CURRENT AFFAIRS WEEKLY

WEEK 2
JULY, 2025

MAINS ARTICLE

GS II

- COLLEGIUM SYSTEM IN INDIA
- CUSTODIAL DEATH
- RESERVATIONS IN NON-JUDICIAL STAFF RECRUITMENT
- LANGUAGE: A DEBATE IN INDIA
- INDIA–BOLIVIA BILATERAL MEETING IN BRAZIL
- PM MODI'S DIPLOMATIC TOUR

GS-III

- USA TARIFF ON COPPER AND PHARMACEUTICALS
- GREAT NICOBAR INFRASTRUCTURE PROJECT
- WASTE TO ENERGY
- INDIA'S DEEPTECH VISION
- INTERNAL SECURITY (GS-III)
- INFLUX OF CHIN REFUGEES INTO MIZORAM
- GAMBHIRA-MUJPUR BRIDGE COLLAPSE
- CLOUDBURSTS IN HIMACHAL PRADESH
- SEVERE WATERLOGGING IN DELHI

PRELIMS ARTICLE

HISTORY

- Keeladi Excavation:
- Dr. Syama Prasad Mookerjee

POLITY & GOVERNANCE

- Karnataka Inter-State and Irrigation Water Projects
- Agitation Over Reservation Policy in Nagaland
- Bihar Domicile Quota Reform
- India Strengthens Diaspora
- PARAKH Dissemination Portal
- Employment-Linked Incentive (ELI)
- First-Ever Digital Census in 2027

INTERNATIONAL RELATIONS

- PM Modi Conferred Brazil's Highest Civilian Honour
- India–Namibia Strengthen Strategic Cooperation
- Brazil BRICS Summit
- India–Trinidad and Tobago
- IAEA Withdraws Final Inspectors from Iran

ECONOMY

- Anti-Dumping Duties
- India's Strategic Engagement in Critical Minerals Clubs
- World Bank Gini Index 2023

ECOLOGY & ENVIRONMENT

- Forest Rights Act,2006
- Rare Coastal Sighting of Great Hornbill

SCIENCE & TECHNOLOGY

- Palm Oil and Health
- Nipah Virus Resurfaces in Kerala
- Matrilineal Clans in Neolithic China
- Fifth generation aircraft
- CRISPR-Edited Rice
- 700 MWe PHWRs at Kakrapar

DISASTER MANAGEMENT

- Catastrophe Bonds

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DISCLAIMER

The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

CONTENT

2nd WEEK - JULY, 2025

SECTION - A

SECTION - B

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I am grateful to GS SCORE for providing guidance to me and many more aspirants. I practiced a lot with GS SCORE.

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I am truly grateful to GS SCORE for their guidance. They offered genuine mentorship.

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SECTION -A

MAINS ISSUES

COLLEGIUM SYSTEM IN INDIA

CONTEXT

CJI B.R. Gavai reaffirmed the judiciary's commitment to a transparent, merit-based, and socially inclusive collegium system for judicial appointments. His remarks, made at a Bombay Bar Association event, come amid heightened concerns over external interference and demands for greater accountability in the process.

Collegium System

Definition and Constitutional Basis

- The **Collegium System** is a mechanism for appointing judges to the Supreme Court and High Courts.
- It is based on **judicial interpretation** of the Constitution; **not mentioned explicitlyA** in the Constitution.
- Primarily derives its legitimacy from **Articles 124(2)** and **217(1)**.

Evolution Through Judicial Pronouncements

- **First Judges Case (1981)**: Gave primacy to the **executive** in judicial appointments.
- **Second Judges Case (1993)**: Shifted primacy to the **judiciary**; established the collegium system.
- **Third Judges Case (1998)**: Clarified the composition and procedure; **CJI + 4 senior-most SC judges**.

Composition of Collegium

- **Supreme Court Collegium**: CJI + 4 senior-most Supreme Court judges.
- **High Court Collegium**: Chief Justice of the HC + 2 senior-most HC judges.

Functions of Collegium

- Recommends appointments and transfers of judges in High Courts and the Supreme Court.
- Plays a crucial role in maintaining **judicial independence**.
- Sends recommendations to the Law Ministry → then to the President for appointment.

Procedure for Appointment

- **Chief Justice of India** is usually the senior-most SC judge.
- For SC judges: Proposal initiated by CJI with collegium concurrence.
- For HC judges: Proposed by HC Collegium → vetted by SC Collegium.
- Final appointment made by **President of India**.

Criticism of the System

- **Lack of transparency** in decision-making.
- **No formal mechanism** for recording reasons or ensuring accountability.
- **Exclusion of the executive and legislature**, raising concerns over checks and balances.

Efforts for Reform

- **National Judicial Appointments Commission (NJAC) Act, 2014** was passed to replace collegium with a broader body.
- **Struck down in 2015** by the Supreme Court as violating the **basic structure** (judicial independence).

Recent Developments

- CJI B.R. Gavai emphasized **transparency**, **merit**, and **inclusive representation** in appointments.

- Steps taken to publish collegium decisions online to ensure **public accountability**.

Way Forward

- Institutionalize **clear criteria** for selection.
- Ensure **diversity** in appointments (gender, caste, region).
- Introduce **external oversight** mechanisms without compromising judicial independence.

CUSTODIAL DEATH

CONTEXT

The Aurangabad Bench of the Bombay High Court directed Parbhani police to register an FIR within a week in the alleged custodial death of Dalit law student Somnath Suryawanshi, citing prima facie evidence of custodial torture and fundamental rights violations. The decision follows a petition filed by the victim's mother after autopsy and judicial findings revealed signs of physical assault during illegal detention.

Definition and Context

- Custodial death refers to the death of an individual while in police or judicial custody.
- It includes deaths due to torture, negligence, denial of medical care, or abuse during interrogation or detention.

Constitutional Provisions Violated

- **Article 21**: Protection of life and personal liberty.
- **Article 20(3)**: Protection against self-incrimination.
- **Article 22**: Protection against arbitrary arrest and detention.

Legal Provisions & Judicial Guidelines

- **DK Basu vs. State of West Bengal (1997)**: Issued 11 binding guidelines on arrest and detention and introduced mandatory arrest protocols, maintenance of arrest registers, and medical checks.
- **Nilabati Behera vs. State of Orissa (1993)**: Ensured **compensatory jurisprudence** for custodial violence victims.
- **Prakash Singh vs. Union of India (2006)**: Mandated police reforms including separation of law and order and investigation wings.

Recent Data and Trends

As per NCRB 2021:

- 88 custodial deaths reported.
- Only 21 cases led to FIRs.
- NHRC data (2017–2022): Over 2,000 custodial deaths across India.

Causes of Custodial Deaths

- Use of third-degree methods during interrogation.
- Lack of surveillance (absence of CCTV coverage).
- Delay or denial of medical assistance.
- Political interference in policing and lack of accountability.
- Weak implementation of court-mandated guidelines.

Institutional Mechanisms

- **NHRC and SHRCs**: Empowered to investigate custodial deaths and recommend compensation.
- **State Police Complaint Authorities (SPCAs)**: Weak presence or limited autonomy in most states.
- **Judicial Magistrate Inquiries**: Often delayed or poorly executed.

International Frameworks

- **UN Convention Against Torture (UNCAT)**: India signed in 1997 but has not ratified.
- **Nelson Mandela Rules (2015)**: UN standards for humane treatment of prisoners.
- **Universal Declaration of Human Rights (1948)**: Right to dignity and protection from torture.

Recommendations and Reforms

- Enact a **comprehensive anti-torture law** in line with UNCAT.
- Ensure **independent investigation** by external agencies in all custodial deaths.
- Strengthen **police accountability mechanisms** as per **Prakash Singh guidelines**.
- Mandatory use of **CCTV in all police stations and lock-ups**.
- Establish **fast-track courts** for trials in custodial violence cases.
- Include **human rights and ethics training** in police curriculum.

RESERVATIONS IN NON-JUDICIAL STAFF RECRUITMENT

CONTEXT

The Supreme Court has amended its recruitment rules to include reservations for OBCs, PwDs, ex-servicemen, and dependents of freedom fighters, aligning its staff appointments with central affirmative action norms.

Reform under Article 146(2) of the Constitution: A Milestone in Institutional Affirmative Action

Constitutional Backing and Legal Authority

Amendment Power under Article 146(2):

- Article 146(2) empowers the **Chief Justice of India (CJI)** to make appointments and frame service conditions for officers and servants of the Supreme Court.
- The amendment was made to **Rule 4A** of the **Supreme Court Officers and Servants (Conditions of Service and Conduct) Rules, 1961**.

Nature and Scope of the Reform

Inclusion of New Reservation Categories:

- The amendment mandates reservations for SCs, STs, OBCs, Persons with Disabilities (PwDs), Ex-servicemen, and Dependents of Freedom Fighters in direct recruitment to non-judicial posts.
- It specifies that such reservation shall be in accordance with Central Government rules, subject to modifications by the CJI.

Introduction of Roster System:

- A **200-point roster system** has been adopted, following the precedent set in **R.K. Sabharwal v. State of Punjab (1995)** to ensure equitable and rotational distribution of reserved posts.

Historical Context and Delay in Implementation

Delayed Adoption of OBC Quota:

- The Supreme Court had upheld 27% reservation for OBCs in Indira Sawhney v. Union of India (1992).
- Despite being the validating authority of OBC reservation in public employment, the apex court itself took over three decades to adopt the same in its own administrative machinery.

Significance of the Reform

Institutional Alignment with Affirmative Action:

- The move ensures the Supreme Court's internal recruitment policies reflect constitutional commitments to social justice.
- Senior Advocate and Rajya Sabha MP P. Wilson termed the reform a "historic step" toward aligning judicial institutions with national equity mandates.

Symbolic Importance:

- The reform comes under the tenure of **Chief Justice B.R. Gavai**, the second Dalit Chief Justice of India—making the move **symbolically resonant and institutionally progressive**.

Way Forward

- **Codification and Transparency**: The Supreme Court should codify reservation policies and recruitment procedures to ensure **transparency and accountability** in implementation.
- **Periodic Review Mechanism**: A standing committee may be constituted to **monitor compliance** and ensure continuous updating based on changes in central government policies.
- **Judicial Inclusivity Beyond Staff**: Broader reforms are needed to enhance representation of marginalised communities in **judicial appointments, law clerkships, and judicial internships**.
- **Capacity Building**: Special training programmes for candidates from reserved categories should be introduced to ensure **equity in performance and career progression**.

Article 146 – Appointments and Conditions of Service of Officers and Servants of the Supreme Court

Article 146:

- **Clause (1):** Appointments of officers and servants of the Supreme Court are made by the **Chief Justice of India (CJI)** or any other officer authorized by him.
- **Clause (2):** The **conditions of service** of such officers and servants are also decided by the **Chief Justice**, subject to rules made by Parliament.
- **Clause (3):** Provisions of Article 311 (related to dismissal, removal, or reduction in rank of public servants) apply to officers and servants of the Supreme Court as well.

LANGUAGE: A DEBATE IN INDIA

CONTEXT

The Maharashtra government has withdrawn its decision to make Hindi the default third language in primary schools amid political uproar and public backlash.

Language Issue in India After Independence

Constitutional and Historical Background

- **Article 343(1):** Declares **Hindi in Devanagari script** as the official language of the Union.
- **Article 343(2):** Allowed **English** to continue as an official language **for 15 years** (till 1965).
- **Munshi-Ayyangar Formula (1949):** A compromise formula that made Hindi the official language but allowed continued use of English temporarily.

Gandhian Approach to Language

- **Mahatma Gandhi** supported **Hindustani** (blend of Hindi and Urdu) as a **common language** to bridge communal and regional divides.
- He emphasized **linguistic harmony** rather than linguistic dominance.

Official Languages Act, 1963 and Amendments

- Passed to **extend the use of English** beyond 1965 due to massive opposition in non-Hindi states.
- **Amendment in 1967** enabled **bilingual communication** between Centre and states (Hindi + English).
- Also provided for use of **regional languages** in administration and exams.

Anti-Hindi Protests

- 1965 Anti-Hindi Agitation in Tamil Nadu marked a major political turning point.
- Violent protests forced the Centre to clarify that English would not be phased out, respecting federal linguistic diversity.
- Jawaharlal Nehru's Assurance: Hindi would never be imposed on unwilling states.

