th, or 7th year).
- **Interest:** 2.5% per annum (paid semi-annually), plus market price gains.

In Short

Scheme	Core Idea	Who Benefits	Key Outcome
GMS	Deposit physical gold and earn interest in gold	Households, institutions	Mobilizes idle gold, saves forex
SGB	Invest in paper gold backed by the government	Retail investors	Reduces gold imports, offers safe returns

39. 2025 Nobel Prize in Economics

The **2025 Nobel Prize in Economics** was awarded to **Joel Mokyr, Philippe Aghion, and Peter Howitt** for explaining how innovation drives economic growth.

Mokyr received half the prize, while Aghion and Howitt shared the other half. Their collective work explains why the past 200 years have witnessed sustained global growth after centuries of stagnation and how such growth can continue in the future.

Joel Mokyr:

Mokyr emphasized that innovation thrives when both science and skilled human capital are supported.

- He argued that new ideas become reality only when practical, technical, and commercial knowledge is widespread. Britain achieved early sustained growth because it had many skilled artisans and engineers who could translate theory into practice.
- He recommended governments invest heavily in education and skilling to sustain innovation.
- He also stressed that societies must remain open to change, since innovation creates both winners and losers. Resistance from vested interests can stall progress.

Philippe Aghion:

Aghion urged Europe to balance **competition with strategic policies** for AI, climate action, and defense.

- He and Howitt formalized **"creative destruction"** where new innovations displace older ones into a mathematical model explaining sustained growth.
- Their model shows that firms engage in **R&D** to create patented innovations, but newer firms can replace incumbents by inventing superior products, continuously shifting profits and driving productivity.
- The model helps determine the **optimal level of R&D** investment needed for sustained growth without excessive duplication.

Peter Howitt:

Howitt criticized **trade barriers** like tariffs, noting that such restrictions **slow down the diffusion of innovation** and hinder long-term growth.

How Innovation Drives Growth

Mokyr's Idea:

- Sustained growth depends on a continuous flow of **"useful knowledge"**, which combines **propositional knowledge** (theoretical understanding of why things work) and **prescriptive knowledge** (practical know-how of how to make things work).
- Before the Industrial Revolution, lack of practical know-how hindered progress.
- The scientific revolution of the 16th–17th centuries introduced **experimentation and measurement**, linking theory to practice and enabling breakthroughs in areas like steam engines and metallurgy.
- **Policy Implications:** Train skilled workers and maintain openness to technological and social change.

Aghion and Howitt's Idea:

- Growth occurs through **innovation and creative destruction**, where new products replace old ones.
- Firms invest in R&D to gain monopoly advantages through patents, but continual innovation shifts these advantages.
- **Policy Implications:** Encourage R&D through **targeted subsidies**, but avoid overfunding marginal improvements that yield little real progress.

Why It Matters

The laureates' work explains why economic growth accelerated over the past two centuries and offers a roadmap for the future.

It highlights that **education, openness to innovation, and balanced R&D support** are essential for maintaining long-term, sustainable economic growth in a world shaped by technological change.

40. Critical Minerals in India

What are Critical Minerals?

Critical minerals are essential to India's economic growth, energy transition, and national security, but face high supply risks due to scarcity and geopolitical constraints.

- **Examples:** Lithium, cobalt, nickel, graphite, and rare earth elements (REEs) like neodymium and dysprosium.
- **Applications:** EV batteries, solar panels, wind turbines, semiconductors, and defense systems.
- **India's Context:** 30 minerals have been classified as critical to support **green growth, digital technology, and defense self-reliance** under *Atmanirbhar Bharat*.

Importance

- Clean Energy Goals: Crucial for India's 500 GW renewable target by 2030 and net-zero by 2070.
- Economic Growth: Rapid expansion in EVs (49% CAGR) and battery storage markets boosts mineral demand.
- Industrial & Technological Advancement: Enables semiconductor, AI, and defense manufacturing, enhancing global competitiveness.
- National Security: Reduces import dependence and ensures supply-chain resilience amid global volatility.

Challenges Faced by India in Securing Critical Minerals

1. High Import Dependence: Near-total reliance on imports for lithium, cobalt, nickel, and REEs.
2. Processing & Refining Gaps: China dominates ~85% of global REE processing.
3. Slow Domestic Exploration: Regulatory and cost barriers delay projects despite reserves in J&K, Rajasthan, and Odisha.
4. Technology & Investment Constraints: Limited advanced mining and private participation.
5. Recycling Limitations: Only ~10% of e-waste recycled; low mineral recovery.
6. Geopolitical Risks: Vulnerability to supply disruptions and export bans from dominant suppliers.

Steps Taken to Meet Critical Minerals Demand in India

Policy Reforms

- MMDR Act Amendments (2023/2025): Opened critical mineral exploration to private sector.
- Zero Customs Duty (2025-26 Budget): Waived import tax on 12 minerals to cut costs and promote local use.

Exploration

- Lithium Discovery (J&K, 2023): 5.9 million tonnes inferred reserves identified.
- 2024 Block Auctions: 20 blocks of lithium, graphite, and REEs auctioned to Indian and foreign firms.

National Critical Mineral Mission (NCMM)

- Launched January 2025: ₹34,300 crore allocation for exploration-to-recycling ecosystem.
- Objective: Build domestic supply chains and cut import dependency.

Recycling Initiatives

- Battery Waste Management Rules 2022: Mandatory recovery of lithium and cobalt.
- E-Waste Management Rules 2022: Promotes urban mining from electronic waste.

Global Partnerships

- KABIL (2019): Securing overseas mineral assets (e.g., lithium in Australia).
- Quad & Minerals Security Partnership: Joint exploration, tech sharing, and strategic stockpiling with the U.S., Japan, and others.

Investment and Infrastructure

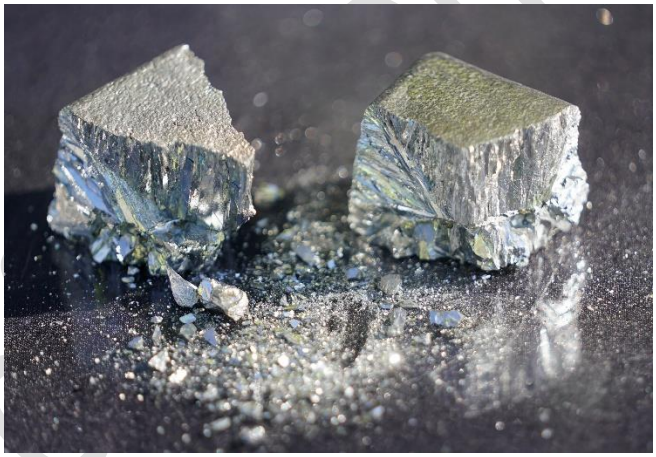
- ₹16,300 crore Investments: For exploration and refining capacity (target 50,000 tonnes by 2030).
- Public–Private Collaboration: To set up processing and recycling hubs.
- NMDC & IREL Expansion: Diversifying into REE and lithium extraction domestically.

Critical minerals are the **new oil of the 21st century**, anchoring India's clean-energy transition, industrial self-reliance, and global strategic positioning.

National Critical Mineral Mission (NCMM)

Launched in **2025**, the **National Critical Mineral Mission (NCMM)** aims to make India **self-reliant in critical minerals** vital for clean energy, electronics, and defense. The **Geological Survey of India (GSI)** will conduct **1,200 exploration projects (2024–25 to 2030–31)** to identify key reserves like lithium, cobalt, and rare earths.

A **2022 Ministry of Mines committee** identified **30 critical minerals**, of which **24 were added to Part D of Schedule I of the MMDR Act, 1957**. This amendment gives the **Central Government exclusive authority** to **auction mining leases and licenses**, ensuring faster approvals, better regulation, and strategic control over India's critical mineral resources.



41. India's Mission for Aatmanirbharta in Pulses

Background:

India is the **world's largest producer and consumer of pulses**, yet remains dependent on imports. Pulses contribute **20–25% of dietary protein**, but per capita intake (~47 g/day) is below the **recommended 85 g/day**.

The **Mission for Aatmanirbharta in Pulses (2025–31)**, announced in **Union Budget 2025–26** and approved on **1 October 2025**, aims to achieve **self-sufficiency by December 2027** in major pulses are **Tur (Arhar), Urad, and Masoor** through area expansion, productivity gains, and value-chain development

Production and consumption

- **Total production (2024–25):** 25.2 million tonnes; target **35 million tonnes by 2030–31**.
- **Major pulses:** Gram (47%), Tur (15%), Moong (12%), Urad (10%), Masoor (5%).
- **Top states:** Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, Karnataka.
- **Cultivation area:** 27.5 million ha → target 31 million ha by 2030–31.
- **Over 60%** of pulses grown in **Rabi season**

Why Self-Reliance Is Needed

1. Import Reduction: 47.38 lakh tonnes imported (2023–24) → foreign exchange savings.
2. Soil & Fertilizer Benefits: Pulses fix nitrogen, saving ~₹8,800 crore in subsidies and improving soil health.
3. Curb Protein Inflation: Boosts domestic availability to check price rise in Tur/Urad dals.
4. Industrial Growth: ₹11,440 crore outlay to develop seed systems, processing hubs, and FPO-led clusters.
5. Water Efficiency: Use 80% less water than rice/sugarcane — vital for dry zones.
6. Crop Diversification: NITI Aayog suggests expanding pulses in rice fallows to add ~2.85 million tonnes annually.

Crop-Wise Contribution to Total Pulses Output

Pulse Crop	Share in To Production (%)	Key Producing States	Notes
Gram (Chickpea)	≈47%	Madhya Pradesh, Rajasthan, Maharashtra	Grown mainly in rabi season; used widely in Indian diets
Tur (Pigeon Pea/Arhar)	≈15%	Maharashtra, Karnataka, Madhya Pradesh	A key kharif crop; important for dal production
Moong (Green Gram)	≈12%	Rajasthan, Maharashtra, Karnataka	Short duration crop; used for intercropping
Urad (Black Gram)	≈10%	Madhya Pradesh, Tamil Nadu, Uttar Pradesh	Widely used in southern cuisine
Masoor (Lentil)	≈5%	Uttar Pradesh, Madhya Pradesh, Bihar	Popular winter crop
Others (Peas, Moth Bean, Lathyrus, etc.)	≈11%	Varied	Contribute minor but regionally significant output

- Per capita net availability (FY 2023): 17.2 kg per year.i.e. Equivalent to ~47 grams per person per day.
- This is below the recommended level of 85 grams/day suggested by the National Institute of Nutrition (NIN).

- **Imports Masoor dal (has largest share)**

Quick Facts Summary

Parameter	Status (2024–25)	Target (2030–31)
Total Area	27.5 million ha (275 Lha)	31 million ha (310 Lha)
Total Production	25.2 million tonnes	35 million tonnes
Productivity	~950 kg/ha	1,130 kg/ha
Imports	47.38 lakh tonnes	0 (self-sufficiency goal)
Major Crops	Tur, Urad, Moong, Masoor, Chana	Same (with expanded cultivation)

Why Self-Reliance Is Needed

1. **Import Reduction:** 47.38 lakh tonnes imported (2023–24) → foreign exchange savings.
2. **Soil & Fertilizer Benefits:** Pulses fix nitrogen, saving ~₹8,800 crore in subsidies and improving soil health.
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6. **Crop Diversification:** NITI Aayog suggests expanding pulses in rice fallows to add ~2.85 million tonnes annually.

Challenges

- 85% farmers small/marginal; limited irrigation and credit.
- Poor mechanization → 10–12% post-harvest losses.
- Low MSP procurement compared to rice/wheat.
- Price volatility (cobweb cycle).
- Long duration and low yield of Tur/Urad (250–270 days).
- Dependence on rainfed areas (Maharashtra, Karnataka).

Government Measures

- **National Food Security Mission (NFSM)** – since 2007, targets +2 million tonnes pulses.
- **PM-AASHA (2018, extended 2024):**
    - ✓ PSS – Direct MSP procurement (expanded to 9 states).
    - ✓ PDPS – MSP-market price compensation.
    - ✓ PSF – Buffer stock for price stability.
- **Procurement Surge:** +7,300% (2009–2025) via NAFED/NCCF.
- **Digital Reforms:** e-Samriddhi and SATHI portals for MSP and seed tracking.
- **Contract Farming:** NCCF provides inputs + buys back produce.
- **Mission for Aatmanirbharta (2025–31):** 35 L ha expansion, 126 L q seeds, 1,000 processing units (@₹25 L subsidy/unit).

NITI Aayog (2025) Recommendations

- Cluster-based farming in rice fallows (Rajasthan, MP).
- "**One Block – One Seed Village**" for seed supply.
- Strengthen MSP procurement and processing infra.
- Include pulses in PDS and Mid-Day Meals to fight malnutrition.
- Promote mechanization, micro-irrigation, bio-fertilizers & short-duration varieties.

In essence:

The Mission for Aatmanirbharta in Pulses (2025–31) seeks to make India **self-sufficient in protein security**, cut imports, boost farmer income, and transform India from a net importer to a **global hub for pulse production and processing** a key step toward Aatmanirbhar Bharat @ 2047

UPSC Prelims 2020

With reference to pulse production in India, consider the following statements:

1. Black gram can be cultivated as both Kharif and Rabi crop.
2. Green gram alone accounts for nearly half of pulse production.
3. In the last three decades, while Kharif pulses production has increased, Rabi pulses production has decreased.

Which of the statements given above is/are correct?