Three-Language Formula (1968 onwards)

- Implemented through **education policies** to balance linguistic unity and diversity.
  - In **Hindi-speaking states**: Hindi, English, + one modern Indian language.
  - In **non-Hindi-speaking states**: Regional language, English, + Hindi.
- Aimed to promote **inter-regional understanding**, yet faced uneven implementation.

Linguistic Reorganisation of States

- **Initial resistance** from Nehru post-Partition due to fears of balkanization.
- **Andhra Pradesh** became the **first linguistic state in 1953** after Potti Sriramulu's death due to hunger strike.
- **States Reorganisation Act, 1956** created linguistic states across India.
- Reinforced the role of language in **identity, administration, and democracy**.

Why Language Became a Sensitive Issue

- **Cultural Identity**: Language represents ethnic and regional identity.
- Access to Education & Jobs: Citizens prefer administration in their mother tongue for clarity and efficiency.
- **Fear of Domination:** Non-Hindi states feared homogenization and loss of linguistic diversity.

The National Language Debate

- India has **no National Language** (as clarified by Ministry of Home Affairs).
- **Hindi** is the **official language**, **English** is an **associate official language**.
- Challenges with Hindi as National Language:
  - **Multiple dialects** (e.g., Bhojpuri, Maithili).
  - **Script and numeral unfamiliarity**.
  - Cultural and historical influence from **Persian, Urdu, English**.

Alternatives proposed:

- **English** for neutrality.
- **Hindustani** or **Sanskrit** for pan-Indian appeal.

Eighth Schedule and Recognition of Regional Languages

- Eighth Schedule contains 22 officially recognized languages (originally 14).
- Grants eligibility for:
  - Public exams (like UPSC).
  - Use in legislatures and courts.
  - Development under Article 351.

Benefits of an Official/National Language (if adopted voluntarily)

- Administrative efficiency across the Union.
- Unified identity in international forums.
- Cost-effective governance through linguistic standardization.
- However, any national language must be voluntarily adopted, not imposed.

International Relations (GS-II)

INDIA–BOLIVIA BILATERAL MEETING IN BRAZIL

Context:

Prime Minister Narendra Modi met the President of Bolivia, Luis Arce Catacora, on the sidelines of the 17th BRICS Summit in Rio de Janeiro, where both leaders reviewed the bilateral relationship, with a focus on critical minerals, digital infrastructure, and development cooperation.

India–Bolivia Bilateral Cooperation:

- Bolivia is a key partner for India in **Latin America**, especially in the **critical minerals sector**, such as **lithium**, vital for India's green energy and battery ecosystem.
- India and Bolivia are expanding cooperation in areas such as:
  - **Trade and commerce**
  - **Digital Public Infrastructure (DPI)** including **UPI**
  - **Health and pharmaceuticals**, including **traditional medicine**
  - **SMEs**, **training**, and **capacity-building**

Critical Minerals Focus:

- Bolivia is part of the **"Lithium Triangle"** (with Chile and Argentina), holding one of the world's largest reserves of **lithium**, essential for EV batteries and energy storage systems.
- India aims to reduce dependence on China for rare earths and critical minerals by building ties with resource-rich nations like Bolivia.

Development Cooperation Instruments:

- India supports Bolivia via:
  - **Quick Impact Projects (QIPs)** for local development.
  - **ITEC (Indian Technical and Economic Cooperation)** program for training and scholarships.

Solidarity and Diplomacy:

- PM Modi expressed solidarity over Bolivia's **March–April 2025 floods**, reinforcing India's **humanitarian diplomacy**.

- PM also **congratulated Bolivia** on the **bicentennial (200 years)** of independence (6 August 2025).
- Bolivia's **joining the International Solar Alliance (ISA)** reflects convergence on climate action and solar energy transition.

Global South Engagement:

- The meeting strengthens India's **engagement with the Global South**, in line with its vision for **inclusive global governance**.

PM MODI'S DIPLOMATIC TOUR

CONTEXT

Prime Minister Narendra Modi undertook a 9-day, 5-nation diplomatic tour from 1st to 9th July 2025, covering Ghana, Trinidad & Tobago, Argentina, Brazil, and Namibia.

The Global South

- The term **Global South** refers to countries in **Africa, Latin America, Asia, and Oceania** with shared post-colonial experiences and aspirations for development and equity in global governance.
- These nations are increasingly assertive in shaping international priorities around **climate justice**, **digital equity**, and **economic independence**.
- India positions itself as a **natural leader and voice of the Global South**, promoting **South-South cooperation**, **capacity building**, and **reformed multilateralism**.

Strategic Objectives of the visit:

- **Reinforce Development Partnerships** through sustainable infrastructure, technology transfer, and capacity building.
- **Strengthen India's Leadership** role in multilateral platforms such as **BRICS, G20, and the UN**.
- **Enhance Mineral and Energy Security** by securing strategic minerals and expanding clean energy cooperation.
- **Promote Digital Diplomacy** via Indian public digital infrastructure models (e.g., UPI, CoWIN, DigiLocker).
- **Deepen Diaspora Engagement** to boost people-to-people ties and India's soft power.

Country-Wise Visit:

Ghana

- First visit by an Indian Prime Minister in over **30 years**.
- **Focus Areas:**
  - **Strategic minerals**: Bauxite and manganese for clean energy.
  - **Health and energy partnerships**.
  - **Diaspora engagement** with 15,000+ Indian-origin residents.
- Emphasized **democratic solidarity** and long-term development cooperation.

Trinidad & Tobago

- Commemorated 180 years of Indian heritage.
- First bilateral visit since 1999.
- **Key Initiatives:**
  - Collaboration on **digital health platforms**, telemedicine, and e-governance.
  - Focus on **climate resilience** and **disaster preparedness**.
  - Celebration of diaspora culture strengthens India's **soft power diplomacy**.

Argentina

- First bilateral visit by an Indian PM in **57 years**.
- **Strategic Focus:**
  - **Lithium mining** in the Lithium Triangle (Argentina–Bolivia–Chile).
  - **Agriculture**, **space cooperation**, and **AI governance**.
  - Critical for India's **EV battery supply chain and energy transition**.
  - Strengthening trade and technological cooperation despite ideological differences.

Brazil

- Attended the **17th BRICS Summit** in Rio de Janeiro.
- Key Themes:
  - Multilateral reform, AI ethics, climate finance, and inclusive global governance.
  - Bilateral discussions in Brasilia focused on:
  - Defence cooperation
  - Biofuels and sustainable agriculture
  - Space technology
- Reaffirmed the India-Brazil Strategic Partnership.

Namibia

- Third visit by an Indian Prime Minister; first by PM Modi.
- **Key Focus Areas:**
  - **Renewable energy**: Solar and green hydrogen.
  - **Wildlife diplomacy**: Extension of cheetah translocation program.
  - **Digital governance** and **vocational training support**.
- Symbolized **anti-colonial solidarity** and future-focused development.

Key Strategic Themes Emerging from the visit:

Minerals and Energy Diplomacy

- Securing critical minerals like **lithium, bauxite, manganese** vital for India's energy and EV ambitions.

- Emphasis on **sustainable mining**, **value addition at source**, and **technology sharing**.

Digital Public Infrastructure Cooperation

- Export of India's successful digital platforms like **UPI**, **DigiLocker**, and **CoWIN**.
- Focus on bridging the **digital divide** in the Global South.
- India redefined as a **knowledge-sharing development partner**, not merely a donor.

Climate Resilience and Environmental Diplomacy

- Bilateral cooperation on green hydrogen (Namibia), biofuels (Brazil), and climate-smart agriculture (Argentina).
- Promotes community-led, context-sensitive climate solutions aligned with India's sustainability goals.

South-South Cooperation and Multilateral Reform

- India's leadership in **BRICS+ and G20** strengthens Global South's presence in global institutions.
- Advocates for **UN, WTO, IMF reform** and equitable global governance frameworks.
- Acts as a **bridge-builder** between developing and developed worlds.

USA TARIFF ON COPPER AND PHARMACEUTICALS

CONTEXT

President Trump announced a 50% tariff on copper imports and threatened up to 200% tariffs on pharmaceutical imports during a cabinet meeting on July 8, 2025. This aims to bolster domestic production but raises concern over trade tensions and price inflation

India–US Relations

Evolution of India–US Relations

Cold War Era Divergence

- India pursued a policy of **Non-Alignment**, while the United States aligned more closely with **Pakistan** as a strategic partner in South Asia.
- Bilateral ties remained limited due to ideological differences and geopolitical rivalry during the bipolar world order.

Post-Cold War Engagement

- With the end of the Cold War and India's economic liberalization in 1991, diplomatic engagement between the two countries expanded significantly.
- The **2005 Civil Nuclear Agreement** marked a transformational moment, enabling India to access civil nuclear technology and formalizing strategic cooperation.

Strategic and Defence Agreements Signed

- **LEMOA (2016):** Enabled reciprocal logistics support between armed forces.
- **COMCASA (2018):** Facilitated encrypted communication and equipment interoperability.
- **BECA (2020):** Enabled real-time geospatial intelligence and navigation data sharing.
- **GSOMIA (2002):** Allowed the secure exchange of classified military information.

Significance of Bilateral Relations

Economic Engagement

- The United States was India's **second-largest trading partner in 2023**.
- Bilateral trade witnessed a **72% increase** between 2017–18 and 2022–23.
- Sectors involved: pharmaceuticals, defence, IT services, energy, and agriculture.

Defence Cooperation

- India was designated as a **"Major Defense Partner"** in 2016.
- Joint military exercises include **Yudh Abhyas, Malabar**, and **Tiger Triumph** (first tri-service).
- US companies have collaborated in co-developing critical defence platforms with Indian manufacturers.

Technological and Innovation Collaboration

- Launch of **India–US Initiative on Critical and Emerging Technology (iCET)** in 2023.
- **Focus areas:** AI, quantum computing, semiconductors, 5G, space, and cybersecurity.
- Establishment of **INDUS-X** to link defence startups, academia, and investors across both nations.

Cultural and Educational Ties

- Over **200,000 Indian students** are studying in the US.
- The Indian-American diaspora exceeds **4 million**, strengthening people-to-people connections.
- Academic collaborations between major institutions enhance mutual understanding.

Climate and Clean Energy Cooperation

- India and the US are partners in the **Clean Energy Agenda 2030**.
- Joint commitments under **Mission Innovation** and cooperation on **green hydrogen, solar, and biofuels**.

Multilateral and Strategic Cooperation

- Both countries are members of **QUAD**, advocating a **free, open, and rules-based Indo-Pacific**.
- Cooperation includes vaccine diplomacy, maritime domain awareness, infrastructure development, and cybersecurity.

Recent Developments and Forthcoming Initiatives

- **Security of Supply Arrangement (SOSA):** Aims to ensure stable and predictable defence equipment supply from the US to India.
- **Reciprocal Defence Procurement (RDP) Agreement:** To improve market access for Indian defence manufacturers and streamline acquisition procedures.
- **Joint Production Initiatives:** Includes collaboration on **Stryker Armoured Vehicles** and **GE-F414 fighter jet engines**.
- **Public–Private Innovation Partnerships:** Establishment of joint innovation funds and incubators under **DARPA** and **Defense Innovation Unit (DIU)**.
- **Streamlining Export Controls and Licensing:** India's **STA-1 status** aids faster access to controlled defence technologies. Bilateral dialogue is ongoing to ease **ITAR** and **EAR** regulations.

Challenges in India–US Relations

- **Trade Imbalances and Tariff Disputes:** Contentions over agricultural subsidies and tariffs on steel/aluminium persist.
- **Data Privacy and Localization:** The US prefers **free data flow**, while India advocates **data localization** under its Data Protection Law.
- **Defence Procurement Delays:** Complex regulatory procedures and pricing concerns slow execution of deals, e.g., **MQ-9B drone acquisition**.
- **Visa and Immigration Policies:** Restrictions on **H-1B visas** affect Indian IT professionals and cross-border talent mobility.
- **Geopolitical Divergences:** Differences over policies on **Russia, Iran, and Afghanistan** sometimes lead to strategic divergence.