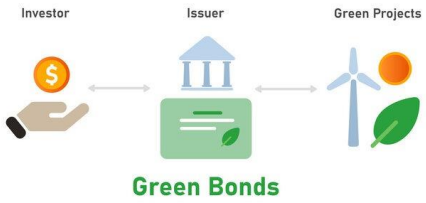
(a) 1 only
(b) 2 and 3 only
(c) 2 only
(d) 1, 2 and 3

Correct answer : 1 Only

42. Sovereign Green Bonds (SGrBs)

1. What are Sovereign Green Bonds (SGrBs)?

- **Definition:** Debt instruments issued by the **government** to raise funds exclusively for **eco-friendly and climate-resilient projects**.
- **Purpose:** Mobilize capital for **low-carbon development**, promote renewable energy, and fund climate-resilient infrastructure.
- **Issuing Authority:** Government of India through **Ministry of Finance**, with oversight from **Department of Economic Affairs (DEA)**.



2. Difference from Regular Green Bonds

Feature	Sovereign Green Bonds (SGrBs)	Regular Green Bonds
Issuer	Government (Central)	Corporates, Banks, or Municipalities
Guarantee	Sovereign-backed	Not sovereign-backed
Risk	Low-risk	Higher risk depending on issuer
Objective	Funding public green projects	Can fund private green projects

3. Eligible Investors

- **Domestic investors**: Retail investors**,** Banks, insurance companies, mutual funds, pension funds, corporates.
- **Foreign investors:** Global climate-focused funds, ESG investors.
- **NRIs:** Permitted to invest through the **RBI's approved routes**.

4. Projects Covered

1. **Electric Locomotive Manufacturing** – energy-efficient three-phase locomotives.
2. **Metro & Public Transport** – sustainable urban mobility and metro rail expansion.
3. **Renewable Energy** – solar, wind, and **National Green Hydrogen Mission**.
4. **Afforestation** – **National Mission for a Green India**.
5. Other **climate-resilient infrastructure projects** aligned with India's Net Zero 2070 target.

5. Key Features

- **Dedicated use of proceeds:** Funds exclusively for green projects; ensures transparency and accountability.
- **Interest Rate (Greenium):** Slightly lower yields than conventional bonds; India's greenium currently weak.
- **Foreign investor participation:** Allowed to enhance demand and integrate with global green finance.
- **Secondary market:** Limited liquidity; bonds often held till maturity.
- **SLR & Repo eligibility:** Can be **eligible for SLR and repo operations**, subject to RBI notification.
- **Part of Green Finance Framework:** Aligns with India's climate goals and **international green bond standards**.

6. Taxation and Returns

- **Tax status:** There are **no specific tax benefits** provided for investment in sovereign green bonds.

7. Exceptions / Not Eligible

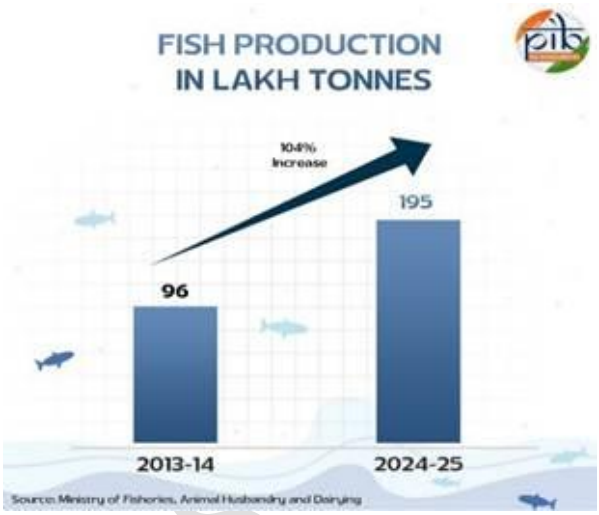
- Projects not aligned with **sustainability or low-carbon objectives**.
- Certain high-risk private-sector green bonds may not qualify as SGrBs.
- Hydropower projects greater than 25MW, Nuclear power, Direct waste incineration, Landfill project, Fossil Fuels

43. Blue Revolution

Blue Revolution → Blue Revolution 2.0 → PMMSY

Blue Revolution (1985–1990)

- Launched during the **7th Five-Year Plan**.
- Focus: **Increase fish production**, modernize aquaculture, and enhance fisher incomes.



Blue Revolution 2.0 (Neel Kranti Mission, 2015–16)

- Modern phase launched in **2015–16** (₹3,000 crore, 5 years).
- Covered **inland aquaculture, deep-sea fishing, mariculture, and value chain improvements**.
- Addressed productivity and infrastructure gaps but faced issues in post-harvest handling, credit access, and traceability.

Pradhan Mantri Matsya Sampada Yojana (PMMSY, 2020–2025)

- **Launched:** September 2020 **Outlay:** ₹20,050 crore (CS ₹1,720 cr + CSS ₹18,330 cr).
- **Target:** Fish production 22 million tonnes by 2024–25; create 55 lakh jobs.
- Builds on Blue Revolution gains for **sustainable, inclusive aquaculture** and stronger **value chains**.

Objectives

- Harness fisheries sustainably and equitably.
- Enhance productivity and exports.
- Modernize post-harvest management.
- Double fishers' income and improve GVA share.
- Strengthen welfare, regulation, and resilience.

Major Initiatives

Component	Purpose
Fish Farmer Producer Organisations (FFPOs)	Market linkages, group credit, Kisan Credit Cards for ~28 million fishers.
Fisheries & Aquaculture Infrastructure Development Fund (FIDF)	Develop harbours, cold storage, logistics.
Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PMMKSSY)	Support small-scale fish enterprises.
Integrated Aqua Parks	Combine hatcheries, farms, and processing.
Artificial Reefs & Sea Ranching	Restore marine biodiversity and stocks.

Challenges

- **Overfishing & Pollution:** 30% of coastal species overexploited.
- **Infrastructure gaps:** 20–25% post-harvest losses.
- **Climate stress:** Warming seas, rising levels.
- **Land & seed constraints**, limited credit and trawler modernization.
- **Trade issues:** High U.S. tariffs, subsidy competition from developed nations.
- **Ethical dilemmas:** Growth vs environmental sustainability.

Government Measures & Technology Use

- **Budget 2025-26:** Framework for sustainable fishing in **EEZ and High Seas** (Lakshadweep, A&N Islands).
- **Satellite & GIS Integration:** Oceansat data, PFZ forecasting, GIS-based landing-centre mapping.
- **National Policy on Marine Fisheries (2017):** Anchored in sustainability.
- **Uniform 61-Day Monsoon Fishing Ban** for stock replenishment.
- **Bans on destructive methods:** Pair/bull trawling, LED lights.
- **Promotion of mariculture:** Seaweed, mussel, and oyster farming.
- **State Regulations:** Mesh size limits, minimum legal size, zonation of vessels.

Global Context – WTO Fisheries Subsidy Agreements

Fish 1 (Adopted 2022, In Force 2025)

- WTO's **first environmental sustainability agreement**.
- **Bans subsidies** for:

1. **Illegal, unreported, unregulated (IUU)** fishing.
2. Fishing of **overfished stocks** (unless recovery plan).
3. **High-seas unregulated** fishing.

- Urges "**restraint**" where stock status is unknown (≈35% unassessed).

Fish 2 (Negotiations Ongoing)

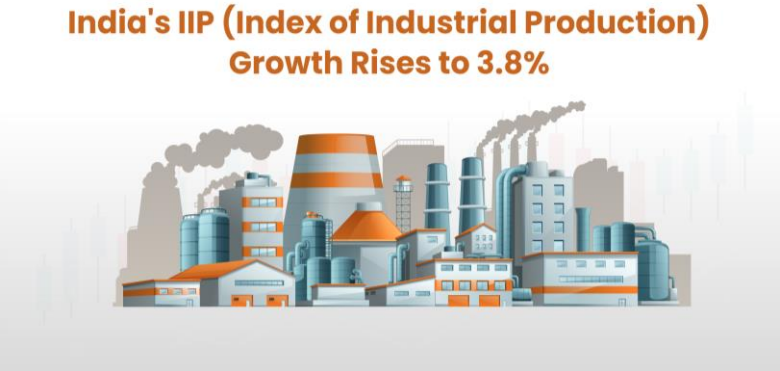
- Will address **subsidies causing overcapacity and over-fishing**, mainly targeting **large subsidisers** (China, EU, US, Japan, S Korea).
- Aims for global **equity and sustainability** in fisheries governance.

India's fisheries have transformed from **production-driven Blue Revolution** to **sustainability-focused PMMSY**, aided by digital and policy innovation. Yet, climate stress, overfishing, and unequal global subsidies remain core challenges for realizing a truly **blue-green economy**.

44. The new Index of Industrial Production (IIP)

The new Index of Industrial Production (IIP) series being developed is aimed at updating India's industrial statistics to reflect structural and technological changes in the economy.

What is the New Series?



The Ministry of Statistics and Programme Implementation (MoSPI) is revising the IIP base year from 2011–12 to 2022–23, in line with the upcoming revision in GDP base year. This ensures that data on industrial output better represents the current production structure of the economy and is internationally comparable.

Why a New Series?

1. Economic Transformation: The structure of India's economy has drastically changed agriculture , now contributes 15% of GVA, services 62.5%, and industry about 22% . The industrial basket must be updated to capture these changes.
2. Technological Shifts: Products like LED bulbs, laptops, mobile devices, electric vehicles, and vaccines have replaced older items (e.g., kerosene lamps, CFL bulbs, printing machinery). The earlier base year no longer reflects these realities.
3. Data Quality and Representation: Many factories included in the older sample have shut or changed production lines. The new system introduces a method for replacing outdated factories and builds a more dynamic database.
4. International Standards: It aligns with the International Recommendations for Index of Industrial Production (IRIIP 2010) and follows the UN norm of revising base years every five years .

Key Features of the 2022–23 Base Year Revision

- **Expanded Coverage**: Incorporates new industrial sectors like gas supply, minor minerals, and waste management.
- **Revised Item Basket**: Adds modern products and removes obsolete ones to reflect current industry consumption and technology.
- **Improved Weighting**: Adjusts sectoral weights using fresh Annual Survey of Industries data for better accuracy.
- **Seasonal Adjustment**: A new "de-seasonalised IIP" will be introduced to smooth monthly fluctuations, aiding better policy forecasting.
- **Integration with GST Data**: Will enhance real-time monitoring and improve short-term industrial forecasting.

Index of Industrial Production (IIP)

The IIP is a **monthly economic indicator** that measures short-term changes in the **volume of industrial production** in India. It reflects how the industrial sector (mining, manufacturing, and electricity) is performing compared with a chosen **base year** (currently 2011–12).

Released by:

National Statistical Office (NSO) under the **Ministry of Statistics and Programme Implementation (MoSPI).**

Frequency: Released **monthly**, about six weeks after the reference month.

Base Year: 2011–12 (revision to 2022–23 underway).
Major Sectors and Weights:

- **Manufacturing:** 77.63%
- **Mining:** 14.37%
- **Electricity:** 7.99%

Purpose:
It helps in assessing industrial health, policy formulation, and GDP estimation before annual surveys or national accounts are available.

Index of Eight Core Industries (ICI)

Meaning: A composite index tracking the performance of **8 major infrastructure industries** that form the foundation of industrial growth.

Released by: Office of Economic Adviser (OEA), **Ministry of Commerce and Industry.**
Frequency: Published **monthly**, usually at the end of the month.
Industries and their Weights in IIP (Total = 40.27%):

1. Refinery Products – 28.04%
2. Electricity – 19.85%
3. Steel – 17.92%
4. Coal – 10.33%
5. Crude Oil – 8.98%
6. Natural Gas – 6.88%
7. Cement – 5.37%
8. Fertilisers – 2.63%

Importance: These core sectors serve as leading indicators of overall industrial activity and GDP growth.

Annual Survey of Industries (ASI)

The ASI is the **most comprehensive annual data source** for India's **organised manufacturing sector**. It provides detailed information on employment, wages, production, input use, capital formation, and investment.
Released by: National Statistical Office (NSO), MoSPI.
Frequency: Conducted **annually.**
Coverage:

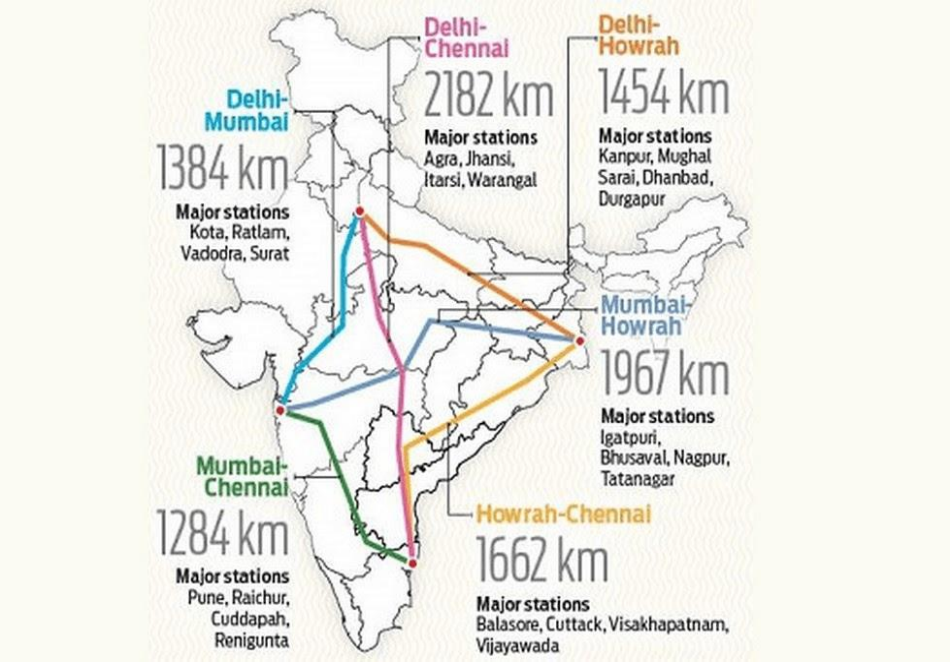
- Factories registered under the **Factories Act, 1948.**
- Includes all units:
    - ✓ Using power and employing 10 or more workers.
    - ✓ Not using power but employing 20 or more workers.
- Excludes defence factories, oil storage depots, restaurants, and small unorganised units.

Purpose:
Provides detailed structural information on the industrial sector, which supports policymaking, investment tracking, and GDP compilation.

45. Golden Quadrilateral 2.0:

The Golden Quadrilateral is a highway network in India that links the country's four largest metropolitan cities: Delhi, Mumbai, Chennai, and Kolkata. This network is India's longest highway project, forming a quadrilateral shape and connecting major economic, agricultural, and cultural centers throughout the country

- Administration: The project is managed by the National Highways Authority of India.
- Historical Context: It was launched in 2001 and completed in 2012, with planning beginning in 1999 under then-prime minister Atal Bihari Vajpayee



What is Golden Quadrilateral 2.0?

- Golden Quadrilateral 2.0 is the second phase of India's original Golden Quadrilateral (GQ) highway network, launched in 2001 under the National Highways Development Project (NHDP).
- The original GQ connected four major cities—Delhi (North), Mumbai (West), Chennai (South), and Kolkata (East)—via a 5,846 km, four/six-lane highway grid, revolutionizing road connectivity at a cost of ~₹309 billion (completed by 2012).
- **New Phase Details**: Announced in 2025 as part of 'Vision 2047' (India's 100-year independence goal), it envisions a ~17,000–20,000 km network of high-speed, access-controlled expressways (6–8 lanes) built parallel to or beyond the existing North-South and East-West corridors. It focuses on linking economic hubs, industrial zones, logistics parks, and ports, with 9,000 km already sanctioned and 10,000 km more by 2027.
- **Funding & Timeline**: Estimated cost ~₹11–20 trillion (₹40 crore/km average), funded via hybrid public-private partnerships (PPP), budgetary allocations, and tolls. Full rollout targeted by 2030–33, emphasizing digital tolling and multi-modal integration (road-rail-port).

Benefits of Golden Quadrilateral 2.0

- **Reduced Logistics Costs**: Aims to cut India's high logistics expenses from 14% to 8% of GDP (aligning with developed nations) by enabling faster freight transit, decongesting highways, and improving supply chains between cities like Delhi-Mumbai-Chennai-Kolkata and emerging hubs (Surat, Nagpur, Hyderabad).
- **Time & Efficiency Savings**: Up to 40% reduction in travel time; boosts freight mobility, reduces agricultural spoilage, and enhances access for Tier-2/3 cities to ports, fostering economic decentralization.
- **Economic Growth & Jobs**: Drive's manufacturing, exports, and real estate along routes; expected to create millions of jobs in construction, logistics, and related sectors, supporting a $10-trillion economy by 2047.
- **Safety & Sustainability**: Access-controlled design improves road safety; promotes lower emissions via efficient routing and EV-ready corridors, encouraging green mobility.
- **Regional Balance**: Extends connectivity to underserved industrial/logistics clusters, promoting balanced development beyond metros and integrating with initiatives like Make in India and PLI schemes.

Scope and Investment

- The Ministry of Road Transport and Highways has already sanctioned 9,000 km of expressways and plans to award another 10,000 km during 2025–27.
- Estimated construction cost can exceed ₹40 crore per km, depending on terrain and land acquisition.
- The project is part of the government's Vision 2047 framework aiming to improve connectivity beyond the original GQ network and foster industrial growth.

46. India's Growth Outlook

- The International Monetary Fund (IMF) has raised India's GDP growth projection for FY 2025-26 to 6.6%, up from 6.4% earlier.
- This makes India the fastest-growing major economy, ahead of China (4.8%), despite global slowdown and higher US tariffs.
- The growth revision was driven by India's strong first-quarter performance (7.8%) and reforms such as GST 2.0, which boosted private consumption and tax efficiency.

2026 Projection

- The IMF expects growth to ease to 6.2% in 2026, anticipating slower momentum after the initial boost.

Key Drivers

1. Resilient Domestic Demand: Strong private consumption and investment continue to power GDP growth.
2. Economic Reforms: Implementation of GST 2.0 and improved tax compliance aid revenue and business activity.
3. Tariff Resilience: High US tariffs on Indian exports have had less impact than expected because of internal market strength.

Global Context

- World economy 2025: Expected to grow at 3.2%, slowing to 3.1% in 2026.
- Advanced economies: Average growth 1.6%.
- Emerging economies: Average growth 4.2%.
- India and Spain lead their respective categories of emerging and advanced economies. .

IMF's Warning Notes

- Global risks include trade protectionism, labour-supply shocks, and financial-market volatility.
- IMF urged governments to rebuild fiscal buffers, preserve central-bank independence, and accelerate structural reforms for stability

RBI recognises that India's economy remains resilient but exposed to

- External headwinds (tariffs, geopolitics, FDI slowdown- net FDI negative),
- Domestic structural constraints (high input costs, slow private investment), and
- financial vulnerabilities (market volatility, cyber risks).
- Raising Global Debt

The central bank's approach for FY26 is "cautious optimism"

47.China to Retain 'Developing Status' but Forgo WTO Benefits

China has announced it will no longer seek Special and Differential Treatment (SDT) in future World Trade Organisation (WTO) agreements, though it will retain its developing country status. This is a significant move since China's economy has grown from USD 1.3 trillion in 2001 (when it joined the WTO) to USD 19 trillion, making it the world's second-largest economy.

WTO Developing Nation Status:

- The WTO allows members to self-declare as "developing" or "developed"—there is no fixed definition, though other members can challenge this status if it's misused.
- SDT provisions give developing and least-developed countries longer timelines, preferential treatment, and technical assistance, helping make trade rules more equitable.
- Declaring as a developing country for the WTO does not guarantee benefits under other schemes like the Generalized System of Preferences (GSP).

China's Decision:

- China's move to forgo SDT is voluntary, not a result of external pressure, and applies only to ongoing and future WTO deals; it will keep its developing country "tag" and past rights.
- The step allows China to present itself as a responsible, major developing country willing to accept higher obligations and strengthen multilateral trade frameworks.

48. India Announces First Cross-Border Rail Links with Bhutan

India announced its **first-ever cross-border railway projects** with Bhutan on September 29, 2025, costing **₹4,033 crore**. These will boost trade, connectivity, and economic ties, with most work on Indian soil. The agreement was signed during PM Modi's 2024 Bhutan visit.

Key Projects

- **Total Length**: 89 km (completion in 4 years).

1. Kokrajhar (Assam) – Gelephu (Bhutan):

- Length: 69 km (2.39 km in Bhutan).
- Cost: ₹3,456 crore.
- Features: 6 stations, 2 major bridges, 100+ minor structures, 2 goods sheds.
- Impact: Supports Bhutan's "mindfulness city" plan in Gelephu; enhances trade (India handles 90% of Bhutan's EXIM).

2. Banarhat (West Bengal) – Samtse (Bhutan):

- Length: 20 km (2.13 km in Bhutan).
- Cost: ₹577 crore.
- Features: 2 stations, 1 major bridge, 24 minor bridges, 1 ROB, 37 RUBs.
- Completion: 3 years; aids southern Bhutan trade routes.

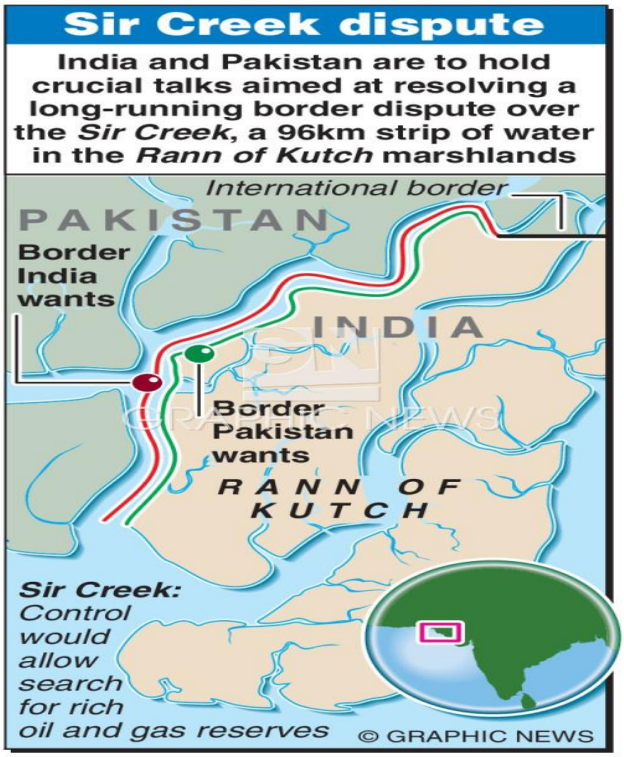
Strategic and Economic Benefits

- **Trade Boost**: Bhutan's exports/imports mostly via Indian ports; seamless rail cuts costs, supports hydropower projects.
- **India-Bhutan Ties**: Reflects "exceptional trust" (Foreign Secretary Vikram Misri); India committed ₹10,000 crore aid for Bhutan's 13th Five-Year Plan (2024–29), double the previous.
- **Geopolitical Context**: Counters China's influence in Bhutan; enhances regional connectivity

49. Sir Creek Dispute

On October 2, 2025, Defence Minister Rajnath Singh warned Pakistan of a decisive response to any misadventure in the 96-km Sir Creek estuary, a disputed region between Gujarat and Sindh. Pakistan's military buildup escalates tensions, highlighting Sir Creek's critical economic and strategic importance.

Overview of Sir Creek



- **Geographical Context:**
  Sir Creek is a **96-km tidal estuary** in the **Rann of Kutch**, opening into the **Arabian Sea**. It serves as a natural boundary between India and Pakistan and is vital for **maritime trade and security**.
- **Disputed Status:**
  India proposes a **mid-channel boundary** based on the *thalweg principle*, while Pakistan claims the **entire creek**. Despite **12 rounds of talks (2004–08)** and a **UN Tribunal decision in 1968**, the dispute remains unresolved.
- **Historical Origin:**
  The dispute traces back to **colonial-era map discrepancies** under the **Maharaja of Kutch**, with varying British administrative interpretations (1914 resolution vs. 1925 map).

Post-1947 Developments

- **1947–1965:** Partition made Sindh part of Pakistan and Gujarat part of India, creating a border along Sir Creek. Earlier (1908–1914) local administrative disputes had already left boundaries ambiguous.
- **1965 War:** Skirmishes broke out in the Rann of Kutch, including Sir Creek. Following India's military success, the issue went to a **UN Tribunal** under the **1965 India-Pakistan Agreement**.
- **1968 Tribunal:** The UN Tribunal awarded **90% of the Rann of Kutch to India**, but **left Sir Creek unresolved**.
- **2004–2025:** Multiple bilateral talks and **joint hydrographic surveys (2005–07)** failed. Pakistan's **military installations (2024–25)** near the creek escalated tensions, prompting India to establish a **Joint Coastal Control Centre (2025)** to enhance security.

Nature of the Sir Creek Dispute

- **Post-Partition Origins:**
  The 1968 Tribunal failed to demarcate Sir Creek's boundary, leaving a **96-km stretch undefined**.
- **India's Position:**
  India relies on a **1925 map** and advocates the **thalweg principle** (mid-channel line) as per **international maritime law**, arguing Sir Creek is navigable and thus eligible for this rule.
- **Pakistan's Claim:**
  Pakistan bases its claim on a **1914 Bombay Presidency resolution**, asserting the **eastern bank** as the boundary and rejecting the thalweg principle for tidal estuaries.

- **Negotiation Stalemate:**
  Twelve bilateral rounds (2004–08) and technical surveys failed to yield consensus. Both sides insist on sequencing (India wants sea boundary first; Pakistan, land boundary), perpetuating the deadlock.

Importance of Sir Creek

- **Oil and Gas Reserves:**
  Estimated **100 million barrels of hydrocarbons (ONGC, 2023)** make it economically significant. Control affects the delineation of **Exclusive Economic Zones (EEZs)** and resource rights.
- **Fisherfolk Livelihoods:**
  Roughly **500 Indian and Pakistani fishers** are detained annually for inadvertent border crossings, affecting over **10,000 families** dependent on fishing in Gujarat and Sindh.
- **Strategic Trade Routes:**
  Its proximity to **Kandla Port** and **Arabian Sea shipping lanes** makes it vital for **maritime security and trade**.
- **Geopolitical Advantage:**
  Dominance over Sir Creek strengthens India's **strategic posture** against Pakistan and **China's CPEC-linked presence** in Sindh, aligning with India's **Blue Economy target of ₹50 lakh crore by 2030**.

50. South-South & Triangular Cooperation (SSTC)

SSTC refers to partnerships among developing countries (South-South) and collaborations involving developed nations or organizations (Triangular), promoting shared growth and solutions. Recognized on September 12 as UN Day for SSTC, it stems from the 1978 Buenos Aires Plan of Action (BAPA) and addresses global challenges like climate change and inequality

Background of SSTC

- **Origins**: Began with BAPA (1978), a UN plan for technical cooperation among developing nations. It emphasizes solidarity, mutual respect, and shared learning.
- **UN Recognition**: Marked annually on September 12 since 2011. Now vital amid declining North-South aid, focusing on cost-effective, replicable solutions.
- **Principles**: Based on equality and mutual benefit, helping Global South nations tackle issues like food insecurity and funding gaps.

What is SSTC?

- SSTC (South-South and Triangular Cooperation) is a framework for collaboration among developing countries, supported at times by developed nations or agencies, to advance sustainable development.
- It embodies the principles of solidarity, mutual respect, shared learning, and is recognized by the UN annually on September 12.