Way Forward

- **Resolving Trade Barriers:** Negotiating reduced tariffs and increasing market access for both sides.
- **Enhancing Technology and Cyber Cooperation:** Creating a **Cybersecurity Forum** and harmonizing data protection standards.
- **Streamlining Defence Procurement:** Strengthening frameworks like the **Defense Technology and Trade Initiative (DTTI)**.
- **Relaxation in Visa Policies:** Enhancing access to H-1B visas for Indian tech professionals.
- **Strengthening Multilateral Engagements:** Expanding cooperation in **Indo-Pacific security, counter-terrorism**, and **global rule-making** in AI and space.

PYQ:

Q: Discuss the evolution of India-US defence cooperation in recent decades. What are the challenges that need to be addressed to deepen this strategic partnership? (2020)

GREAT NICOBAR INFRASTRUCTURE PROJECT

CONTEXT

The ₹72,000-crore Great Nicobar Infrastructure Project (GNIP) has come under scrutiny after experts pointed out that the Environmental Impact Assessment (EIA) downplays the region's tsunami and earthquake risks, despite scientific studies indicating high seismic vulnerability in the area.

Great Nicobar Island Infrastructure Project (GNIP)

Geographical & Ecological Context

- **Great Nicobar Island (GNI)**
  - **Largest and southernmost** island of the Nicobar group, part of the **Andaman & Nicobar Islands UT**.
  - Home to **Galathea Bay**, **Campbell Bay**, and **Indira Point** (southernmost point of India).
    - Declared part of **Great Nicobar Biosphere Reserve** and **UNESCO Man and Biosphere Programme (MAB)**.
    - Biodiversity Hotspot: Tropical evergreen forests, endemic flora and fauna (e.g., Nicobar crab-eating macaque, leatherback turtles).
  - Galathea Bay Wildlife Sanctuary (denotified in 2021)
    - Notified in **1997** to conserve nesting sites of **leatherback turtles**.
    - Falls under **Coastal Regulation Zone (CRZ) 1A** – highest ecological sensitivity.
    - Denotification contradicts the **Marine Turtle Action Plan, 2021**.

Project Overview & Strategic Relevance

Key Components of the Project:

- **International Container Transshipment Terminal (ICTT)** at Galathea Bay.
- **Greenfield International Airport**
- **Gas and Solar-Based Power Plant (450 MVA)**
- **Greenfield Township and Tourism Projects**
- **Cruise Terminal, Ship Repair & EXIM Ports (recent additions)**

Strategic Importance:

- Located close to **Malacca, Sunda, and Lombok Straits** — global maritime chokepoints.

- Enables India's **maritime surveillance** against increasing Chinese activity in the Indo-Pacific.
- Aligns with:
  - **Act East Policy**
  - **QUAD's Indo-Pacific Vision**
  - **Maritime India Vision 2030**
  - **Amrit Kaal Vision 2047**

Major Concerns

Environmental Concerns:

- **Deforestation**: Over **130 sq. km of pristine forest** to be cleared.
- **Tree felling**: Actual numbers could **exceed 10 million**; initial estimates were under-reported.
- **Loss of coral reefs** and **marine biodiversity** due to port construction in **CRZ 1A** zone.
- **Compensatory afforestation** in **Haryana and Madhya Pradesh** — ecologically non-equivalent.

Legal & Institutional Concerns:

- **Violation of SC Guidelines** from **Shekhar Singh Commission (2002)**:
- Ban on tree felling in tribal reserves.
  - Afforestation **before** clearance — not followed.
  - **Violation of FRA, 2006**: No **Free, Prior, Informed Consent (FPIC)** of **Shompen and Nicobarese tribes**.
  - **Lack of transparency**: Environmental clearance details withheld under national security pretext.
- **Procedural Gaps:**
  - EIA conducted by **private agency (Vimta Labs)**; questioned for downplaying tsunami risk.
  - IIT-Kanpur study (2019) flagged **high seismic risk**; this was **not cited** in EIA.
  - **No site-specific seismic studies** done, despite proximity to **Andaman-Sumatra Subduction Zone** (2004 tsunami epicenter nearby).

Tribal Rights and Socio-Cultural Sensitivity

- **Shompen Tribe:**
  - One of India's **Particularly Vulnerable Tribal Groups (PVTGs)**.
  - Live in isolation; depend entirely on forests.
  - Project threatens **livelihood, culture, and existence**.
- **Forest Rights Act, 2006 (FRA):**
  - Mandates Gram Sabha consent for any diversion of forest land.
  - Disregarded in project execution.

Way Forward: Policy Recommendations

Domain	Recommendation
Ecology	Conduct independent biodiversity assessments; consider alternate sites; enforce CRZ norms strictly.
Forests	Focus on restoration and afforestation within Nicobar, not in ecologically non-comparable mainland states.
Tribal Welfare	Ensure FPIC under FRA, 2006; form community-led oversight councils.
Seismic Preparedness	Commission site-specific geotechnical studies; include disaster-resilient design for all infrastructure.
Transparency	Publish EIA findings and clearance status; include civil society in monitoring.

WASTE TO ENERGY

CONTEXT

Delhi is getting its fifth waste-to-energy (WTE) plant, located in Bawana, with a capacity to process 3,000 tonnes of waste daily.

Waste Segregation at Source and Waste-to-Energy in India

Solid Waste Management in India

- **Definition**: Solid Waste includes garbage, refuse, sludge, and other discarded materials from residential, industrial, and institutional sources.
- **Key Statute**: Governed by the **Solid Waste Management (SWM) Rules, 2016**, notified under the **Environment (Protection) Act, 1986**.
- **Solid Waste Generation**:
  - **India**: 1,70,338 tonnes/day (CPCB 2021–22)
  - **Waste Treated**: ~91,512 tonnes/day (~54%)
  - **Delhi**: Generates ~11,000 MT/day; processes ~8,073 MT/day
  - **Improvement**: Waste processing increased from **18% in FY 2014–15** to **78% in FY 2024**

Waste Segregation at Source

SWM Rules, 2016 Categories:

- **Biodegradable**: Organic, compostable (food scraps, paper)
- **Non-Biodegradable**: Recyclables and inert materials (plastics, glass, metals)

- **Domestic Hazardous**: Diapers, cleaning agents, napkins, e-waste, batteries

Significance:

- Prevents **cross-contamination** of recyclable/organic waste
- Facilitates **resource recovery** through composting and recycling
- **Reduces burden** on landfills and improves urban sanitation
- Helps in tracking hazardous waste and **reduces public health risk**

Waste-to-Energy (WtE) Technologies

Provisions under SWM Rules, 2016:

- **Waste ≥1500 kcal/kg** calorific value must be diverted to energy recovery.
- **Mandatory RDF Use**: Industries within 100 km of RDF plants to use 5% RDF as fuel.

Major WtE Technologies:

Method	Description
Incineration	Combustion of MSW to generate heat → steam → electricity
Gasification	Converts organic waste to syngas using high temperatures and low oxygen
Anaerobic Digestion	Biological degradation in oxygen-free setup to produce biogas
Pyrolysis	High-temp decomposition in absence of oxygen → bio-oil, syngas, char
Fermentation	Microbial action on biomass → ethanol
Landfill Gas Recovery	Methane from decomposing landfills is collected for combustion energy

Benefits:

- **Reduces landfill demand** and GHG emissions (methane diversion)
- **Converts liability to asset** (energy + materials)
- **Resource recovery** from metals and recyclables post-incineration
- **Supports circular economy and clean energy goals**

Draft SWM Rules, 2024 – Key Highlights

- **Legal Backing**: Proposed under **Environment (Protection) Act, 1986**
- **Enforcement**:
  - *Sanitation Workers* authorized to impose fines for improper segregation
  - Clear accountability for citizens and local bodies

Segregation Streamlined:

- Mandatory sorting into **Wet**, **Dry**, **Sanitary**, and **Special Care Waste**

Agricultural Waste Management:

- Bans **open burning**; mandates **collection and storage** of stubble/agri-waste
- **Gram Panchayats** empowered to penalize for stubble burning

Policy Linkages and Governance

- **National Clean Air Programme (NCAP)**: WtE and stubble management linked with urban air quality goals.
- **Swachh Bharat Mission 2.0**: Focus on 100% segregation and waste processing.
- **National Bio-Energy Programme**: Promotes bio-CNG and waste-to-biogas units.

Challenges in Implementation

- **Low household compliance** with segregation norms
- **Inadequate infrastructure** for RDF plants and WtE projects
- **Financial non-viability** and poor operation of WtE plants in smaller towns
- **Informal waste sector** lacks training and safety in handling hazardous/domestic waste
- **Public apathy** and insufficient behavioral awareness

Way Forward

- **Strengthen ULB capacities** to implement SWM rules effectively
- **Promote decentralized composting** and biomethanation at ward-level
- **Incentivize citizen participation** through reward-based models
- **Private Sector Participation (PPP)** for sustainable WtE plants
- **Strict enforcement** of segregation, landfill diversion targets, and agri-waste management
- Promote **Extended Producer Responsibility (EPR)** to reduce packaging and plastic waste

INDIA'S DEEPTECH VISION

CONTEXT

The Union Minister for Commerce and Industry recently highlighted the need to shift India's startup landscape from surface-level business model innovation to Deep Technology (DeepTech), emphasising fundamental scientific research and engineering-driven entrepreneurship.

DeepTech

- DeepTech refers to innovations that are **founded on significant scientific or engineering advances**. Unlike business-model innovations, DeepTech aims to solve real-world, complex problems using **fundamental research and original product design**.

Core Fields:

- Artificial Intelligence (AI) hardware and software
- Robotics and automation
- Internet of Things (IoT)
- Material sciences and quantum mechanics
- Power electronics and semiconductor design
- Molecular drug discovery and medical technologies

Key Issues for a DeepTech Ecosystem

Product Mindset Deficit

- India has not yet produced a **globally acclaimed industrial or consumer product**.
- Reliance remains on foreign tech platforms (e.g., TensorFlow, Android).
- China's ascent in DeepTech began with reverse engineering followed by strategic R&D investment.

R&D Culture

- DeepTech demands a **long-term, failure-tolerant approach** to innovation.
- Requires **founders with technical depth**; e.g., Google (Larry Page), Tesla (Elon Musk), NVIDIA (Jensen Huang).
- Indian startups need to prioritise **in-house technological creation** over outsourcing.

Educational Reforms Needed

- Current curricula focus on **tool-based learning** rather than **first-principle engineering and science**.
- Need to integrate **multi-disciplinary learning** (e.g., AI + Material Science + Healthcare).
- Adopt models from MIT/Stanford that emphasise theory + application.

Supportive Infrastructure

- DeepTech needs **access to prototyping labs, precision testing centres, and certification facilities**.
- MSMEs and startups cannot afford such infrastructure individually.

Policy and Funding Framework

- Agencies like NRDC must **expand support beyond incubators**.
- Evaluation should be based on **technical merit, roadmap, and R&D depth**, not location.
- Promote **academia–industry collaboration**, **seed capital for hardware startups**, and **test beds**.

Way Forward: DeepTech as Strategic National Asset

Policy Measures:

- Launch a **National DeepTech Mission** under NITI Aayog
- Increase **public R&D spending** (currently ~0.7% of GDP; target 2%)
- Fast-track access to **global patent networks and IP protection**
- Incentivise **faculty-led startups** and **student research translation**
- Facilitate **cross-border collaboration** with institutions like DARPA, Horizon Europe

Institutional Steps:

- Establish **DeepTech Centres of Excellence** in IITs/NITs
- Reform AICTE/UGC guidelines to include **research credits** and **industry internship mandates**
- Encourage PSU and private sector co-investment in DeepTech R&D consortia

INFLUX OF CHIN REFUGEES INTO MIZORAM

CONTEXT

Fresh clashes between Chin ethnic armed groups—CNDF and CDF-H—in Myanmar's Chin State have led to the displacement of around 4,000 Chin refugees, who crossed into Mizoram's Champhai district through the Zokhawthar–Tiau River border.

India–Myanmar Border and FMR

- **Historical and Ethnic Context of the Border Issue**
  - The **India–Myanmar border** stretches **1,643 km**, passing through four Indian states: **Arunachal Pradesh, Nagaland, Manipur, and Mizoram**.
  - **Ethnic fragmentation** began with:
    - Myanmar's separation from British India in **1935**.
    - India's independence in **1947**.
- This disrupted the **traditional boundaries of ethnic communities** like the **Nagas**, **Kukis**, and **Chins**—leading to identity, security, and sovereignty challenges.
- The **Naga Self-Administered Zone (NSAZ)** in Myanmar and **Eastern Nagaland** in India are inhabited by **closely-knit ethnic groups** who now find themselves split by an **artificial boundary**.