Significance of SSTC

- SSTC is a vital complement to traditional aid, providing cost-effective, contextually relevant, and replicable solutions to shared global challenges like climate change, food security, and inequality.
- It allows for greater ownership and mutual benefit, offering better returns on investment and more adaptable approaches for humanitarian and development sectors.
- The approach promotes innovation, knowledge-sharing, and building of robust partnerships, leading to sustainable frameworks and solutions beyond monetary assistance.

India's Role in SSTC

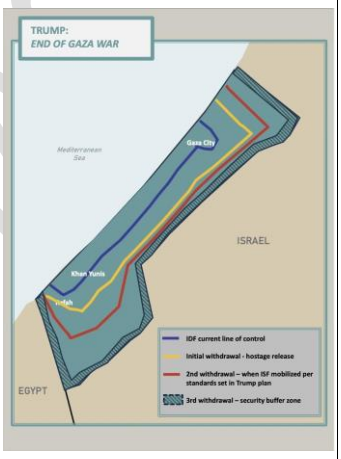
- India champions SSTC guided by "Vasudhaiva Kutumbakam" (the world is one family), focusing on mutual respect, inclusivity, and practical cooperation.
- India has established the India-UN Development Partnership Fund, provided public digital infrastructure globally, and become a source of tailored, low-cost solutions (e.g., Aadhaar, UPI).
- India is a hub for innovation in food security, notably through partnerships with WFP on projects like the Annapurti/Grain ATM, women-led Take-Home Ration, and nutrition optimization, which serve as replicable models for others.
- India actively supports SSTC initiatives by contributing to global platforms and driving development-focused projects in over 60 countries, building technical capacity and supporting LDCs (Least Developed Countries) and SIDS (Small Island Developing States).
- India's leadership in SSTC reflects a commitment to a more equitable and sustainable global future, enhancing South-South solidarity and promoting large-scale transformational impact.

51. Trump's Gaza Peace Plan

Overview

Unveiled on **September 29, 2025**, during a **White House meeting with Israeli PM Benjamin Netanyahu**, Trump's *20-Point Gaza Peace Plan* seeks to **end the Israel–Hamas war** through an *immediate ceasefire, hostage release,* and *reconstruction of Gaza*.

It envisions a **"New Gaza"** a **technocratic, demilitarized economic zone**, governed without Hamas. Supported by **Arab nations, the EU, India**, and others, the plan reflects a major **multilateral effort for regional stability**.



Context

- Follows the **2023–25 Israel–Hamas war**, which killed **over 40,000 Palestinians** and **1,200 Israelis**, with peace talks at a standstill.
- Trump positioned himself as a **peace broker**, giving **Hamas a deadline of October 5, 2025**, to accept or face "consequences."
- The plan draws on **Biden's 2024 framework** and **Saudi–French peace ideas**.
- **Hamas conditionally accepted** (October 3, 2025) while demanding a **complete Israeli withdrawal**.

What is the Gaza Peace Plan?

- A **U.S.-led diplomatic framework** to stop fighting, secure hostage release, and rebuild Gaza.
- Establishes a **"Board of Peace"**, chaired by **Donald Trump** and **Tony Blair**, to oversee **governance, funding, and reconstruction** during transition.

Governance Structure

- Gaza to be managed by a **temporary technocratic Palestinian committee**, including **local professionals and international experts**.
- Responsible for **public services, administration, and municipal governance**, under oversight of the **Board of Peace**.
- The **Palestinian Authority (PA)** will assume control after completing institutional reforms.

Exclusion of Hamas

- **No role** in governance or security for **Hamas or affiliated groups**.
- **Amnesty** for disarmed militants under a **reintegration programme**.

Demilitarisation

- **All tunnels, weapons, and military infrastructure** to be **dismantled and permanently disabled**.
- **Independent international monitors** to verify disarmament.
- A **global arms buyback fund** will finance rehabilitation of ex-combatants.

Transitional Vision

- Gaza will emerge as a **peaceful, demilitarized, and economically vibrant zone** under international supervision aligned with **Trump's 2020 peace plan** and **the Saudi–French roadmap**.

Key Features

Feature	Description
1. Immediate Ceasefire	Israeli operations halt once Hamas agrees; Rafah crossing reopens under 2025 aid accord.
2. Hostage–Prisoner Swap	Hamas releases all hostages (within 72 hours); Israel frees over 2,000 Palestinian detainees.
3. No Forced Displacement	Palestinians cannot be expelled; voluntary relocation and return guaranteed.
4. Exclusion of Hamas	Disarmed members get amnesty; UN–Arab monitored demilitarisation and buyback scheme.
5. Board of Peace	Trump–Blair-led body to oversee governance, funding, and reform implementation.
6. International Stabilisation Force	Arab-led multinational force for security, rubble clearance, and police training.
7. Economic Zone ("New Gaza")	Reconstruction as an economic hub with incentives for trade, investment, and jobs.
8. Conditional Statehood	Palestinian statehood tied to reforms; no fixed timeline but emphasizes coexistence and interfaith dialogue.

Positives / Potential Gains

- **Humanitarian Relief:** Immediate ceasefire, aid flow, and access to essentials could save thousands of lives.
- **Hostage Resolution:** Full exchange improves trust and stability; endorsed by Israel and allies.
- **Broad Support:** Backed by **EU, India, Arab states**, unlocking **$10.9 million WFP funding** for rebuilding.
- **Reconstruction Focus:** The "New Gaza" model aligns with **Saudi–French two-state economic pathway**.
- **Global Oversight:** Reduces mistrust; monitored amnesty and demilitarisation encourage peace transition.

Challenges / Concerns

- **Hamas Acceptance:** Conditional support hinges on Israeli withdrawal; rejection could reignite conflict.
- **Israeli Resistance:** Netanyahu remains opposed to Palestinian statehood; security concerns persist.
- **Implementation Issues:** Prisoner swaps, aid logistics, and verification of demilitarisation are complex.
- **Political Instability:** Hamas–PA rivalry and Israeli domestic politics could derail the plan.
- **Vague Statehood:** Lacks clear mechanism or timeline for Palestinian sovereignty.

What is Hamas and What Are Its Goals?

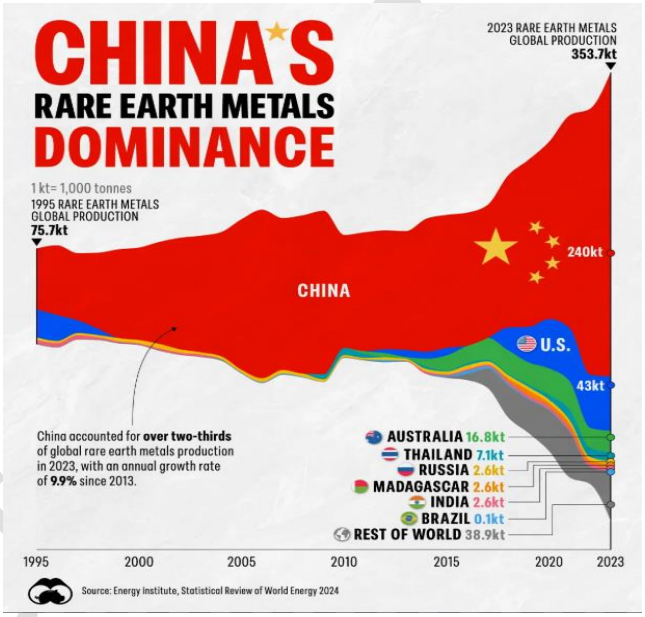
- **Origin:** Founded in **1987** as an offshoot of the **Muslim Brotherhood**; stands for *Harakat al-Muqawama al-Islamiyya* (Islamic Resistance Movement).
- **Ideology:** Seeks an **Islamic state in place of Israel**, across **Gaza, West Bank, and East Jerusalem**.
- **Position Shift:** Has shown **conditional willingness** to accept an interim Palestinian state (without renouncing full claims).
- **Strength:** Estimated **30,000 fighters pre-2023**; Israel claims over **17,000 killed** by 2024 (unverified).
- **Control:** Took power in **Gaza in 2007**, ousting the PA; but current war has **crippled its military and administrative network**.

52. China's Rare Earth Export Restrictions

China dominates global rare earth production, handling over 90% of processed rare earths and magnets used in products like electric vehicles, aircraft engines, and military radars. On October 14, 2025, the Ministry of Commerce expanded export restrictions to 12 of the 17 rare earth elements by adding five new ones: holmium, erbium, thulium, europium, and ytterbium, along with related materials. These silvery elements have key applications in nuclear, defense, medicine, and fiber-optics sectors, potentially impacting global supply chains.

Five Newly Restricted Elements

- **Holmium**: Used in magnets, semiconductors, laser surgery devices, and nuclear reactor control rods.
- **Erbium**: Primarily applied in fiber-optic telecommunications and infrared technology; its pink oxide makes infrared-absorbing glass.
- **Thulium**: Employed in X-ray equipment, laser technology, and microwave ceramics; fluoresces under UV light for anti-counterfeiting.
- **Europium**: The most reactive rare earth; used in nuclear reactor control rods, medical imaging, and magnetism research (with ytterbium); also fluorescent.
- **Ytterbium**: The most volatile rare earth; serves as a radiation source in X-ray machines, nuclear medicine, catalysts, and quantum computers.



UPSC 2012 Prelims: Rare Earth Metals

Recently, there has been a concern over the short supply of a group of elements called 'rare earth metals'. Why?

1. China, which is the largest producer of these elements, has imposed some restrictions on their export.
2. Other than China, Australia, Canada and Chile, these elements are not found in any country.
3. Rare earth metals are essential for the manufacture of various kinds of electronic items and there is a growing demand for these elements.

Which of the statements given above is/are correct?

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

II. With reference to India, consider the following statements (2022)

1. Monazite is a source of rare earths.
2. Monazite contains thorium.
3. Monazite occurs naturally in the entire Indian coastal sands in India.
4. In India, Government bodies only can process or export monazite.

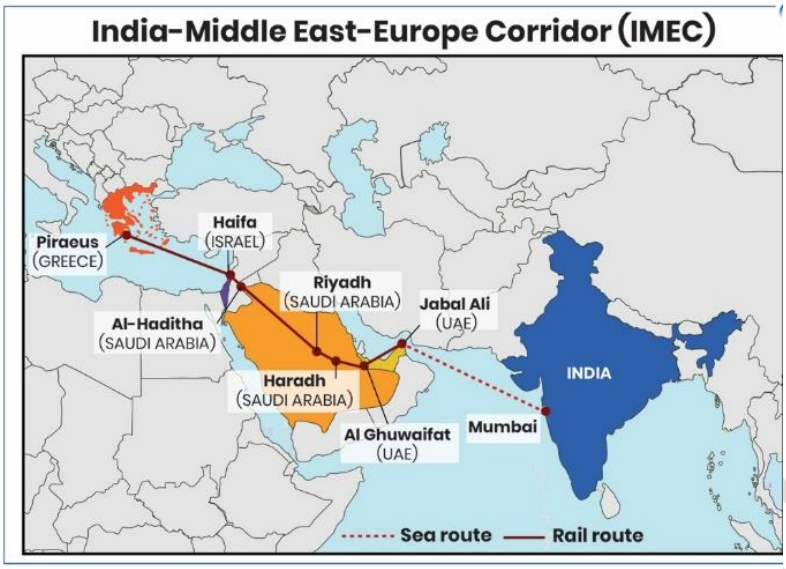
Which of the statements given above are correct?

(a) 1, 2 and 3 only
(b) 1, 2 and 4 only
(c) 3 and 4 only
(d) 1, 2, 3 and 4……Answers 1.C & 2.B

53. IMEC

India–Middle East–Europe Economic Corridor (IMEC)

The IMEC is a strategic connectivity initiative launched at the G20 Summit 2023 to link India with Europe via the Middle East. It aims to integrate **trade, transport, energy, and digital networks** by connecting Indian ports with the Gulf (UAE, Saudi Arabia), Israel, and onward to Europe through **railways, shipping routes, pipelines, and digital infrastructure**.



Historical Background

IMEC emerged from improved West Asian relations after the **Abraham Accords**, which fostered cooperation between **Israel, UAE, and Saudi Arabia**. Supported by frameworks like **I2U2 (India, Israel, UAE, U.S.)**, and India's balanced ties with both Arab nations and the West, it culminated in the corridor's formal launch at the **G20 Delhi Summit 2023**, with the **EU, France, Germany, and Italy** joining as key partners.

Importance of the Mediterranean Route

- IMEC plans to link Haifa (Israel) with European ports through **high-speed rail and maritime routes**.
- The **Mediterranean remains vital** for Europe's trade, especially for Italy and other southern European economies.
- Amid **Red Sea disruptions** (like Houthi attacks), IMEC's Mediterranean path offers a **reliable alternative** to the Suez Canal route.
- For India, the **Mediterranean route** aligns better with its commercial interests than the Arctic, ensuring sustained trade access to Europe.

The Arctic Route Debate

- Melting Arctic ice is opening new **Northern Sea Routes**, benefiting nations like **Russia, the U.S., China, and northern Europe**.
- **Mediterranean nations** fear losing trade influence as shipping could shift northward.
- For **India**, Arctic routes offer limited benefit; its geography and trade networks favor the **Mediterranean corridor**.
- Thus, IMEC helps **India and Mediterranean economies** retain global maritime significance against Arctic competition.

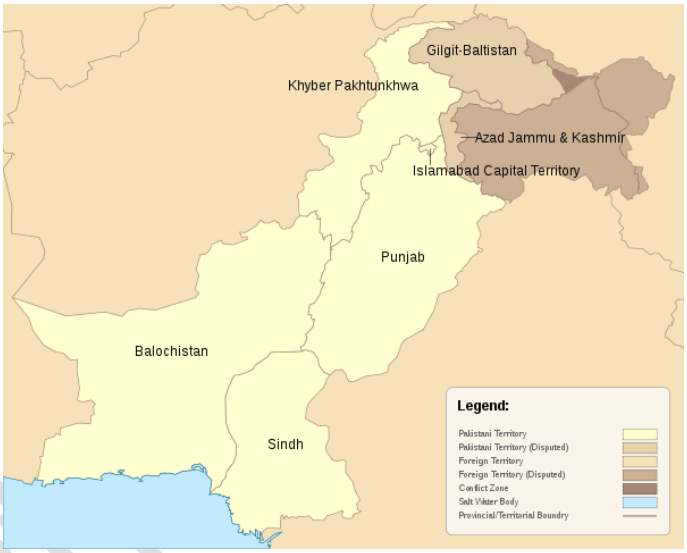
Why IMEC is Important

- Enhances **India–West Asia–Europe connectivity** while mitigating risks from volatile sea lanes such as the Red Sea.
- Expected to **cut transport costs by 30%** and **reduce time by 40%** compared to the Suez route.
- Integrates **green energy (hydrogen/electricity)** and **digital corridors**, promoting sustainable trade.
- Strengthens **India–Arab relations**, limits rival influence in West Asia, and reinforces **India's strategic role** in global trade and supply chains.

54. Pakistan Provinces and Conflict with Afghanistan

Background: When the **Taliban seized Kabul in 2021**, Pakistan initially celebrated, assuming it had finally secured a **friendly government** after decades of nurturing the group. However, this optimism soon faded. The **Tehrik-e-Taliban Pakistan (TTP)** ideologically aligned with and sheltered by the Afghan Taliban intensified **cross-border attacks**, particularly in **Khyber Pakhtunkhwa** and **Balochistan**.

By **2025**, Pakistan recorded over **2,400 deaths** due to militancy, underscoring how its long-standing "strategic depth" policy had backfired.



Immediate Cause of the 2025 Conflict

- On **October 9, 2025**, Pakistan conducted **airstrikes in Kabul and Kandahar**, claiming to target **TTP hideouts**.
- The **Afghan Taliban condemned** the strikes as a **violation of sovereignty** and retaliated by **attacking Pakistani border posts** along the **Durand Line**.
- A week of **artillery and drone exchanges** followed, killing dozens. A **Qatar- and Turkey-brokered ceasefire** eventually halted fighting, but tensions remain high.

Structural Causes and Context

1. **Terror Haven Issue**
   - Pakistan accuses the Afghan Taliban of **harbouring the TTP**, which seeks to re-impose strict **Sharia law** and reverse the merger of Pakistan's tribal areas with **Khyber Pakhtunkhwa**.
   - The Afghan Taliban deny sheltering them but share **tribal, ethnic, and ideological ties** with TTP fighters.

2. **The Durand Line Dispute**
   - The **1893 British-drawn border** divides the **Pashtun population** between Afghanistan and Pakistan.
   - Kabul has **never recognised** it officially, leading to **recurring border clashes** and rejection of Pakistan's frontier fencing.

3. **Pashtun Nationalism & Cross-Border Identity**
   - Shared **Pashtun ethnicity** fuels resentment against Islamabad's control.
   - The Taliban oppose barriers restricting movement and family ties across the border, undermining Pakistan's authority in tribal belts.

4. **Refugee and Deportation Policy**
   - Pakistan's 2024–25 plan to **deport millions of Afghan refugees** deepened rifts.
   - Islamabad alleged militants hid among refugees, while Kabul accused Pakistan of **collective punishment** of the poor.

5. **Strategic Backfire**
   - Decades of **Pakistani patronage** to the Taliban for "**strategic depth**" against India have rebounded.
   - The **Afghan Taliban now act autonomously**, protect anti-Pakistan groups, and defy ISI influence.

6. **India's Diplomatic Angle**
   - Islamabad suspects that **India's engagement with the Taliban** through humanitarian aid, infrastructure projects, and diplomatic outreach has emboldened Kabul to **resist Pakistani leverage**.

Historical and Ideological Context

- After the **Soviet–Afghan War (1979–1989)**, Afghanistan descended into chaos as **mujahideen factions** turned on each other.
- From this disorder arose the **Taliban (1994)** Deobandi Pashtun students led by **Mullah Mohammed Omar**, promising to restore order and Islamic law.
- With **Pakistan's ISI, Saudi Arabia, and UAE** backing, the Taliban captured Kabul in **1996** and declared the **Islamic Emirate of Afghanistan**.
- Pakistan viewed them as instruments to secure the western flank and neutralise **Pashtun nationalism**. But after **9/11**, Islamabad joined the U.S. against Al-Qaeda, alienating the Taliban and giving rise to the **TTP**, which later turned its guns on Pakistan.
- By 2025, the **Afghan Taliban–TTP–Al-Qaeda nexus** has revived, posing a grave threat to Pakistan's internal stability and border security.

Note

- **Wahhabi School (Saudi):** Places religion above cultural identity; influences Al-Qaeda and Salafist groups.
- **Deobandi School (South Asia):** Accepts local traditions within Islamic discipline; forms the ideological base of both Afghan and Pakistani Taliban.

Pakistan's attempt to **control Afghanistan through proxies** has collapsed into a **security nightmare**. The **Durand Line remains volatile**, **Pashtun nationalism uncontained**, and the **TTP's resurgence** exposes how Islamabad's own policies have **turned its western frontier into a war zone.**

55. SCO

The Shanghai Cooperation Organisation (SCO) is a Eurasian intergovernmental organization focused on political, economic, and security cooperation.

Why Formed?

Formed in 2001 to combat the "three evils" (terrorism, separatism, extremism), promote mutual trust, and foster regional stability post-Soviet era.

Initial Members

China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan (evolved from 1996 Shanghai Five).

Current Members

10 full members: China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, India, Pakistan, Iran (joined 2023), Belarus (joined 2024); plus 2 observers (Afghanistan, Mongolia) and 14 dialogue partners (total ~26 entities).

Objectives

Promote security against terrorism/extremism, economic integration/trade, connectivity/infrastructure, cultural exchanges, and a multipolar world order.

Institutional Structure

- **Heads of State Council (HSC)**: Supreme decision-making body (annual summits).
- **Heads of Government Council (HGC)**: Focuses on economic cooperation.
- **Regional Anti-Terrorist Structure (RATS)**: Tashkent-based for counter-terrorism/intelligence sharing.
- **Secretariat** (Beijing): Administrative hub; Executive Committee (Tashkent) for RATS; Interbank Consortium for finance (largely inactive).
- Principle of the "Shanghai Spirit": The SCO emphasises the principle of the "Shanghai Spirit", which is based on mutual trust, mutual benefit, equality, respect for cultural diversity, and the pursuit of common development.
- Official Language: The official working language of the SCO Secretariat is Russian and Chinese.

Criticisms

1. **Anti-West Stance**: Seen as NATO counter by Carnegie Endowment, with Russia/China pushing multipolar rhetoric against U.S., diluting neutral peace efforts as Central Asia resists (e.g., Kazakhstan on Ukraine).
2. **Russia/China Individual Goals**: Russia seeks Ukraine legitimacy via SCO; China advances BRI bypassing consensus and India opposes BRI over PoK
3. **No Business Deals/Interbank Failures**: Zero major ventures since 2001; Interbank Consortium (2005) stalled on financing/trade due to rival blocs (EAEU vs. BRI), notes ORF analysis.
4. **Bilateral Disputes**: India-Pakistan Kashmir rivalry, India-China Ladakh clashes, Afghanistan-Pakistan border issues block mediation SCO avoids them, dubbed "Contradiction Organisation" by IDSA.
5. **Lost Regional Focus via Expansion**: 26 entities dilute Eurasia core; new members like Iran/Belarus add agendas (e.g., anti-Israel), hindering consensus per Eurasia Review.

6. **India's Connectivity Barriers**: Pakistan blocks India's Central Asia access; BRI sovereignty concerns isolate New Delhi economically, as per ORF.
7. **Weak Institutions/RATS Inefficacy**: RATS fails on Taliban/ISIS threats due to intelligence silos and state complicity (e.g., Pakistan on terrorism), critiques ORF.

Way Forward

India should amplify **its "SECURE" mantra (Security, Economic development, Connectivity, Unity, Respect for sovereignty, Environmental protection) proposed in 2018 and reiterated at 2023/2025 Tianjin summits** to refocus SCO on tangible outcomes, per ORF. Pursue Qingdao Declaration's multilateralism by pushing RATS reforms, Interbank activation (e.g., $1.4bn loans from 2025 summit), and neutral dialogue on disputes. As Carnegie suggests, limit expansion to rebuild cohesion; leverage India's presidency (2023 lessons) for BRI alternatives like Chabahar, fostering inclusive economic ties without dominance.

56. India-UK Trade Deal

The **India–UK CETA**, signed on **July 24, 2025**, aims to **boost bilateral trade from $50 billion to $120 billion by 2030**. Covering **goods, services, investment, and technology**, it marks a major **post-Brexit partnership**, complemented by a separate investment treaty and cooperation on defense and sustainability. The deal awaits ratification and was a key highlight during **UK PM Keir Starmer's visit to Mumbai** with **PM Modi in October 2025**.

Key Features

- **Tariff Cuts:** UK removes duties on 90% of exports; India gains 99% duty-free access for sectors like textiles, pharma, and agriculture.
- **Double Contributions Convention (DCC):** Prevents double social security payments for Indian professionals in the UK for up to three years.
- **Investment & Regulatory Cooperation:** Aims to deepen FDI (UK = 6th largest investor), align standards in **AI, green finance, and digital innovation**.
- **Strategic Roadmaps:** Vision 2035 (defense), TSI (AI, quantum, semiconductors), and EFTA TEPA linkages.

Benefits

- **India:** Higher exports and jobs, $100 billion+ FDI inflows, access to advanced technologies, easier mobility for professionals, and stronger Indo-Pacific partnerships.
- **UK:** Greater market access for whisky, autos, and finance; investment opportunities in India's green and digital sectors; collaboration in sustainability and education.

Limitations

Persistent **visa barriers**, possible **trade-surplus reversal**, **CBAM costs** on steel exports, **slow tariff phaseouts**, and **standards or enforcement gaps** may hinder full gains.

Outcomes of Starmer's 2025 Visit

Included UK universities' entry into India, joint AI and innovation centers, **Critical Minerals Partnership (Phase II)**, **$468 million defense deal**, and reaffirmed cooperation in **AI, telecom, renewables, and UNSC support**.

57. United Nations at 80: A Moment of Reflection

United Nations at 80: A Moment of Reflection (2025)

Theme: ***"Better Together: 80 Years and More for Peace, Development and Human Rights."***

Overview

- **Founded: 24 Oct 1945, after World War II, on the idea of collective security — nations acting jointly to prevent war.**
- **Origins:**
  - ✓ ***League of Nations*** **(1920) → failed due to weak enforcement.**
  - ✓ ***Atlantic Charter*** **(1941) → laid post-war cooperation principles.**
  - ✓ ***Declaration by UN*** **(1942–45) → basis for UN Charter.**
- **Members: 193 + 2 observers (Holy See, Palestine).**
- **HQ: New York Official Languages: Arabic, Chinese, English, French, Russian, Spanish.**

Principal Organs (6)

Organ	Main Role
General Assembly (UNGA)	**Deliberative body — 193 members, 1 vote each; sets norms & budgets.**
Security Council (UNSC)	**15 members (5 P5 with veto + 10 non-permanent); maintains peace.**
ECOSOC	**Coordinates economic & social work via agencies (WHO, UNESCO etc.).**
ICJ	**Judicial organ at The Hague; settles state disputes.**
Trusteeship Council	**Oversaw decolonisation; inactive since 1994.**
Secretariat	**Administrative arm headed by UN Secretary-General (António Guterres).**

Why the UN Appears Weak

- Veto paralysis – P5 divisions stall action (Ukraine, Gaza).
- Declining US support – funding cuts and institutional withdrawals.
- Geopolitical rivalries – US–China–Russia competition bypasses UN.
- Weak enforcement – GA resolutions non-binding.
- Financial stress – arrears from major powers limit operations.
- Rise of nationalism & public skepticism toward globalism.
- Outdated structure – reflects 1945 realities, not today's multipolar world.

UN Strengths

- Universal platform: Equal voice for all states.
- Norm building: UDHR, SDGs, Paris Agreement.
- Peacekeeping: 70+ missions since 1948.
- Humanitarian aid: Health, refugees, disasters (e.g., COVID-19 response).
- Voice for small nations: Enhances global dialogue and inclusivity.

Core Principle – Collective Security

"One for all, and all for one."

UN members act jointly against aggression to preserve peace and sovereignty.

Article 2(4): Prohibition of Use of Force

- All UN member states must refrain from the threat or use of force against the territorial integrity or political independence of any state, or in any manner inconsistent with the UN's purposes (e.g., maintaining peace).
- **Core Principle**: Upholds **sovereign equality** and prohibits aggression, reinforcing collective security (a key UNGA principle from prior queries). It bans wars, invasions, or coercive actions unless authorized by the UNSC or justified under specific exceptions.

- **Exceptions**:
  - Use of force with **UNSC authorization** (e.g., peacekeeping or sanctions under Chapter VII).
  - **Self-defense** under Article 51.

The United Nations General Assembly (UNGA)

United Nations General Assembly (UNGA)

"Parliament of the World" — the main deliberative, policymaking, and representative organ of the UN.