Free Movement Regime (FMR)

- **FMR allows border residents** to travel up to **16 km** across the Indo–Myanmar border **without a visa**.
- It was formalized to:
  - **Preserve traditional ties**, kinship, and economic interdependence.
  - Enable **students**, **traders**, and families to move freely.
  - Reduce alienation caused by the hardening of borders.

Shortcomings of the Free Movement Regime

- **Smuggling**: Contraband and narcotics are moved under the guise of head-loads, which bypass inspection under FMR.
- **Insurgent Movement**:
  - Militant groups such as **NSCN-K**, **ULFA**, and **NDFB** exploit the **porous border** to establish **safe havens in Myanmar**.
  - These groups conduct strikes in India and retreat into Myanmar.

External Interference:

- **China** has been suspected of offering **logistical and intelligence support** to these insurgent groups.

Geographic Constraints:

- The border is **heavily forested**, **mountainous**, and **difficult to patrol**, complicating surveillance and response.

Border Fencing and its Impacts

- The **construction of fences** to strengthen border security has raised **strong opposition** from local communities.
- Affected ethnic groups: **Konyaks**, **Khiamniungans**, and **Yimchungers**.
- **Concerns**:
  - Loss of access to **ancestral lands**, **cultivated fields**, and **forest produce**.
  - **Disruption of cultural and familial links** across borders.
  - Risk of **fueling anti-establishment sentiments** and **destabilizing peace** in the region.

Policy Recommendations: Border Management Strategy

Confidence-Building Measures (CBMs)

- Conduct **tripartite talks** involving:
  - Government of India (GoI)
  - Myanmar authorities
  - Local ethnic stakeholders (via state government)

Inclusive Development Initiatives

- Launch **cross-border socio-economic programmes**:
  - Improve **livelihood options** to reduce dependence on illegal trade.
  - Focus on **connectivity, education, health, and micro-enterprises**.

Balanced Security Approach

Implement:

- **Selective fencing** in critical hotspots (not blanket fencing).
- Use of **technology (drones, thermal imaging, satellite surveillance)**.
- **Regulated movement** through monitored crossing points.

Policy Assurance

- Assure locals that **fencing decisions will not be unilateral**.
- **Consultation with affected communities** must precede any construction or enforcement measure.

Way Forward

- India must **balance its national security interests** with **ethnic sensitivities and humanitarian considerations**.
  - A **multi-pronged approach** involving:
  - **Smart border management**
  - **Ethno-cultural respect**
  - **Bilateral cooperation with Myanmar**
  - **Integrated development of the border region**
- Strengthening **people-to-people ties**, rather than erecting hard barriers, may enhance long-term peace and security.

Tyao (Tiau/Tio) River

Geographical and Hydrological Features

- **Length:** Approximately **159 km (99 miles)** long.
- **Origin:** Arises near **Khuangphah village** in **Champhai district**, **Mizoram**, India.
- **Course:** Forms part of the **international boundary** between **India and Myanmar**.
- **Mouth/Confluence:** Ultimately joins the **Kaladan River** (also known as the **Chhimtuipui River**), which is an important transboundary river flowing into Myanmar.

Geopolitical Significance

- The river acts as a **natural border demarcation** between:
  - **Zokhawthar** in Mizoram (India)
  - **Rikhawdar** in Chin State (Myanmar)
- There is an **official border crossing and trade point** over the river, connecting Zokhawthar and Rikhawdar via a **bridge**.
- The river region is part of India's **Act East Policy zone**, enhancing its **strategic and economic relevance**.

(See Figure No. 01 on next page)

PYQ:

Q: "The north-eastern region of India has been facing insurgency for decades. Examine the role of external state and non-state actors in creating this insurgency. Suggest suitable measures to be undertaken to contain this." (2016)

FIGURE NO. 01

GAMBHIRA-MUJPUR BRIDGE COLLAPSE

CONTEXT

A section of the Gambhira-Mujpur bridge in Gujarat's Vadodara district collapsed on July 10, 2025, killing 11 people and injuring several, raising concerns over structural safety and administrative negligence.

Man-Made Disasters:

- **Man-Made Disaster** refers to catastrophic events caused directly or indirectly due to **human action, negligence, intent, or failure of systems**.
- Distinguished from natural disasters, which result from **natural hazards** (e.g., floods, earthquakes).

Examples include:

- Industrial/chemical accidents (e.g., Bhopal Gas Tragedy)
- Fires and explosions (e.g., Mundka fire, 2022)
- Structural failures (e.g., Gambhira-Mujpur bridge Collapse, 2025)
- Transport accidents (rail, aviation, maritime)
- Biological/chemical threats and warfare
- Cyber-attacks and data breaches
- Terrorism and armed conflicts

Factors Contributing to Poor State of Public Infrastructure in India

Administrative Inefficiency and Corruption:

- Poor governance leads to the use of sub-standard materials, lack of compliance with engineering design codes, and minimal on-site supervision.
- Absence of accountability mechanisms fuels systemic corruption, affecting quality.

L1 Contract Bidding Method (Lowest Bidder):

- The "L1 approach" awards infrastructure contracts to the lowest financial bidder, often disregarding technical competence, past performance, or quality standards.
- This incentivizes cost-cutting on materials and labour.
- **Example:** Collapse of the Morbi suspension bridge (2022), awarded to a private firm lacking adequate expertise, despite safety concerns.

Inadequate Infrastructure Funding:

- As per CRISIL estimates, India needs 7–8% of GDP annually in infrastructure investment, but actual investment remains at only 4.6%.
- This results in delayed projects, maintenance backlogs, and dependence on Public-Private Partnerships.

Poor and Infrequent Safety Audits:

- Many structures collapse despite passing technical and safety audits, indicating either incompetence or compromise in auditing procedures.
- Safety audits are often not mandatory or carried out by the executing agency itself, posing a conflict of interest.

Other Structural Factors:

- Demand-supply mismatch: Rapid urbanization and industrialization have outpaced infrastructure creation.
- Environmental/geographical causes: Climate extremes such as floods, erosion, and high seismic activity threaten structural integrity.

Measures Required to Address Infrastructure Challenges

Benchmarking Infrastructure Capacity and Quality:

- Regular audits of infrastructure performance both in physical and qualitative terms must be made mandatory.
- Create dashboards and indices at national/state level to track underperforming assets.

Mandatory Adoption of Quality cum Cost Based Selection (QCBS):

- QCBS balances technical expertise and cost while awarding contracts, leading to better long-term outcomes.
- Reduces the risk of substandard execution under L1 model.

Independent, Periodic Safety Audits:

- Must be conducted by third-party expert agencies, separate from implementing or operating entities.
- Should include structural health monitoring using sensor-based technologies, especially for old bridges, dams, etc.

Key Government Initiatives to Boost Infrastructure Development

National Infrastructure Investment Fund (NIIF):

- A sovereign wealth fund created to attract foreign and domestic institutional investment into commercially viable infrastructure projects.
- Operates via master funds, sector-specific funds, and strategic partnerships.

National Infrastructure Pipeline (NIP):

- Targets INR 111 lakh crore investments across sectors like energy, roads, railways, and urban infrastructure from 2020 to 2025.
- Involves both Centre, States, and private sector, with emphasis on prioritized project identification and real-time tracking via Project Monitoring Group (PMG).

India Infrastructure Finance Company Ltd. (IIFCL):

- A wholly government-owned NBFC under Ministry of Finance.
- Provides long-term debt financing to PPP and other infrastructure projects to improve financial viability.

Viability Gap Funding (VGF):

- Used to make unviable but socially necessary projects feasible, especially in rural or remote regions.
- **Example:** UDAN scheme under civil aviation for regional air connectivity.

New Public-Private Partnership Models (e.g., Hybrid Annuity Model - HAM):

- Combines EPC (Engineering, Procurement, and Construction) and BOT (Build-Operate-Transfer) models.
- Government bears 40% upfront cost, reducing private player's risk and encouraging participation.

Mahi River

- Mahi is a **west-flowing interstate river** in India.
- It flows through **Madhya Pradesh, Rajasthan, and Gujarat**.
- **Total Length:** Approximately **583 km**.
- **Total Drainage Area:** Around **34,842 sq. km**.
- It is one of the **few rivers in peninsular India** that flows westward and drains into the **Arabian Sea**.

Geographical Uniqueness:

- **Only river in India** that crosses the **Tropic of Cancer twice**.
- Forms a **distinct 'U'-shaped bend** in **Banswara district** of Rajasthan.
- Empties into the **Gulf of Khambhat** (Arabian Sea), forming an **estuary**, not a delta.

Origin and Flow Path:

- **Originates** near **Bhopawar village**, **Dhar district**, **Madhya Pradesh**, from the **northern slopes of the Vindhyachal Range**, at an elevation of ~500 m.
- Flows **southward for 120 km** in Madhya Pradesh.
- Enters **south-eastern Rajasthan** (Vagad region), especially **Banswara district**.
- After forming a U-turn, it flows into **Gujarat**, eventually meeting the Arabian Sea.
- **Major Tributaries:** Som River, Anas River, Panam River

Key Infrastructure:

- **Mahi Bajaj Sagar Dam** – Located in Banswara, Rajasthan.
- **Kadana Dam** – Located in Gujarat.
- Both dams are used for **irrigation, flood control, and hydroelectric power**.

PYQ:

Q: "Vulnerability is an essential element for defining disaster impacts and its threat to people. How and in what ways can vulnerability to disasters be reduced?" (2020)

CLOUDBURSTS IN HIMACHAL PRADESH

Context

On July 2025, ten cloudbursts, three flash floods, and a landslip struck various parts of Mandi district in Himachal Pradesh, resulting in 13 confirmed deaths and 29 people still missing, as of July 3. Rescue operations continue across the Gohar, Thunag, and Karsog subdivisions.

Cloud Burst:

- A **cloudburst** is defined by the India Meteorological Department (IMD) as an extreme weather event characterized by **more than 10 cm of rainfall within one hour over an area of approximately 10 square kilometers**.
- These events are **localized**, highly intense, and usually occur with **minimal or no prior warning**.
- Cloudbursts are commonly associated with **thunderstorms, lightning, and hail**, and are most frequently observed in **mountainous regions**, particularly the **Himalayan belt**.

Causative Factors

- **Orographic Lifting:** Moist monsoonal winds are forced upwards along mountain slopes, leading to rapid cooling and condensation, resulting in torrential precipitation.
- **Strong Convective Currents:** Upward air currents suspend raindrops in the atmosphere, allowing them to accumulate. A sudden weakening of these currents results in the abrupt release of accumulated water.
- **Monsoon Dynamics:** As monsoon clouds from the **Bay of Bengal** or **Arabian Sea** move northward and encounter the Himalayas, they release significant amounts of rainfall in a short span of time.
- **Complex Topography:** The irregular terrain of the Himalayan region further amplifies localized convective activity.

Distinction Between Cloudbursts and Normal Rainfall

- Unlike normal rainfall, a cloudburst is:
  - **Intensely concentrated** in both time and space.
  - **Sudden and highly destructive**, often resulting in flash floods and landslides.
  - Difficult to forecast due to its **micro-scale nature**.

Vulnerable Regions in India

- **Western Himalayas:** Jammu & Kashmir, Himachal Pradesh, Uttarakhand.
- **Eastern Himalayas:** Sikkim, Arunachal Pradesh.
- **Western Ghats:** Kerala, Karnataka.
- **Northeastern Hills:** Nagaland, Manipur, Mizoram.

Notable Incidents

- **Uttarakhand (July 2021):** Cloudbursts in Chamoli, Uttarkashi, and Pithoragarh led to extensive flash flooding, landslides, and loss of life and infrastructure.
- **Himachal Pradesh (August 2020):** Cloudbursts in Kullu, Lahaul-Spiti, and Kinnaur triggered severe landslides and washed away roads and bridges.
- **Himachal Pradesh (August 2025):** Cloudbursts in Mandi and Kullu

Consequences

- **Flash Floods:** Rapid and localized rise in water levels, typically occurring within 3 to 6 hours of rainfall.

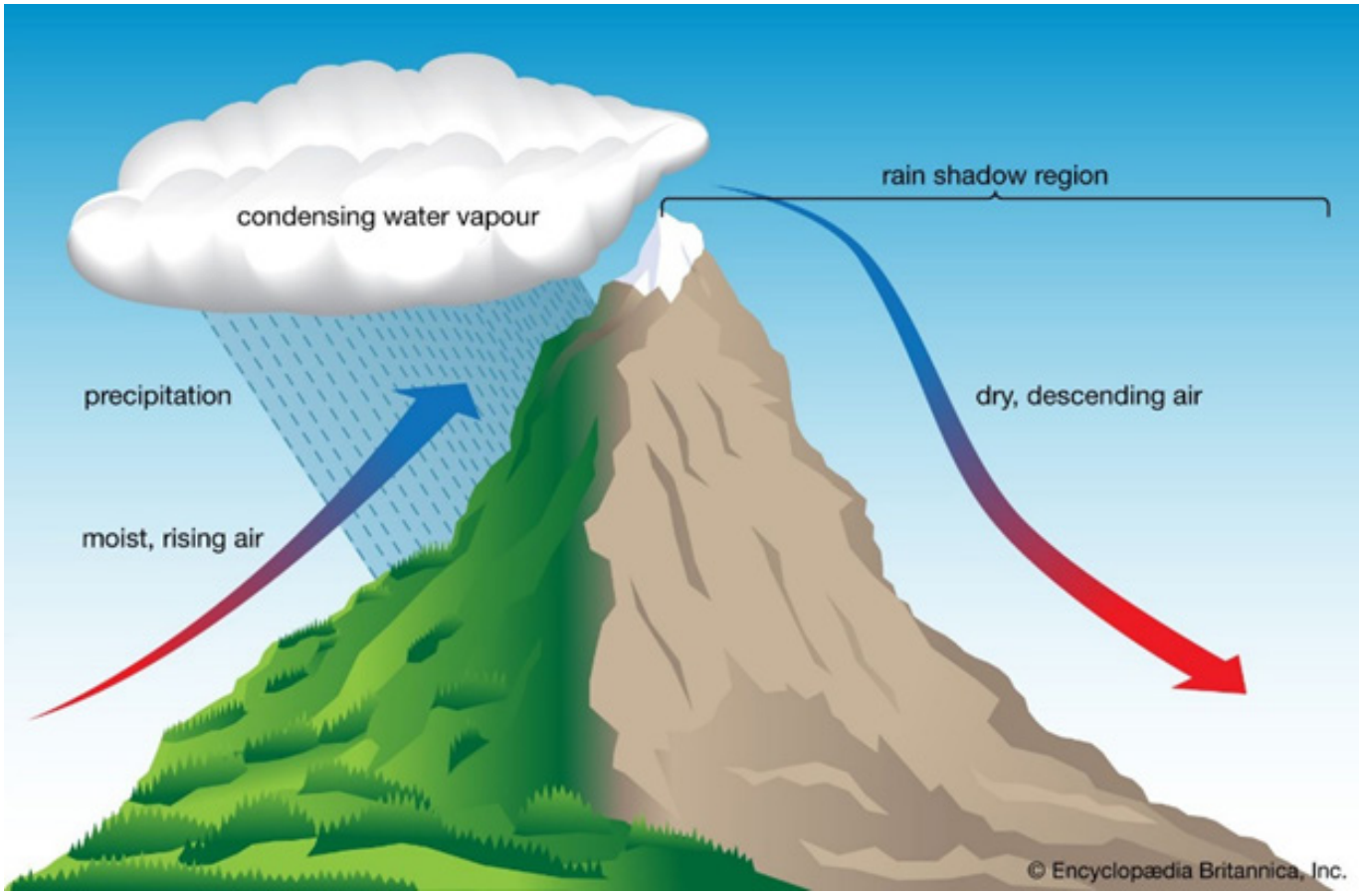

FIGURE NO. 02

- **Landslides:** Triggered by saturation of soil, leading to mass movement of debris, particularly in unstable hilly terrain.
- **Mudflows:** Dense and high-viscosity flows of water mixed with silt and sediment; capable of causing irreversible geomorphological changes.
- **Human and Economic Losses:** Displacement of communities, loss of lives, destruction of roads, bridges, and agricultural land.

Mitigation and Risk Reduction Strategies

- **Early Warning Systems:** Deployment of Doppler weather radars and satellite-based real-time monitoring to improve short-term forecasting.
- **Urban Planning:** Development of efficient stormwater drainage systems, flood-resistant infrastructure, and regulated land use.
- **Watershed and Slope Management:** Afforestation, check dams, terracing, and soil conservation techniques to reduce runoff and erosion.
- **Public Awareness and Training:** Community-level education and emergency preparedness drills in high-risk zones.
- **Policy and Regulation:** Enforcement of construction norms in ecologically sensitive zones and mandatory environmental impact assessments.
- **International Collaboration:** Sharing of hydrometeorological data, technology transfer, and regional cooperation in Himalayan disaster management.

Landslide

- A **landslide** is the **downward movement of rock, earth, or debris** due to gravity.
- **Types:**
  - **Debris flows**
  - **Rockfalls**
  - **Slumps**
  - **Creep**

Causes:

- **Natural Triggers:** Heavy rainfall, earthquakes, water seepage, volcanic activity.
- **Anthropogenic Factors:** Deforestation, hill cutting, unscientific construction, mining.
- **Geological Factors:** Slope angle, weak rock strata, fault lines.

Landslide-Prone Areas in India:

- **12.6% of India's land** is landslide-prone (~0.42 million sq. km).
- Most vulnerable zones:
  - **North-Western and North-Eastern Himalayas** (Uttarakhand, Himachal, Sikkim, Arunachal)
  - **Western Ghats and Nilgiris**
  - **Konkan coast and Eastern Ghats**

Notable Examples:

- **Kedarnath Landslide (2013):** Cloudburst triggered, ~5,700 deaths.
- **Chamoli (2021):** Glacier burst triggered landslide and flash flood.
- **Wayanad, Kerala (2024):** Monsoon-triggered landslides.

Flash Flood

- A **flash flood** is a **sudden, high-intensity flood** event occurring within **6 hours** of heavy rainfall or other triggers.

Causes:

- **Intense Rainfall** exceeding soil absorption and drainage capacity.
- **Dam/levee breaches**, **glacial lake outbursts**, **debris or ice jams**.
- **Urbanization**: Impermeable surfaces reduce infiltration and increase runoff.
- **Snowmelt**: Sudden rise in temperature causes rapid melting in mountains.

Impact:

- Sudden inundation of low-lying areas.
- High casualty risk due to limited warning time.
- Infrastructure, crops, and transportation systems are severely affected.

Major Incidents:

- **Mumbai (2005):** 944 mm rain in 24 hours caused urban flash flooding.
- **Uttarakhand (2013):** Rain-induced flash floods and landslides devastated Kedarnath.
- **Himachal Pradesh (2023):** Cloudburst-induced flash floods and slope failure.

SEVERE WATERLOGGING IN DELHI

CONTEXT

On July 9, 2025, heavy rainfall accompanied by strong winds and lightning caused **severe waterlogging and traffic disruptions** across several key areas in Delhi. The India Meteorological Department (IMD) issued a **Red Alert** for further rainfall within the next 24 hours.

Urban flooding

Definition and Nature

- **Urban flooding** refers to the inundation of land or property in densely populated areas due to excessive rainfall, poor drainage, or overflowing water bodies.
- Unlike rural floods, it is intensified by **impervious urban surfaces** such as concrete and asphalt that hinder natural percolation of rainwater.

- Consequences include waterlogging, traffic paralysis, infrastructure damage, and health hazards.

Causes of Urban Flooding in India

Rapid Urbanisation and Impervious Surfaces

- Drastic increase in built-up areas (e.g., 99.9% in Mumbai over 27 years).
- This leads to **30x more runoff**, burdening outdated urban drainage systems.

Obsolete Drainage Infrastructure

- Systems often date back several decades (e.g., Delhi's 1976 master plan).
- Choked drains due to poor maintenance and increasing waste volumes reduce capacity.

Climate Change and Extreme Rainfall Events

- Increase in **intensity and frequency** of short-duration, high-intensity rainstorms.
- Example: Chennai recorded **1218.6 mm rainfall** in Nov 2015, highest in a century.
- Central India: **Tripling of extreme rain events since 1950**.

Loss of Urban Water Bodies

- Lakes, wetlands, and ponds are encroached for real estate.
- **Example:** Bengaluru has lost **79% of its lakes**, reducing water absorption capacity.

Construction in Eco-Sensitive Zones

- Unregulated building activities alter natural drainage flows.
- E.g., Unplanned development near Kedarnath contributed to 2013 flood devastation.

Inadequate Solid Waste Management

- India generates 1.5 lakh tonnes of MSW/day; only **<30% treated**.
- Uncollected waste chokes stormwater drains and causes backflow.

Coastal Vulnerability

- Coastal cities like Mumbai, Chennai face dual threats: **sea-level rise** + **subsidence**.
- By 2050, Mumbai could face **25% increase in flash floods** and **0.5m rise in sea level**.

Impacts of Urban Flooding

Economic Losses

- Mumbai (2005): USD 2 billion loss; Chennai (2015): USD 3 billion loss.
- World Bank projects **USD 1 trillion/year global urban flood damage by 2050**.

Public Health Hazards

- Exposure to sewage-contaminated water spreads diseases (e.g., Leptospirosis).
- Post-floods in Patna (2019) saw a spike in **malaria and diarrhoea**.

Transport and Productivity Disruption

- IT sector in Bengaluru (2022): Loss of **₹225 crore/day** due to commuting halt.

Disproportionate Impact on Urban Poor

- Slum dwellers in low-lying areas face highest vulnerability.
- **Example:** 41–42% of Mumbai's population lives in slums located in flood-prone zones.

Mental Health and Trauma

- Flood-affected populations show **30–40% prevalence of PTSD**.
- Long-term psychological impacts reduce societal productivity and resilience.

Damage to Cultural Heritage

- Flooding in Hampi (2019) severely affected a **UNESCO World Heritage Site**.
- Loss of cultural landmarks also affects tourism-based urban economies.

Government Initiatives

- **Jal Shakti Abhiyan (JSA):** Promotes water conservation and aquifer recharge.
- **Amrit Sarovar Mission:** Rejuvenation of water bodies for resilience.
- **Atal Bhujal Yojana:** Focuses on sustainable groundwater management.
- **AMRUT 2.0:** Aims for stormwater management and urban drainage reform.

Recommended Solutions for Flood Resilience

Sponge Cities

- Use of **permeable pavements**, **rain gardens**, and **bioswales**.
- China's pilot sponge cities retain **70–90% of annual rainfall**.

Smart Stormwater Systems

- IoT-enabled sensors monitor **real-time water flow**.
- Singapore's SWAN project is a global benchmark.

Urban Wetland Protection

- **Example**: **East Kolkata Wetlands** treat **750 MLD** wastewater naturally.
- Wetlands absorb **1 million gallons/acre** of rainwater.

Green Buildings as Rain Barriers

- Vertical forests like **Bosco Verticale (Milan)** reduce runoff and air pollution.
- Skyscrapers can absorb up to **70% of rooftop rainwater**.

Flood-Resilient Architecture

- Examples include **FLOAT House (New Orleans)** and **amphibious housing**.
- Elevated, permeable design protects from surface water accumulation.

Community-Led Interventions

- Local rainwater harvesting, community-based planning (e.g., Nagdarwadi, Maharashtra).
- Public spaces like **Rotterdam's water squares** serve dual purpose: recreation + flood buffering.

SECTION -B

QUICK BYTES

KEELADI EXCAVATION

CONTEXT

ASI has granted permission to archaeologist P.S. Sriraman to prepare the final report on the third phase of Keeladi and Kodumanal excavations, addressing long-pending documentation amid earlier reporting controversies.

Keeladi Excavation:

Location and Background

- **Keeladi** is a small village located in **Sivaganga district**, about **12 km southeast of Madurai**, Tamil Nadu.
- Situated along the **Vaigai River**, it gained prominence following archaeological excavations starting in **2015**.
- The site lies within the cultural context of **ancient Tamil Nadu**, providing crucial insights into the **Sangam Age** and **early urban life** in South India.