Established: 1945 | **Members:** 193 | **HQ:** New York

Purpose & Role

- Provides a **global forum** for multilateral dialogue on **peace, security, development, and human rights**.
- Resolutions are **recommendatory**, not legally binding — but carry strong **moral and political weight**.

Membership

- **193 UN member states** – each has **one vote**.
- **Observers (non-members):**
  - ✓ *States:* Holy See, Palestine.
  - ✓ *Organizations:* EU, AU, INTERPOL, Arab League, CARICOM, etc.
  - ✓ May speak but not vote.

Structure

- **President:** Elected annually (rotates among 5 regional groups).
- **Vice Presidents:** 21.
- **Main Committees (6):**

1. Disarmament & International Security
2. Economic & Financial
3. Social, Humanitarian & Cultural
4. Special Political & Decolonization
5. Administrative & Budgetary
6. Legal

Sessions

- **Regular:** Annual (Sept–Dec).
- **Special/Emergency:** As needed (e.g., "Uniting for Peace" when UNSC is blocked).
- Meets at **UN Headquarters, New York**.

Functions & Powers (Articles 10–17, UN Charter)

1. **Elections/Appointments:**
   - ✓ Elects 10 non-permanent UNSC members & ECOSOC members.
   - ✓ Appoints Secretary-General (on UNSC recommendation).
   - ✓ Elects ICJ judges.
2. **Budgetary Powers:** Approves UN budget & regulations.
3. **Standard-Setting:** Develops international law, promotes human rights.
4. **International Cooperation:** Discusses and recommends on political, economic, social, and health issues.
5. **Collective Measures:** Can recommend action when **UNSC veto** blocks decisions.

Voting

- **Two-Thirds Majority:** Peace & security, new members, budget, elections.
- **Simple Majority:** Routine matters.
- **Consensus:** Increasingly preferred to ensure broad agreement.

Criticisms

- **One-State-One-Vote:** Disproportionate influence for small states.
- **Non-binding resolutions:** Limited enforcement power.
- **Bloc politics:** Decisions often reflect alliances, not consensus.
- **Bureaucratic delays:** Consensus method slows response in crises.

In Essence: The UNGA remains the world's most inclusive platform for global dialogue and norm-setting a **symbol of equality**, yet limited by its **advisory nature** and **political divisions** in today's multipolar world.

(UPSC 2022)

With Reference to the "United Nations Credentials Committee", consider the following statements:

1. It is a committee set up by the UN Security Council and works under its supervision.
2. It traditionally meets in March, June and September every year.
3. It assesses the credentials of all UN members before submitting a report to the General Assembly for approval.

Which of the statements given above is/are correct?

[A] 3 only
[B] 1 and 3
[C] 2 and 3
[D] 1 and 2

Answer: A Credentials Committee is appointed at the beginning of each regular session of the General Assembly. It consists of nine members, who are appointed by the General Assembly on the proposal of the President
3 only [works under UNGA].

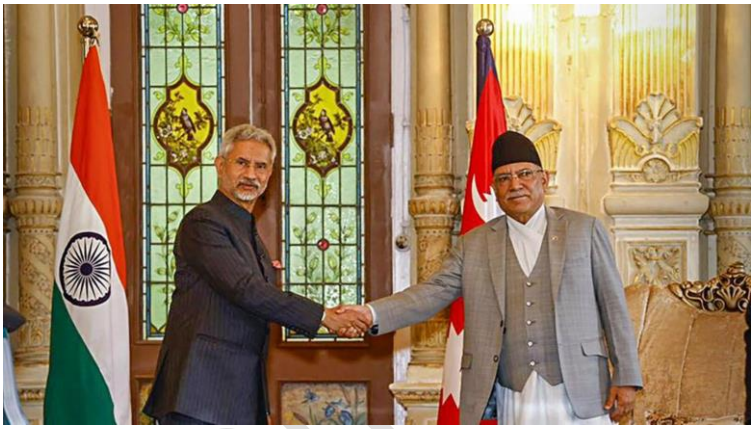
58. Amid Donald Trump ire, IMO defers shipping carbon tax vote to 2027

The IMO (International Maritime Organization) is a UN agency that sets global rules for shipping safety and environmental protection.

- It aims to reduce greenhouse gas emissions from shipping to combat climate change.
- The 2023 IMO GHG Strategy targets:
- 40% reduction in carbon intensity by 2030.
- Net-zero emissions from shipping by 2050.
- The plan includes new fuel standards and a carbon pricing mechanism starting 2027.
- In October 2025, IMO member countries voted to delay the plan by one year after strong opposition, mainly from the US.
- The US called the plan a "global carbon tax" and opposed increased costs for American consumers.

59. Boosting India-Nepal Economic Ties

On October 1, 2025, RBI Governor Sanjay Malhotra announced three measures to promote the Indian Rupee (INR) in global trade, particularly benefiting neighbors like Nepal. These steps aim to reduce dollar dependence, stabilize exchanges, and ease cross-border financing, strengthening India-Nepal ties (pegged at 1 INR = 1.6 NPR since 1994).



The 3 Steps

1. **INR Lending to Non-Residents**: Authorised Dealer (AD) banks can lend INR to individuals/banks in Nepal, Bhutan, and Sri Lanka for bilateral trade, easing working capital for Nepalese businesses.
2. **Expanded Special Rupee Vostro Accounts (SRVA)**: Foreign banks' INR accounts with Indian banks can now invest in corporate bonds and commercial papers (beyond government securities), enabling Nepal to diversify investments.
3. **Transparent Reference Rates**: RBI will publish official exchange rates for major trading partners' currencies (e.g., NPR, UAE Dirham), facilitating predictable INR-based invoicing and settlements.

Why It Matters for India–Nepal Economic Ties

- Peg stability: 1 INR = 1.6 NPR (fixed rate) already gives monetary stability to Nepal's rupee.
- RBI's steps reduce dependence on the US dollar, making bilateral trade more rupee-denominated.
- Indian rupee financing will ease institutional credit bottlenecks faced by Nepali businesses.
- Encourages joint ventures, value addition industries, and stronger trade integration.

Key Hurdles in Nepal's Economy

- Post-COVID slowdown: Temporary recovery due to remittances; industry remains weak.
- Credit crunch: Nepalese banks hesitate to lend, especially to small firms; high lending concentration among big industrial houses.
- Supply chain issues: Weak domestic demand and lack of working capital disrupted value chains.
- Unemployment and political instability: Economic stress has political implications.

Economic Prospects and Multiplier Effects

- Easier rupee-based financing may revive stalled industries in Nepal.
- Encourages INR trade settlements, reducing foreign exchange risks and current account pressure.
- May strengthen FDI flows — Indian investments already form 33% of Nepal's total FDI stock (~$670 million).
- Facilitates broader financial cooperation (sovereign guarantees, Letters of Credit, risk rating frameworks).
- Overall, could create a level playing field and boost regional economic resilience

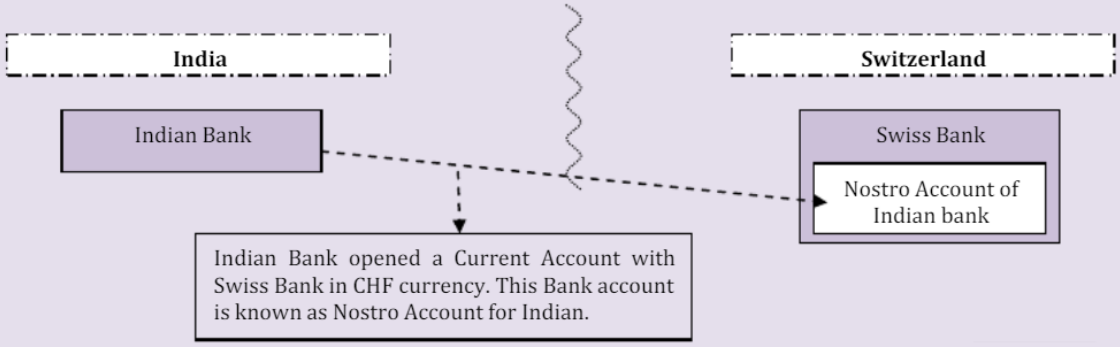
Nostro and Vostro accounts

Nostro and Vostro accounts are banking terms used to manage cross-border transactions between banks and facilitate international trade.

- A Nostro account (from the Latin for "ours") is an account that a domestic bank holds in a foreign bank, denominated in the foreign bank's currency. From the domestic bank's perspective, it is "our account held by your bank." For example, if an Indian bank holds a dollar account with a US bank, that is a Nostro account for the Indian bank. This account allows the domestic bank to manage foreign currency transactions without having a physical presence in that country.
- A Vostro account (from the Latin for "yours") is the same account but viewed from the foreign bank's side. It is "your account held with us"—the foreign bank holds this account on behalf of the domestic bank, in the foreign bank's currency. Using the earlier example, from the US bank's perspective, the dollar account held for the Indian bank is a Vostro account.

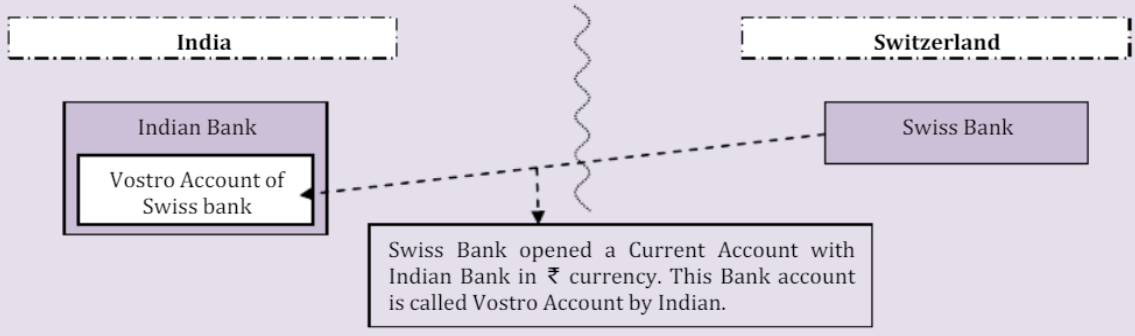
Nostro A/C: [Ours Account with You]

Nostro Account is a Current account maintained by a domestic bank/dealer with a foreign bank in foreign currency. For example, Current Account of SBI Bank (an Indian bank) with Swiss Bank in Swiss Franc (CHF) currency is a Nostro A/C.



Vostro A/C: [Yours Account with us]

Vostro A/C is a Current account maintained by a foreign bank with domestic bank in Rupee currency.
For example: Account of Swiss bank in India with SBI in Rupee (₹) Currency.



60. Mapping of Venezuela

Major Physiographic Regions

Region	Location	Key Features	Significance
1. Guiana Highlands (Guayana Shield)	SE Venezuela (south of Orinoco River)	Ancient plateau (2 billion yrs old); *tepuis* (table mountains) like **Mount Roraima** (2,810 m); dense rainforest.	Mineral wealth (iron, gold, diamonds); biodiversity hotspot.
2. Llanos (Orinoco Plains)	Central Venezuela, east of Andes	Flat grasslands (<200 m); flood-prone during rains; drained by Orinoco tributaries.	Cattle ranching, rice & corn cultivation; rich wildlife (capybara, caiman).
3. Lake Maracaibo	NW Venezuela, Zulia State	World's largest lake (~13,500 km²); brackish estuary linked to Caribbean via 55 km channel.	Major oil-producing basin; hub for fishing, transport, & urban growth (Maracaibo city).
4. Andean Highlands (Cordillera de Mérida & Perijá)	Western border with Colombia	Extension of Andes; **Pico Bolívar (5,007 m)** highest peak; temperate valleys.	Coffee agriculture, tourism (Mérida); seismically active zone.
5. Maracaibo Basin	Around Lake Maracaibo	Sedimentary lowland with wetlands & rivers (Catatumbo).	Holds world's largest oil reserves (~300 billion barrels); environmental degradation & land subsidence.
6. Coastal Ranges (Cordillera de la Costa)	Northern Venezuela, along Caribbean coast	Twin mountain belts (Coastal & Interior); rugged hills, beaches, coral reefs.	Contains **Caracas** & **Valencia**; agriculture (cacao, sugarcane); prone to earthquakes.

Rivers of Venezuela

- **Orinoco River:**
  - ✓ Third-longest in South America (~2,140 km).
  - ✓ Flows in a vast arc from Guiana Highlands → Atlantic Ocean (Orinoco Delta).
- **Caroni River:**
  - ✓ Major tributary; originates in Guiana Highlands; **Guri Dam** generates hydro-power.
- **Catatumbo River:**
  - ✓ Drains into Lake Maracaibo; site of **Catatumbo Lightning**, highest lightning frequency on Earth.

Notable Physical Feature

Angel Falls (Salto Ángel)

- **Location:** Canaima National Park, Bolívar State (Guiana Highlands).
- **Height:** 979 m free fall; total ~1,000 m — world's highest waterfall.
- **Origin:** From Auyán-tepui ("Devil's Mountain").
- **Significance:** UNESCO World Heritage Site; major tourist attraction symbolizing Venezuela's natural beauty.

In Essence

Venezuela's landscape transitions from **snow-capped Andes → fertile Llanos → ancient Guiana plateau**, unified by the mighty **Orinoco River** system. Its geography underpins both its **resource wealth (oil, minerals)** and **ecological diversity**, making it one of South America's most varied physical regions.

Additional information

Waterfall	Location (Country)	River	Key Feature / Note
Niagara Falls	USA–Canada Border (North America)	**Niagara River**	One of the world's largest; between Lake Erie and Lake Ontario.
Victoria Falls	Zambia–Zimbabwe Border (Africa)	**Zambezi River**	One of the widest waterfalls; UNESCO World Heritage Site.
Nohkalikai Falls	Meghalaya, India	**Rani/Nohk-alikai stream**	Tallest plunge waterfall in India (~340 m), near Cherrapunji.
Jog Falls (Gerusoppa / Gersoppa / Joga)	Karnataka, India	**Sharavathi River**	Highest segmented waterfall in India; major hydel source.