Major Excavations

- Excavations have been conducted in **eight rounds** so far:
  - **First three** by the **Archaeological Survey of India (ASI)**
  - Subsequent ones by the **Tamil Nadu State Department of Archaeology (TNSDA)**
- Over **18,000 artefacts** have been unearthed from the site.

Key Archaeological Findings

Writing and Inscriptions

- Over **120 potsherds** with **Tamil-Brahmi inscriptions** discovered.
- Suggests **long survival and use** of script in the region.
- Indicates **literate society** during Early Historic Period.

Industrial and Economic Activities

- **Pottery Industry**: Heaps of locally made pottery.
- **Weaving Industry**: Evidence from spindle whorls, copper needles, terracotta seals, and yarn stones.
- **Dyeing and Bead-Making**: Indicated by terracotta spheres and glass beads.
- **Luxury Crafts**: Gold ornaments, copper goods, ivory bangles, shell artefacts.
- **Trade Evidence**: Agate and carnelian beads suggest **external trade**.

Entertainment and Lifestyle

- Discovery of **dice, terracotta gamesmen**, and hopscotch markings reflect leisure activities.
- Presence of **luxury and ornamental items** suggests a **prosperous, artistic, and culturally rich society**.

Historical Significance

Sangam Age Link

- Originally dated to **3rd century BCE–3rd century CE**.

- Recent ASI findings push the origin to **as early as 800 BCE**.
- Provides material evidence of life, economy, and script during **Sangam Period**.

Iron Age–Early Historic Transition

- Keeladi helps **bridge the gap** between **Iron Age (12th–6th century BCE)** and the **Early Historic Period (6th–4th century BCE)**.
- Offers a continuous **cultural evolution** record in South India.

Comparison with Indus Valley Civilization

- Although separated by a **1000-year gap**, Keeladi is seen as part of a **"Vaigai Valley Civilization"**.
- Like the **Indus Valley Civilization**, Keeladi shows:
  - Urban planning (brick structures)
  - Internal and external trade
  - Literacy and symbolic artefacts
- However, cultural continuity is **mediated through the Iron Age material**.

Civilizational Features

- **Urban Characteristics**: Brick houses, well-planned streets.
- **Social Structure**: Artefacts suggest a stratified and organised society.
- **Trade and Commerce**: Internal and external trade routes evident.
- **Cultural Continuity**: Signs of advanced knowledge systems, art, and early forms of economy.

DR. SYAMA PRASAD MOOKERJEE

CONTEXT

The Ministry of Culture has initiated a two-year nationwide commemoration (2025–2027) of the 125th birth anniversary of Dr. Syama Prasad Mookerjee, marked by the release of a commemorative coin and stamp, exhibitions, and cultural performances celebrating his legacy in nation-building, education, and constitutional nationalism.

Dr. Syama Prasad Mookerjee:

- He was the founder of Bharatiya Jana Sangh (1951), the ideological predecessor of the present-day Bharatiya Janata Party (BJP).
- Served as Vice Chancellor of Calcutta University at the age of 33—the youngest ever.
- Member of Nehru's Interim Cabinet (1947); held the Industry and Supply portfolio.
- Resigned from the Cabinet over ideological differences, especially concerning Article 370 and Kashmir policy.

Opposition to Article 370:

- Famously opposed the special status granted to Jammu & Kashmir under Article 370.
- **Coined the slogan:** "Ek desh mein do Vidhan, do Pradhan, aur do Nishan nahi chalenge."
- His arrest and mysterious death in 1953 while protesting in Kashmir remain significant in political discourse.

Role in National Unity and Education:

- Championed national integration post-Partition and resisted the exclusion of parts of Bengal and Assam from the Indian Union.
- Advocated for educational reforms, industrial self-reliance, and constitutional integrity.

Commemorative Measures:

- Release of a special coin and postage stamp.
- National-level outreach and exhibitions, including dramatizations of his life by NSD and CCRT.
- Commemoration to be observed across all states and union territories.

Institutional Recognition:

- The Syama Prasad Mookerjee Research Foundation and Ekatma Manav Darshan Pratishthan continue to preserve and promote his ideological and political contributions.

Polity & Governance

KARNATAKA INTER-STATE AND IRRIGATION WATER PROJECTS

CONTEXT

Karnataka has sought the Centre's approval for key water projects—Yettinahole, Kalasa-Banduri, and Upper Bhadra—and urged notification of the Krishna Water Disputes Tribunal-II award amid legal, environmental, and funding hurdles.

Yettinahole Project:

- Located in the Western Ghats region of **Hassan district**, it is a **drinking water project** aimed at diverting water from west-flowing streams to the drought-prone eastern districts of Karnataka.
- **Issue**: Facing objections from the **Ministry of Environment and Forests (MoEF)** regarding diversion of **423 acres of forestland**. The state has proposed compensatory afforestation through revenue land acquisition.

Kalasa-Banduri Nala Project:

- **Objective:** To divert water from the **Mahadayi River** (also called Mandovi in Goa) to meet drinking water needs in **Belagavi, Dharwad, and Gadag** districts.

- **Inter-State Dispute: Goa has raised objections**, citing ecological and water-sharing concerns. The case has been politically and legally contentious for years.

Upper Bhadra Project:

- **Type: Major lift irrigation project** to irrigate drought-prone regions.
- **Districts Covered: Chikkamagaluru, Chitradurga, Tumakuru, and Davanagere**.
- **Project Cost:** ₹21,473 crore;
- **Expected Benefit:** Irrigation of **2.25 lakh hectares**.
- **Issue**: Although ₹5,300 crore was allocated, the **Centre has not released funds yet**.

Krishna Water Disputes Tribunal-II Award:

- Karnataka is seeking **notification (gazette publication)** of the award which decides water sharing among **Maharashtra, Karnataka, Andhra Pradesh, and Telangana**.
- Non-notification hinders the implementation of state-level irrigation policies.

Constitutional and Statutory Framework:

- Inter-state river water disputes are governed by **Article 262** and the **Inter-State River Water Disputes Act, 1956**.
- Environmental approvals are under **Forest (Conservation) Act, 1980** and **Environment Protection Act, 1986**.

AGITATION OVER RESERVATION POLICY IN NAGALAND

CONTEXT

A coalition of five prominent Naga tribes in Nagaland has called for a re-evaluation of the 48-year-old reservation policy in State government jobs. They argue that the existing quota for 11 "backward" tribes is outdated and no longer reflects present-day socio-economic and educational conditions.

Reservation Policy in Nagaland (Since 1977):

- A reservation system was instituted for 11 "backward" tribes in Nagaland in 1977.
- The policy was continued indefinitely via a government order in 1989 without the mandated review in 1987.
- These tribes include seven from eastern Nagaland — a region with developmental challenges.

Committee's Argument for Review:

- The Committee on Review Reservation Policy (CRRP) argues that the 48-year-old policy no longer reflects current educational and socio-economic dynamics.
- The committee does not oppose reservation per se but calls for re-evaluation based on updated data and Census (next due in 2027).
- A commission was promised to be set up by June 17, 2025, but the government cited complexity and delayed the process.

Constitutional & Administrative Relevance:

- The issue involves Article 16(4) of the Constitution (reservation for backward classes).
- Nagaland enjoys special status under Article 371A, which gives the State autonomy over civil and customary laws.
- The matter may influence future delimitation and administrative reforms in the State.

Article 16(4) – Reservation in Public Employment

- **Article 16(4)** is a provision under **Part III** (Fundamental Rights) of the Indian Constitution.
- It states:
  - "Nothing in this article shall prevent the State from making any provision for the reservation of appointments or posts in favour of any backward class of citizens which, in the opinion of the State, is not adequately represented in the services under the State."

Constitutional Provision:

- Inserted by the **13th Constitutional Amendment Act, 1962** following the **1960 Naga Peace Accord**.
- **Article 371A(1)** states that **no Act of Parliament** shall apply to Nagaland in respect of:
  - **Religious or social practices of the Nagas**
  - **Naga customary law and procedure**
  - **Administration of civil and criminal justice involving decisions according to customary law**
  - **Ownership and transfer of land and its resources** ...unless the **Nagaland Legislative Assembly** decides so by a resolution.

BIHAR DOMICILE QUOTA REFORM

CONTEXT

The Bihar Cabinet has approved the application of the domicile rule to the existing 35% reservation for women in all state government jobs, marking a significant policy shift before the upcoming state elections.

Policy Overview

- In **January 2016**, Bihar introduced **35% horizontal reservation** for women across **all state government jobs**.

- Until now, the **domicile requirement** was not applied to this quota, allowing women from outside Bihar to avail the benefit.
- As of **July 2025**, only **women who are domiciled residents of Bihar** will be eligible under this 35% quota.

Domicile Criteria in Bihar

To qualify as a **domicile of Bihar**, a person must fulfill at least one of the following:

- Continuous residence in the state for **three years or more**.
- Ownership of **property or land** in the state.
- In case of women, **marriage to a domiciled resident** of Bihar.
- **Voter ID** is desirable but **not mandatory**.

Vertical and Horizontal Reservation:

Vertical Reservation

- Provided for **socially and educationally backward classes**: SCs, STs, and OBCs.
- Governed by **Article 16(4)** of the Indian Constitution.
- It is **group-specific** and applies **separately** to each reserved category.
- Vertical reservation is counted **independently and not shared** across other vertical groups.

Horizontal Reservation

- Refers to **cross-cutting reservations** for categories like:
  - **Women**
  - **Persons with Disabilities (PwDs)**
  - **Ex-servicemen**
  - **Transgender persons**
- Enshrined under **Article 15(3)** and supported by judicial interpretation.
- Applies **within each vertical category** (SC, ST, OBC, General).
- Ensures **fair representation** of special groups across all caste-based categories.

Application Mechanism

- Horizontal reservation is **interlocked** with vertical reservation.
- **For example:** If **35% horizontal reservation** is given to **women**:
  - Then **35% of each vertical category's seats** (e.g., SC, ST, OBC, General) must be filled by women candidates of that category.
- This avoids **double-counting** and ensures equitable distribution.

INDIA STRENGTHENS DIASPORA

CONTEXT

On the occasion of a diaspora outreach in Trinidad and Tobago, the Indian Prime Minister announced the extension of Overseas Citizens of India (OCI) card eligibility to sixth-generation Indian-origin individuals. This move aims to deepen India's engagement with the Girmitiya diaspora, who are descendants of indentured laborers sent abroad during the colonial era

Overseas Citizens of India (OCI) Card:

- The **OCI card** is issued to persons of Indian origin who are citizens of other countries (except Pakistan and Bangladesh).
- It provides a **lifelong visa**, exemption from registration with the Foreigners Regional Registration Office (FRRO), and certain **economic and educational rights**.
- OCI holders do **not have political rights** (i.e., no voting rights or right to hold public office).
- The announcement now includes **sixth-generation Girmitiya descendants** under its ambit, particularly those with roots in **Bihar and eastern Uttar Pradesh**.

Girmitiya Diaspora and Historical Context:

- Girmitiyas were indentured Indian laborers taken to British colonies such as Mauritius, Fiji, Trinidad and Tobago, Guyana, Suriname, and parts of Southern and Eastern Africa between the 1830s and early 20th century.
- The term originates from the word "agreement" (mispronounced as "girmit"), referring to their labor contracts.
- India observes Pravasi Bharatiya Divas (January 9) to honor the contribution of overseas Indians, especially the Girmitiya community.

India's Diaspora Diplomacy:

- India has a **35-million-strong diaspora** across 200+ countries, the **largest in the world** (according to UN DESA, 2020).
- The government has launched initiatives such as the **Global Pravasi Rishta Portal**, **Bharat Ko Janiye Quiz**, and **Know India Programme** to engage youth of Indian origin abroad.
- The diaspora is often referred to as **Rashtradoots (ambassadors of India)**, reflecting their role in projecting Indian culture and values globally.

PARAKH DISSEMINATION PORTAL

CONTEXT

The PARAKH Rashtriya Sarvekshan Dissemination Portal has been recently launched to provide open access to national and state-level student performance data, helping States/

UTs to develop evidence-based strategies for improving learning outcomes, in alignment with the National Education Policy (NEP) 2020.

What is PARAKH?

- **Full Form**: *Performance Assessment, Review, and Analysis of Knowledge for Holistic Development.*
- **Established by**: **NCERT** in **2023** under the mandate of **NEP 2020**.
- **Objective**: To **standardize assessments**, set benchmarks, and guide learning evaluations across **school boards** in India.

Key Mandates and Functions of PARAKH:

Standardization of Assessments

- Harmonizes learning outcomes across States and Union Territories.
- Establishes **norms and guidelines** for competency-based evaluation.

Equivalence of School Boards

- Ensures **academic parity** and mobility of students across school boards.

Large-Scale Achievement Surveys (LSAS)

- Conducts **national-level surveys** such as **Rashtriya Sarvekshan 2024** to monitor learning outcomes.

Development of Holistic Progress Cards

- Aligned with the NEP's vision of **360-degree student assessment** across all stages of schooling.

Capacity Building

- Trains assessment professionals and educators in **competency-based education**.

Significance of the Dissemination Portal:

- Provides **open-access** data on **student performance** to education planners, researchers, and the public.
- Facilitates **data-driven policy planning** and **targeted interventions** at state and district levels.
- Aids in **bridging learning gaps** and addressing **equity and inclusion** in school education.

EMPLOYMENT-LINKED INCENTIVE (ELI)

CONTEXT

The Union Cabinet has approved the Employment-Linked Incentive (ELI) Scheme with an outlay of ₹99,446 crore, aiming to create over 3.5 crore jobs over two years, especially in the manufacturing sector, and to be implemented by the Employees' Provident Fund Organisation (EPFO).

Employment-Linked Incentive (ELI)

Objective of the Scheme:

- The **ELI Scheme** aims to **incentivize job creation** in the **formal sector**, particularly manufacturing.
- Part of a **five-pronged strategy** announced in Budget 2024–25 to improve youth employability and formal job access.

Scheme Features:

- **Outlay**: ₹99,446 crore.
- **Timeframe**: From **August 1, 2025** to **July 31, 2027**.
- **Target**: Creation of over **3.5 crore jobs**; direct benefits to **1.92 crore newly employed individuals**.
- EPFO as implementing agency.

Incentive Structure:

Employee Incentives:

- Workers earning **up to ₹1 lakh/month** will get an **EPF wage equivalent up to ₹15,000**, paid in **two installments**:
  - 1st after 6 months of continuous service.
  - 2nd after 12 months of continuous service.
- Part of the incentive will be deposited in a **locked savings instrument**, withdrawable later.

Employer Incentives:

- Employers registered with **EPFO** to get up to **₹3,000/ month per new employee** for two years (sustained employment ≥6 months).
- **For manufacturing sector**: benefits extended to 3rd and 4th years as well.

Key Concerns and Challenges:

- **EPFO's Mandate**: Primarily a custodian of employee savings, not designed for employment creation or subsidy disbursal.
- **Transparency**: Ambiguity about how funds will be allocated and monitored.
- **Need for Separate Implementation Agency**: Suggestions to create a **dedicated body** to oversee ELI.
- **Structural Economic Issues**: Experts highlight the lack of attention to **economic slowdown**, **weak demand**, and **low purchasing power**.

FIRST-EVER DIGITAL CENSUS IN 2027

CONTEXT

The Registrar General of India (RGI) has announced that the 2027 Census will be India's first digital Census, introducing self-enumeration via a web portal and the use of mobile applications for real-time data collection, with the aim of ensuring faster availability of Census data.

First Digital Census (2027):

- For the first time, **digital tools and platforms** will be used to collect demographic data.
- Data will be transmitted **electronically to a central server**, ensuring **reduced lag in data availability**.
- **Self-enumeration** will be enabled via a **dedicated web portal**.
- Mobile applications (Android and iOS) will support data collection in **English, Hindi, and regional languages**.

Comparison with Previous Censuses:

- The last completed Census was **2011**; the 2021 Census was postponed due to the COVID-19 pandemic.
- In traditional censuses, **primary data took 2–3 years** to become publicly available.
- The 2027 digital approach is aimed at **real-time or early data dissemination**.

Phased Implementation:

- The Census will be conducted in **two phases**, similar to earlier patterns (House-listing followed by Population Enumeration).
- Residents can participate in **both phases via self-enumeration**.

Institutional Coordination:

- **All States/UTs** have been directed to appoint **nodal officers** for overseeing implementation and coordination.
- This marks a **federal approach** to data collection, integrating both Centre and State mechanisms.

Relevance of Census in Governance:

- Census data is foundational for:
  - **Delimitation of constituencies**
  - **Reservation of seats** (SC/ST)
  - **Resource allocation** and **welfare planning**
  - Monitoring **migration**, **urbanisation**, and **socio-economic indicators**

Registrar General of India (RGI)

Establishment and Institutional Role

- The **Office of the Registrar General of India (RGI)** was established in **1949** by the Government of India under the **Ministry of Home Affairs**.
- The **Registrar General** also serves as the **Ex-Officio Census Commissioner of India**.
- The position is usually held by a **Joint Secretary-level civil servant**.

Key Functions of the RGI

- **Census of India (Decennial):**
  - Conducts the **Census every 10 years**, which provides granular data on **population, socio-economic, and geographic indicators**.
  - Last completed Census: **2011**.
  - Upcoming: **2027** (First Digital Census).
- **Linguistic Survey of India (LSI):**
  - Conducted along with the Census to assess **linguistic diversity**.
  - The first LSI was conducted by **George Abraham Grierson**, completed in **1928**.
  - Modern surveys focus on **language use, dialects, and linguistic distribution**.
- **Civil Registration System (CRS):**
  - A **continuous, real-time population database**, mandated for **recording births and deaths**.
  - Operates under the **Registration of Births and Deaths (RBD) Act, 1969**.
  - The **RBD Act was amended in 2023**, making **digital registration on a central portal mandatory from October 1, 2023**.
- **Vital Statistics Compilation:**
  - Publishes **Annual Vital Statistics Reports** derived from CRS.
  - Used for **policy formulation, public health monitoring, and demographic analysis**.

Legal Framework

- **Census Act, 1948**: Governs the **conduct of Census** in India.
- **Registration of Births and Deaths (RBD) Act, 1969**:
  - Legal basis for **compulsory registration** of all births and deaths.
  - **Section 12**: Empowers the Registrar to issue **birth/death certificates**.
  - **2023 Amendment**: Mandates use of a **Central Digital Portal** for real-time registration.

PM MODI CONFERRED BRAZIL'S HIGHEST CIVILIAN HONOUR

Context:

Prime Minister Narendra Modi was conferred the "Grand Collar of the National Order of the Southern Cross"—Brazil's highest civilian honour for foreign dignitaries—during the 17th BRICS Summit 2025 in Rio de Janeiro, recognising India-Brazil strategic ties.

About the National Order of the Southern Cross:

- **Instituted:** 1822 by Emperor Pedro I of Brazil.
- **Type:** Brazil's highest national honour conferred exclusively on foreign nationals.
- **Classes:** The "Grand Collar" is the highest grade in the Order.
- **Eligibility:** Heads of State, Heads of Government, and other foreign dignitaries.

India-Brazil Bilateral Relations:

- **Established:** Formal diplomatic relations in 1948.
- Both are members of BRICS, G20, IBSA, and BASIC groupings.
- The relationship was elevated to a Strategic Partnership in 2006 during President Lula's earlier term.
- Areas of cooperation include: bioenergy, agriculture, space, defence, climate diplomacy, and UN reform.

Other Global Honours Conferred on PM Modi:

- Order of Zayed – UAE (2019)
- Order of St. Andrew the Apostle – Russia (2019)
- Legion of Merit – USA (2020)
- Order of the Nile – Egypt (2023)
- Order of the Druk Gyalpo – Bhutan (2021)

INDIA–NAMIBIA STRENGTHEN STRATEGIC COOPERATION

CONTEXT

On 9 July 2025, the Indian Prime Minister addressed the National Assembly of Namibia, reaffirming India's commitment to democratic values, development partnership, and South-South cooperation, while announcing new bilateral initiatives.

India–Namibia Bilateral Relations:

- India supported Namibia's **liberation movement** and hosted the first diplomatic office of SWAPO in New Delhi.
- India contributed to UN peacekeeping operations during Namibia's transition to independence.
- Over **1,700 Namibian nationals** have benefited from Indian scholarships and capacity-building initiatives.

Digital and Financial Cooperation:

- Namibia became one of the first African countries to adopt India's **Unified Payments Interface (UPI)** platform, enhancing digital financial inclusion.

Health Diplomacy:

- India offered **Bhabhatron radiotherapy machines** for cancer care.
- Namibia was invited to join India's **Jan Aushadhi programme**, which reduces medicine costs by 50–80%.

Education and Skill Development:

- India supported the establishment of:
  - A **Centre of Excellence in IT**
  - **India Wing** at the University of Namibia
  - An **Entrepreneurship Development Centre** to promote start-ups.

Conservation and Environment Diplomacy:

- Namibia played a key role in the **reintroduction of cheetahs** to India in 2022.
- Both countries collaborate through the **International Solar Alliance (ISA)**, **Coalition for Disaster Resilient Infrastructure (CDRI)**, and **International Big Cats Alliance (IBCA)**.

India–Africa and Global South Engagement:

- India's development cooperation in Africa is valued at over **USD 12 billion**, covering infrastructure, health, education, and innovation.
- India advocates for Africa's equitable representation in global governance, demonstrated by support for the **African Union's permanent G20 membership**.
- India aligns with Africa's **Agenda 2063**, focusing on **industrialisation**, **value creation**, and **mutual development**.

Namibia's Highest Civilian Award to Indian Prime Minister

Occasion:

- During a **State Visit to Namibia**, the Indian Prime Minister was **conferred Namibia's highest civilian award — "Order of the Most Ancient Welwitschia Mirabilis."**

Significance of the Award:

- This marks the **first time** an **Indian leader** has received this honour.
- The award is a **symbol of deep respect and strategic friendship** between India and Namibia.
- It reflects **Namibia's recognition** of India's role in promoting **South-South cooperation**, **developmental diplomacy**, and **bilateral solidarity**.

12. BRAZIL BRICS SUMMIT

CONTEXT

Brazil is hosting the 17th BRICS Summit in 2025, marking the first major summit of the newly expanded 11-member BRICS bloc, with a focus on Global South cooperation and inclusive governance reform.

About BRICS

Type of Grouping:

- BRICS is an **intergovernmental informal grouping** of emerging economies aimed at fostering cooperation in political, economic, and developmental spheres.

Founding Members:

- **Originally BRIC**: Brazil, Russia, India, China
- **South Africa** joined in **2010**, making it **BRICS**.

Recent Expansion (2024):

- **New Members: Iran, UAE, Egypt, Ethiopia**
- **Saudi Arabia**: Invited but **yet to formalize** its membership.
- **Argentina**: Was expected to join but **withdrew** decision to join in 2024.
- **Total Members as of 2025:** 10 confirmed; pending confirmation for Saudi Arabia.
- **First Summit:** Held in **Yekaterinburg, Russia (2009)**.

Significance of BRICS

Demographic and Economic Weight:

- Represents approximately **46% of the world's population**.
- Accounts for **35% of global GDP** (prior to inclusion of Indonesia).

Geopolitical Counterbalance:

- Seen as a **counterweight to the G7** and other Western-led groupings.
- Challenges **Western dominance** in global economic and financial institutions.

Promoter of Multipolarity:

- Advocates for a **multipolar world order** rooted in **sovereign equality**, **non-interference**, and **developmental equity**.

Present Priorities and Long-Term Vision

- **De-Dollarisation and Financial Sovereignty:**
  - Proposes **reducing dependency on the US Dollar** in international transactions.
  - Aims to strengthen **local currencies**, establish **BRICS Pay**, and promote **bilateral and multilateral non-dollar settlements**.
- **Global Institutional Reforms:**
  - Seeks **reforms in Bretton Woods Institutions** like the **IMF and World Bank**.
  - Demands restructuring of the **UN Security Council** to reflect current geopolitical realities.
- **Inclusivity and Development:**
  - Emphasis on **inclusive development**, particularly in the **Global South**.
  - Promotes **sustainable development**, **technological cooperation**, and **healthcare resilience**.
- **Strategic Autonomy:**
  - Advocates for **strategic autonomy** of member states in global decision-making forums.
  - Encourages **South-South cooperation** and **joint economic initiatives**.