61.NCRB "Crime in India 2023" report:

The National Crime Records Bureau (NCRB) released the Crime in India 2023 report on September 30, 2025, analyzing over 6 million crimes. It shows a 7.2% overall rise, with shifts from violent to cyber and economic offenses. This is the last report under the Indian Penal Code (IPC); from 2024, the Bharatiya Nyaya Sanhita (BNS) applies.

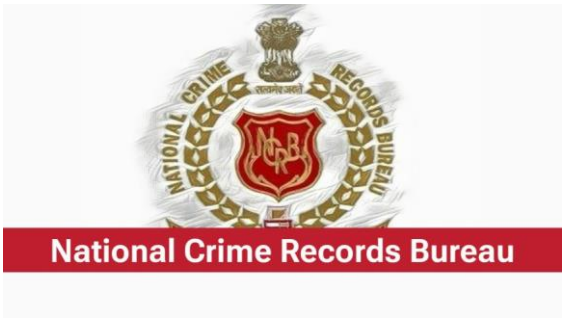
- Total crimes rose 7.2% to 6.24 million cases.
- Violent crimes declined: Murder down 2.8%, rape down 5.9%.
- Cybercrime jumped 31.2% to 86,420 cases (69% fraud); steady rise from 27,000 in 2018 to 86,000+ in 2023; Karnataka, Telangana, and UP lead in cyber offences.
- Crimes against vulnerable groups increased: Women up 0.7%, SCs up 0.4%, STs surged by 28.8% (mainly ethnic violence), children up 9.2%.
- Economic offences totaled 2.04 lakh, with forgery and fraud making up 88%.
- Trend shows a shift from traditional violent to digital and economic crimes.

National Crime Records Bureau (NCRB)

The **National Crime Records Bureau (NCRB)** is India's central agency for collecting and analyzing crime data, established in 1986 under the Ministry of Home Affairs (MHA). Its 2023 report, highlighting a 28.8% rise in crimes against Scheduled Tribes, underscores its role in tracking crime trends for policy and policing.

About NCRB

- **Established**: Formed in 1986, based on Tandon Committee and National Police Commission (1977–81) recommendations. Headquartered in New Delhi under MHA.
- **Purpose**: Acts as India's crime data hub, storing and analyzing records from all states/UTs. Supports police investigations and policy-making with national statistics.



Functions of NCRB

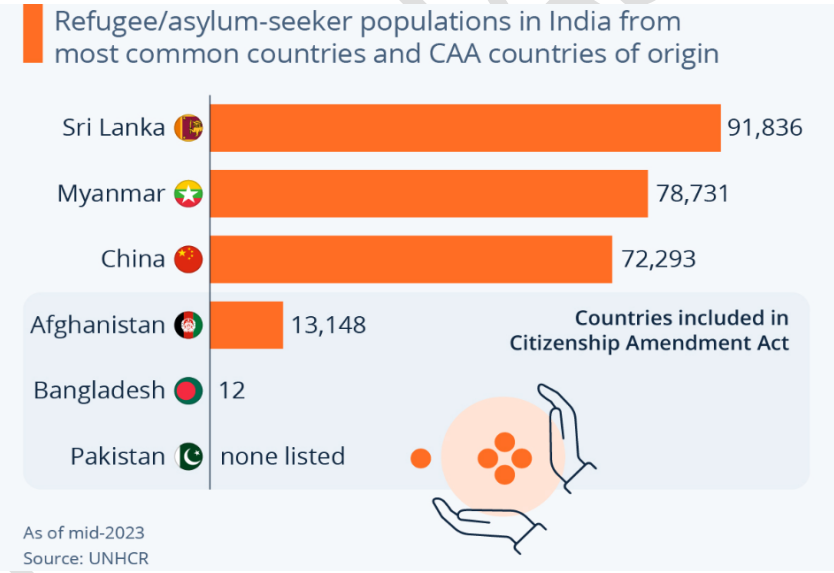
- **Data Collection & Analysis**: Gathers crime data from states; maintains databases for tracking patterns. Analyzed 6.24 million cases in 2023, up 7.2%.
- **CCTNS Management**: Runs Crime and Criminal Tracking Network; digitizes police records. Enables online complaints and nationwide criminal checks via National Digital Police Portal.
- **National Database of Sexual Offenders**: Tracks repeat sexual offenders with a shared database. Helps states identify perpetrators (e.g., 60,000 POCSO cases in 2023).
- **Cybercrime Monitoring**: Manages Online Cyber-Crime Reporting Portal for reporting digital crimes. Recorded 86,420 cybercrime cases in 2023, up 31.2%.
- **Capacity Building**: Provides CyTrain portal for cybercrime training to police and judiciary. Trained 50,000 personnel in 2023 for digital forensics.
- **Forensic Support**: Runs Central Finger Print Bureau for biometric identification. Maintains national fingerprint database for criminal tracking.
- **Report Publication**: Releases annual reports like Crime in India, Accidental Deaths & Suicides, and Prison Statistics. 2023 report noted 2.04 lakh economic offenses.

62. Refugees in India

Key Issue

- Union Home Minister Amit Shah emphasized distinguishing between refugees (fleeing persecution) and infiltrators (illegal entrants), but applying fair criteria is challenging.
- India lacks a clear, unified refugee law, leading to inconsistent treatment and potential harassment of genuine refugees.

A refugee is a person who has been forced to flee their country due to persecution, war, or violence based on race, religion, nationality, political opinion, or membership in a social group. They are officially recognized under international law (e.g., 1951 UN Refugee Convention) and granted legal protection, including the right to stay in a host country without being returned home (non-refoulement principle).



Who are Asylum Seekers?

- An asylum seeker is someone who has fled their country and applied for refugee status but is awaiting a legal decision on their claim.
- They may not yet have protection and could face uncertainty, but they are presumed to need safety until their application is processed.

Legal Framework

- India is not a signatory to the 1951 UN Refugee Convention or 1967 Protocol, so no single law defines refugees.
- Until March 2025, laws like the Foreigners Act (1946), Registration of Foreigners Act (1939), and Passport Act (1920) governed foreign nationals, including refugees.
- From April 2025, the **Immigration and Foreigners Act** replaced these, also absorbing the Immigration (Carriers' Liability) Act (2000), streamlining but not fully clarifying refugee policy.
- Undocumented refugees are treated as illegal migrants under the Citizenship Act (1955) and may face penalties or be labeled infiltrators.

Refugee Situation in India

- As of June 2023, India hosts over 2.11 lakh refugees/persons of concern (from Myanmar, Afghanistan, Bangladesh, Africa, West Asia).
- Examples: ~63,000 Tibetan refugees have a 2014 rehabilitation policy; ~90,000 Sri Lankan Tamils lack similar support, showing inconsistent treatment.

Citizenship (Amendment) Act, 2019 (CAA)

- Grants citizenship to six non-Muslim minorities (Hindu, Sikh, Buddhist, Jain, Parsi, Christian) from Bangladesh, Pakistan, and Afghanistan who entered before December 31, 2014.
- Criticized for excluding Muslims, Sri Lankan Tamils, and Rohingya, raising concerns about religion-based discrimination.

Recent Developments

- A 2025 notification exempts registered Tamil refugees (pre-January 9, 2015) from penalties under the Immigration and Foreigners Act, extending to other groups too.
- Despite this, religion-based exclusions persist, lacking a fair and consistent approach.

Challenges and Concerns

- No comprehensive refugee policy leads to arbitrary decisions and varying standards for different refugee groups.
- Genuine refugees risk harassment as "infiltrators" without clear legal protections.
- Need for consistent, fair, and humanitarian policies to treat all refugees equally, regardless of origin or religion.

NOBLE PRIZES

63. Nobel Prize in Medicine 2025

Announcement Details

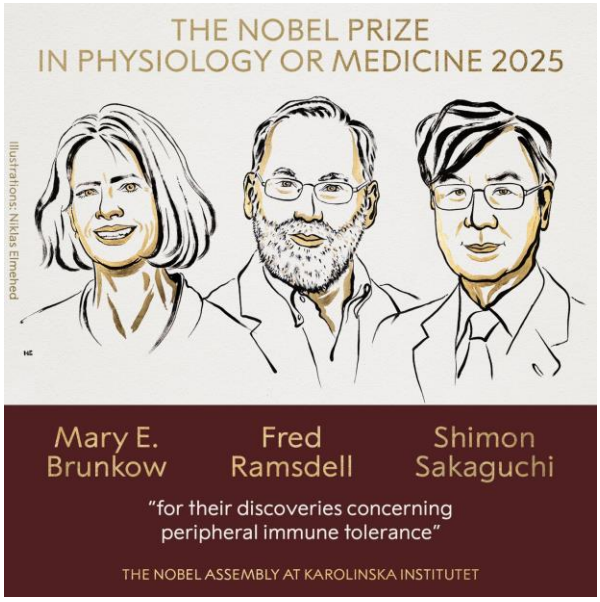
- **Date:** October 6, 2025
- **Awarded by:** Nobel Assembly at Karolinska Institutet, Stockholm
- **Category:** Physiology or Medicine
- **Prize Amount:** 11 million Swedish kronor (~USD 1.17 million), shared equally

The Laureates

Name	Nationality	Contribution
Mary E. Brunkow (b. 1961)	American	Discovered link between FOXP3 gene and immune tolerance
Fred Ramsdell (b. 1960)	American	Demonstrated FOXP3's control over regulatory T cells
Shimon Sakaguchi (b. 1951)	Japanese	Discovered regulatory cells (Tregs) and their role in immune erance

Core Concept – Peripheral Immune Tolerance

The ability of the immune system to **prevent attacks on the body's own healthy cells** (self-tissues) outside the thymus, ensuring immune responses are only directed against pathogens.



What the Winners Discovered

1. **Sakaguchi's Discovery (1990s):**
   - Identified **Regulatory T Cells (Tregs)** in mice.
   - These cells act as immune *"security guards"* suppressing overactive immune responses and preventing autoimmune reactions.

2. **Brunkow & Ramsdell's Contribution (Late 1990s–2000s):**
   - Linked **mutations in the FOXP3 gene** to autoimmune diseases such as **IPEX** in humans and **"Scurfy"** in mice.
   - Proved that FOXP3 is the **master regulator** of Treg development and function.

3. **Combined Impact:**
   - Established that immune tolerance operates **not only within the thymus (central tolerance)** but also **beyond it (peripheral tolerance)** reshaping immunology and disease therapy.

Types of T Cells

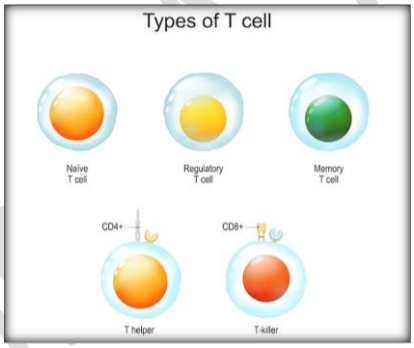
Basics of the Immune System

- **Helper T Cells (CD4+):** Detect invaders and release cytokines to mobilize other immune cells.

- **Killer T Cells (CD8+):** Destroy infected or abnormal cells using proteins like perforin and granzymes.
- **Regulatory T Cells (Tregs):** Discovered by Sakaguchi; suppress overactive immune reactions and prevent self-damage.

Role of the Thymus (Central Tolerance)

- Located behind the sternum; active mainly in childhood.
- Trains T cells to **recognize self from non-self**.
- Self-reactive T cells are destroyed — this is **central tolerance**.
- However, some "escaped" T cells can still attack the body — hence the need for **peripheral tolerance**, the focus of the Nobel-winning research.



The Nobel Discovery: Beyond the Thymus

- **Peripheral Tolerance Mechanism:**
  - **Sakaguchi:** Showed that regulatory T cells in peripheral tissues (blood, organs) suppress harmful immune responses even after thymic selection.
  - **Brunkow & Ramsdell:** Identified **FOXP3** as the genetic switch that enables Tregs to function.
  - Defects in FOXP3 lead to uncontrolled immune activation and severe autoimmune disorders.

Why It Matters – Medical Impact

Domain	Application
Autoimmune Diseases	Enhancing Tregs helps manage **type 1 diabetes, multiple sclerosis, rheumatoid arthritis**.
Cancer Immunotherapy	Blocking Tregs near tumors helps the immune system attack cancer cells more effectively.
Transplant Medicine	Boosting Tregs reduces organ rejection risk.
Allergy & Vaccine Research	Helps design better immune-modulating therapies and allergy treatments.

Therapeutic Applications

- **Boosting Tregs:** Drugs that stimulate FOXP3 and expand Tregs to suppress autoimmune flares.
- **Blocking Tregs:** In cancer, inhibiting Tregs around tumors frees killer T cells to destroy cancer.
- **Cell Therapy Trials:** Infusion of lab-grown Tregs to treat gut inflammation, organ grafts, and lupus.

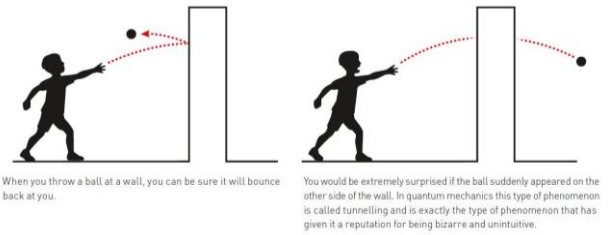
64. Nobel Prize in Physics 2025

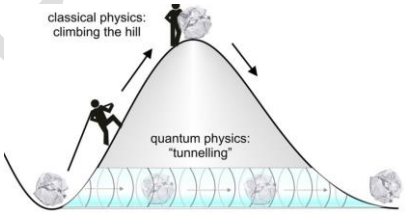
Award

The **2025 Nobel Prize in Physics** was awarded to **John Clarke (UC Berkeley)**, **Michel H. Devoret (Yale/UC Santa Barbara)**, and **John M. Martinis (UC Santa Barbara)** for demonstrating that **quantum effects like tunneling and energy quantization** occur in large-scale electrical circuits, not just in microscopic systems. Their 1980s experiments bridged **quantum and classical physics**, laying the foundation for modern **quantum technologies** such as superconducting qubits.

What Did They Do?

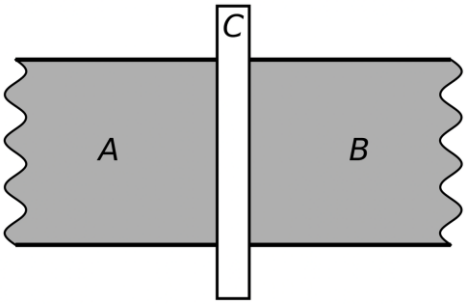
- **Experiment Setup:** Built and tested a **superconducting circuit** with two superconductors separated by a thin insulating layer a **Josephson junction** cooled to near absolute zero (1984–1985, UC Berkeley).
- **Macroscopic Quantum Tunneling:** Observed current tunneling through the energy barrier without sufficient classical energy direct evidence of **quantum tunneling** on a macroscopic scale.
- **Energy Quantization:** Found discrete energy levels ("quantum steps") in the circuit, proving it behaved like a **single large quantum particle**.
- **Noise Isolation:** Carefully eliminated environmental disturbances to confirm the observed effects were genuinely quantum.





Applications

- **Quantum Computing:** Forms the **basis of superconducting qubits**, essential for next-gen computers capable of solving complex problems (e.g., drug design, optimization).
- **Sensors and Detectors:** Enables **ultrasensitive magnetometers** (for brain scans, dark matter, geology) and **single-photon detectors** (for astronomy, imaging).
- **Precision Measurement:** Advanced **quantum voltage standards** and **magnetic field sensing**, contributing to precision metrology and low-power electronics.
- **Broader Impact:** Drives hybrid quantum systems (linking photons, spins) and informs strategies to overcome **quantum decoherence**.



What is Superconductivity?

- A **quantum state** in which materials conduct electricity **without resistance** when cooled below a **critical temperature** (around −273°C).
- Discovered in **1911**; involves **Cooper pairs**—paired electrons moving collectively and expelling magnetic fields (the **Meissner effect**).

What is a Josephson Junction?

- A **quantum device** of two superconductors separated by a **nanometer-thin insulating barrier**, allowing a **supercurrent** to flow without voltage through **quantum tunneling**.
- Predicted by **Brian Josephson (1962)**, who received the **1973 Nobel Prize**.
- Used by Clarke, Devoret, and Martinis to **demonstrate macroscopic quantum tunneling**, showing quantum behavior in a large-scale system.

65. Nobel Prize in Chemistry 2025

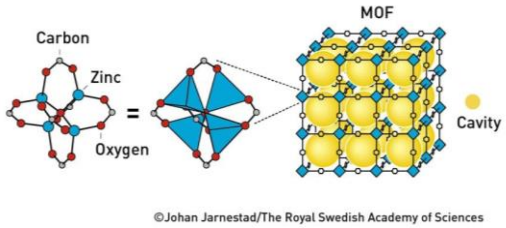
Coordination compounds consist of a central metal atom or ion bonded to surrounding molecules or ions called ligands via coordinate bonds, where the ligand donates an electron pair to the metal. Examples include vitamin B12 (cobalt ion bound to nitrogen ligands) and hemoglobin (iron ion in a heme group with porphyrin ligands).

Metal-Organic Frameworks (MOFs): Explanation

MOFs are a type of coordination compound where metal ions (e.g., copper, zinc) are linked by organic ligands to form repeating crystalline structures in 3D (length, breadth, height), creating porous networks like a molecular sponge. Different scientists, such as Robson (copper with nitrile ligands), Kitagawa (cobalt/nickel with bipyridine), and Yaghi (zinc-based MOF-5), experimented with various metals and ligands to create diverse structures with tunable pore sizes and numbers.

- Awarded on October 8, 2025, for metal-organic frameworks (MOFs).
- MOFs redefined material design for sustainability challenges.
- Honored curiosity-driven work with vast industrial impact.

What Are MOFs?



- MOFs provide ultra-high surface area and tunable porosity, enabling gas storage, separation, and catalysis.
- Porous crystals of metal ions and organic linkers.
- Vast internal surface area, like a football field.
- Tunable cavities trap gases or water molecules.
- Designed via reticular chemistry, not random trials.
- Over 100,000 MOF variants for diverse uses.

Applications of MOFs

- Trap CO_2 to reduce greenhouse gas emissions.
- Remove pollutants like PFAS from water sources.
- Harvest drinking water from desert air.
- Store hydrogen/methane for clean fuel vehicles.
- Catalyze reactions for batteries, semiconductors.
- Separate gases like oxygen for renewable energy.
- Deliver drugs precisely in medical treatments.

Simplified Development Timeline of MOFs

Period	Scientist(s)	Discovery/Contribution
Mid-1970s	Richard Robson	Conceptualized framework by combining metal ions with organic molecules forming porous crystals.
1990s-2003	Kitagawa & Yaghi	Developed flexible and functional MOFs; demonstrated applications in gas absorption, water vapor control.
2000s-Present	OMAR Yaghi	Designed MOFs with tailored properties; applications in environmental, pharmaceutical, and energy sectors.

Why MOFs Are Revolutionary: Applications and Global Importance

- MOFs provide ultra-high surface area and tunable porosity, enabling gas storage, separation, and catalysis.
- Applications include capturing toxic chemicals, reducing environmental pollutants, drug delivery, carbon capture, water harvesting from air.
- MOFs' modularity allows creating materials with specific properties for clean energy and sustainable technologies.
- They offer advantages over traditional porous materials by being flexible, stable, and customizable.

Analogy for Easy Understanding

- MOFs are like a "molecular sponge" or "scaffold" – a structure with many tiny cavities that can trap and release molecules like gases or water vapor.
- Similar to how a sponge soaks up water but can be squeezed to release it, MOFs can absorb gases and release them under controlled conditions.

Difference Between MOFs and Zeolites

Feature	Zeolites	MOFs
Composition	Fully inorganic (aluminosilicate minerals)	Hybrid organic-inorganic frameworks
Flexibility	Rigid and hard	Flexible and tunable; can change shape
Porosity	Microporous with fixed pore sizes	Highly porous with adjustable pore sizes
Applications	Catalysis, ion-exchange, detergents	Gas storage, separation, drug delivery, sensors
Stability	Chemically and thermally stable	Stable but may have enhanced functional properties
Synthesis Complexity	Natural materials, well-known synthesis	Designed and synthesized for specific functions

66. Nobel Peace Prize 2025:

The 2025 Nobel Peace Prize was awarded on October 10, 2025, to Venezuelan opposition leader María Corina Machado for her work in uniting the opposition and pushing for a peaceful shift from dictatorship to democracy in Venezuela. The Norwegian Nobel Committee praised her courage in facing threats while staying in the country and resisting military control. This year's prize highlights "defenders of freedom" amid global authoritarianism, with 338 candidates considered (244 individuals, 94 organizations).

Who is María Corina Machado?

- A Venezuelan politician and activist known for opposing the Maduro regime.
- She has unified opposition groups and supported democratic rights despite living in hiding due to life threats.
- Her efforts focus on a just, peaceful transition without wavering on freedom.

Key Details About the Prize

- Awarded annually by the Norwegian Nobel Committee for contributions to peace, following Alfred Nobel's 1895 will.
- Focuses on an author's lifetime work, emphasizing peace deals, disarmament, and international cooperation.
- Prize: 11 million Swedish kronor (~$1.05 million USD), given on December 10.
- Last year: Japanese group Nihon Hidankyo (atomic bomb survivors).
- Nominations: Due by January 31; committee decides by consensus or majority vote.

67. NOBEL PRIZE IN LITERATURE 2025

Who is László Krasznahorkai?

- Nationality: Hungarian.
- Born: 1954 in Gyula, a town near the Hungary–Romania border.
- Age: 71 years as of 2025.
- Profession: Novelist, essayist, and screenwriter.
- Known For: Long, philosophical novels with complex sentences that explore existential and social themes.

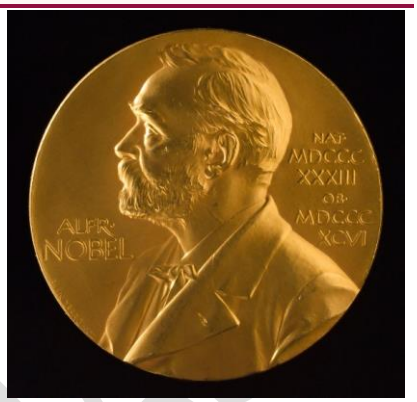
About the Nobel Prize in Literature (for context)

- Awarded annually by the Swedish Academy in Sweden.
- Recognizes an author's outstanding contributions to literature.
- Focuses on lifetime work rather than a single book.
- Carries high global prestige in literary, cultural, and diplomatic fields.

Why He Won the Nobel Committee's Citation

- Citation: "For his compelling and visionary oeuvre that, in the midst of apocalyptic terror, reaffirms the power of art."
- His works depict chaotic, collapsing societies without illusions.
- They highlight art's role as a redemptive force amid darkness.
- His artistic gaze shows modern society's fragility but maintains faith in creativity.

68. What are Nobel Prizes?



The Nobel Prizes are international awards established by the will of Alfred Nobel (d. 1896) to recognise outstanding contributions that "confer the greatest benefit to humankind." They are awarded annually in the following fields:

- **Physics**
- **Chemistry**
- **Physiology or Medicine** (often shortened to "Medicine")
- **Literature**
- **Peace** (officially the Nobel Peace Prize)
- **The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel** (commonly called the Nobel Prize in Economics — instituted in 1968 by Sweden's central bank)

Who selects each prize

- **Royal Swedish Academy of Sciences:** Physics, Chemistry, Economics.
- **Nobel Assembly at Karolinska Institute:** Physiology or Medicine.
- **Swedish Academy:** Literature.
- **Norwegian Nobel Committee (appointed by the Norwegian Parliament):** Peace Prize.

When the prizes are announced and awarded

- **Announcement (winners revealed):** Annually in **October** — announcements for the different prizes are released on separate days in early–mid October (the exact dates vary year to year).
- **Award ceremony (medals & diplomas): 10 December** each year (the anniversary of Alfred Nobel's death).
  - All prizes **except the Peace Prize** are awarded in **Stockholm, Sweden** (usually at the Stockholm Concert Hall and presented by the King of Sweden).
  - The **Nobel Peace Prize** is awarded in **Oslo, Norway** (presentation typically at Oslo City Hall).

Can the Nobel Prize be awarded posthumously?

- **Generally no.** The Nobel statutes state that the prize **shall not** be awarded posthumously.
- **Exception:** If a person is announced as a laureate and **then dies** before the award ceremony, the prize may still be presented posthumously (i.e., death occurring *after* the announcement does not automatically cancel the award).
- In practice the committees avoid awarding prizes to already-deceased nominees; nominations and deliberations are subject to procedural rules and confidentiality.
- Maximum Nobel Prize is awarded for 3 people

Who (or what) can receive a Nobel Prize?

- **Individuals** and **organizations** (the Peace Prize has often been awarded to organizations).
- Prizes can be shared by multiple individuals (or individuals and organizations) in the same year; the prize amount is then divided according to the committee's decision.

Other Important points:

- **Nominations:** Made by qualified nominators; nominations and committee deliberations are kept confidential for 50 years.

- **Prize money & medals:** The Nobel Foundation determines the monetary award (amount can change). Laureates receive a medal, a diploma, and the monetary award.
- **Economics prize:** Not one of the original prizes in Alfred Nobel's will — it was established later by Sweden's central bank but is administered in the Nobel framework.

India's first Nobel laureate

- **Rabindranath Tagore** — awarded the **Nobel Prize in Literature** in **1913**.
  - Awarded "because of his profoundly sensitive, fresh and beautiful verse" (recognition centred on his collection *Gitanjali*).
  - Tagore (1861–1941) was the first Indian Nobel laureate and one of the first non-Europeans to receive a Nobel Prize in Literature.

List of Nobel Laureates from India / of Indian Origin

Name	Year	Field	Contribution / Work Recognized	Nationality at the Time of Award
Rabindranath Tagore	1913	Literature	For *Gitanjali* — profoundly sensitive, fresh, and beautiful verse.	Indian
C.V. Raman	1930	Physics	Discovery of the Raman Effect — scattering of light by molecules.	Indian
Har Gobind Khorana	1968	Physiology or Medicine	Elucidation of the genetic code and its function in protein synthesis.	U.S. citizen (Indian origin)
Mother Teresa	1979	Peace	Work through *Missionaries of Charity* for the poor and destitute in Kolkata.	Indian citizen (naturalized)
Subrahmanyan Chandrasekhar	1983	Physics	Theoretical studies on the structure and evolution of stars (Chandrasekhar limit).	U.S. citizen (Indian origin)
Amartya Sen	1998	Economic Sciences	Contributions to welfare economics and studies on poverty and social choice.	Indian
Venkatraman Ramakrishnan	2009	Chemistry	Studies of the structure and function of the ribosome.	U.S.–U.K. citizen (Indian origin)
Kailash Satyarthi	2014	Peace	Struggle against child labour and advocacy for children's rights (shared with Malala Yousafzai).	Indian