17th BRICS Summit:

- The official theme is: "Strengthening Global South Cooperation for More Inclusive and Sustainable Governance".
- Brazil's presidency has identified six core areas of cooperation:
  - Global health cooperation
  - Trade, investment, and finance
  - Climate change
  - Artificial Intelligence (AI) governance
  - Peace and security architecture
  - Institutional development

Significance for India:

- As a founding BRICS member, India plays a key role in influencing agenda-setting, especially in areas like AI governance, multilateralism, and sustainable development.
- India's strategic participation aligns with its broader Act East, Energy Security, and South-South Cooperation strategies.

INDIA–TRINIDAD AND TOBAGO

CONTEXT

During PM Narendra Modi's visit to Trinidad and Tobago, both nations signed six bilateral agreements to enhance cooperation in pharmaceuticals, finance, agriculture, and digital education. Trinidad and Tobago also joined India-led global initiatives such as the Coalition for Disaster Resilient Infrastructure (CDRI) and the Global Biofuel Alliance (GBA).

Trinidad and Tobago

Bilateral Agreements:

- At least six MoUs were signed to promote cooperation in the financial and pharmaceutical sectors, thereby positioning India as a prominent player in the Caribbean market.
- Notably, an MoU was signed for **Indian Grant Assistance for Quick Impact Projects (QIPs)**, capped at **$50,000 per project**, with a maximum of **five projects per financial year**.

Multilateral Engagements:

Trinidad and Tobago joined two key India-led global initiatives:

- **Coalition for Disaster Resilient Infrastructure (CDRI)** – a UN-recognised coalition aimed at promoting disaster-resilient infrastructure globally.
- **Global Biofuel Alliance (GBA)** – a multilateral platform to promote sustainable biofuels and foster technology sharing and policy coordination.

Developmental Support Initiatives by India:

- India will gift 2,000 laptops to school students in Trinidad and Tobago to support digital education.
- A grant of $1 million worth of agro-machinery was extended to the National Agricultural Marketing and Development Corporation (NAMDEVCO).
- India committed technical assistance in millet cultivation, seaweed-based fertilizers, and natural farming practices.

Soft Power and Strategic Footprint:

- The gesture of gifting laptops and promoting education supports India's digital diplomacy and capacity-building efforts in the Global South.
- Through these engagements, India is strengthening its Act East & Caribbean Outreach strategy and expanding influence via development diplomacy and South-South cooperation.

Geostrategic Significance:

- These developments align with India's effort to secure allies among Small Island Developing States (SIDS), which are crucial stakeholders in global climate and disaster-resilience negotiations.
- This also reflects India's increasing role as a development partner offering non-reciprocal, demand-driven assistance.

Trinidad and Tobago

Geographical Features:

- **Island Geography**:
  - Consists of two main islands: **Trinidad** (larger and more populous) and **Tobago**.

Figure No. 01

- Located near the **Orinoco Delta** and continental shelf of **South America**—making it geologically distinct from many other Caribbean islands.

- **Mountain Ranges**:
  - The **Northern Range** in Trinidad is a geologic extension of the **coastal ranges of the Andes Mountains** in Venezuela.
  - These ranges provide rich biodiversity and affect regional microclimates.
- **Highest Point**:
  - **Mount Aripo** (940 meters) – located in the Northern Range, this is the highest elevation in the country.
- **Major Rivers**:
  - **Caroni River**: Vital for agriculture and freshwater needs; it flows westward into the Gulf of Paria.
  - **Ortoire River**: Flows east into the Atlantic; significant for the southeastern drainage system.
- **Pitch Lake** (in La Brea, Trinidad):
  - **World's largest natural deposit of asphalt**.
  - Estimated to hold **10 million tons** of asphalt, used for road surfacing globally.
  - It is both a **geological wonder and an economic asset**, attracting scientific and tourism interest.

(See Figure No. 01 at previous page)

IAEA WITHDRAWS FINAL INSPECTORS FROM IRAN

CONTEXT

The International Atomic Energy Agency (IAEA) has withdrawn all its remaining inspectors from Iran, following an ongoing impasse over access to Iranian nuclear facilities after military strikes by Israel and the United States. Iran has passed legislation to suspend cooperation with the agency, and there is no clarity on when inspections might resume.

About IAEA:

- The **International Atomic Energy Agency (IAEA)** is an autonomous international organization within the **United Nations system**, established in **1957**, and headquartered in **Vienna, Austria**.
- Its primary mandate is to **promote the peaceful use of nuclear energy** and to **prevent its use for military purposes**, including nuclear weapons.

IAEA and Iran:

- Iran is a **signatory to the Nuclear Non-Proliferation Treaty (NPT)** and hence subject to IAEA safeguards.
- The **Joint Comprehensive Plan of Action (JCPOA)**, signed in 2015 between Iran and P5+1 countries, was monitored by the IAEA for compliance.
- Following U.S. withdrawal from JCPOA in 2018, Iran began scaling back its commitments, leading to tensions and reduced IAEA access.

Current Crisis (July 2025):

- After **Israel and the U.S. launched strikes** on Iran's nuclear sites amid ongoing conflict, Iran **passed a law suspending cooperation** with the IAEA.
- The IAEA has had **no inspections since the war began**, and Iran's **near weapons-grade uranium stockpile remains unaccounted for**.
- IAEA Director has called this lack of access a major concern, jeopardizing **non-proliferation objectives**.

Implications for Global Security:

- Undermines **transparency and verification** of Iran's nuclear program.
- Raises **proliferation risks** in West Asia (Middle East).
- May affect **global oil prices and geopolitical stability**, given Iran's strategic position and the international concern around nuclear weaponization.

ANTI-DUMPING DUTIES

CONTEXT

China has announced anti-dumping duties ranging from 27.7% to 34.9% on European brandy imports, particularly French cognac. These duties, effective for five years starting July 6, 2025, were introduced following an investigation into unfair trade practices, and are seen as a response to the European Union's probe into Chinese electric vehicle (EV) subsidies.

1. What is Anti-Dumping Duty?

- An anti-dumping duty is a **trade protection measure** imposed by a country to protect its domestic industry from **foreign imports priced below fair market value**.
- **It is permitted under the World Trade Organization (WTO) framework, specifically the Agreement on Implementation of Article VI of GATT 1994 (Anti-Dumping Agreement).**

China-EU Trade Tensions:

- The anti-dumping duties follow the EU's investigation into **subsidies for Chinese EV manufacturers**, hinting at **escalating trade disputes** between China and Western economies.
- China has responded with **reciprocal investigations** and now, duties on EU goods—indicative of growing economic retaliation.

Implications for India:

- India, as a WTO member and active trade participant, frequently uses **anti-dumping measures** through the Directorate General of Trade Remedies (DGTR).
- Monitoring global trade tensions helps assess **spillover effects on Indian exports**, global supply chains, and **India-EU or India-China trade strategies**.

INDIA'S STRATEGIC ENGAGEMENT IN CRITICAL MINERALS CLUBS

CONTEXT

The Quad foreign ministers (India, US, Australia, and Japan) launched the Critical Minerals Initiative to collectively secure and diversify global supply chains, positioning India's participation in "mineral clubs" as a key element of its minerals diplomacy amid rising geopolitical and economic challenges.

Critical Minerals

- Critical minerals are those that are economically important, strategically essential, and have a high risk of supply disruption.
- They are crucial for advanced technologies, clean energy transitions, national defense, electronics, aerospace, and semiconductors.
- **Examples:** Lithium, Cobalt, Nickel, Graphite, Rare Earth Elements (REEs), Titanium, Tungsten, Vanadium, Platinum Group Metals, etc.

Why Are They "Critical"?

- **Economic and Strategic Dependence**: Key for manufacturing electric vehicles, solar panels, wind turbines, batteries, missiles, and drones.

Geographic Concentration of Supply:

- China dominates rare earth processing (>85%).
- Congo controls 70% of cobalt production.
- Australia, Chile, and Argentina lead lithium production.

Supply Chain Vulnerabilities:

- Geo-political tensions, export restrictions, or internal instability in mineral-rich nations can disrupt supply.

Significance of Critical Minerals for India:

- Critical minerals (like lithium, cobalt, rare earths, nickel, graphite) are vital for India's clean energy transition, supporting sectors such as **electric mobility**, **solar energy**, **battery storage**, **semiconductors**, and **advanced manufacturing**.
- India is heavily dependent on **China for rare earths** and lacks advanced domestic extraction and processing technologies.

India's Multilateral Strategy in Mineral Diplomacy:

- India is part of groupings like the Minerals Security Partnership (MSP) and now the Quad Critical Minerals Initiative to strengthen access to reliable and diversified supply chains.
- Such "mineral clubs" facilitate joint R&D, co-financing, technology sharing, and resource security through friendly stockpiling and de-risking mechanisms.

Strategic Challenges and Safeguards:

- India must avoid being reduced to a low-end processing hub or transit country while high-value components remain with developed nations.
- India should negotiate for technology transfer, IPR access, ESG standard shaping, and inclusive developmental benefits for the Global South.
- Need for policy alignment with domestic goals like Atmanirbhar Bharat and Make in India, alongside global ESG compliance.

National Critical Mineral Mission (NCMM)

Background & Context

- India is highly import-dependent for several **critical and strategic minerals** like **Lithium**, **Cobalt**, **Nickel**, and **Rare Earth Elements (REEs)**.
- To meet the clean energy goals under **Net Zero by 2070**, and to support **Make in India** and **Atmanirbhar Bharat**, the NCMM aims to develop a **resilient, domestic mineral value chain**.

Objective of NCMM

- Ensure **self-reliance** in the supply of **critical minerals** vital for:
  - **High-tech manufacturing** (EVs, semiconductors)
  - **Clean energy technologies** (solar panels, wind turbines, batteries)
  - **National defense and aerospace systems**
- Minimize supply chain risks by **reducing import dependence** and promoting domestic capacity.
- Promote **urban mining and recycling** through sustainable recovery methods.

Comprehensive Scope

- **Entire Lifecycle Coverage**:
  - **Exploration**, **Mining**, **Beneficiation**, **Processing**, **Recycling**, and **Recovery** from end-of-life products.

- Expansion to **offshore mineral resources** and **deep-sea mining** potential.

Key Strategies

- **Whole-of-Government Approach**: Synergized coordination between **Ministries**, **PSUs**, **Private Sector**, **Research Bodies**, and **State Governments**.
- **Fast-Track Clearances**: Single-window approval mechanisms to speed up **critical mineral projects**.
- **Mineral Stockpiling**: Strategic reserves to **mitigate future disruptions** and **price volatility**.

Infrastructure Development

- Establish **Critical Mineral Processing Parks** with shared facilities for **refining**, **alloying**, and **component manufacturing**.
- Launch of **Centre of Excellence for Critical Minerals** to support R&D.

Incentives & Innovation Promotion

- Financial incentives for private industries to establish **processing units** in India.
- Expand **PRISM (Promoting Innovations in Individuals, Startups and MSMEs)**:
  - Fund startups and MSMEs working on critical mineral technologies.
- Support **academic-industry collaboration** and **international technology transfers**.

WORLD BANK GINI INDEX 2023

CONTEXT

According to the World Bank's latest inequality assessment (2023), India has witnessed a substantial decline in inequality and extreme poverty between 2011–12 and 2022–23. With a Gini Index score of 25.5, India is now ranked 4th most equal country globally, behind the Slovak Republic, Slovenia, and Belarus.

Gini Index – Concept and India's Performance:

- The **Gini Index** (or Gini coefficient) measures income, wealth, or consumption inequality.
- It ranges from **0 (perfect equality)** to **100 (perfect inequality)**.
- **India's Gini Index in 2022–23 is 25.5**, placing it in the **"moderately low inequality" category** (Gini score between 25 and 30).
- India now ranks **better than major economies like China (35.7)** and the **USA (41.8)** in income equality.

Trends in Poverty Reduction:

- **Extreme poverty** in India has declined from **16.2% (2011–12)** to **2.3% (2022–23)**.
- This improvement aligns with broader **inclusive development efforts** and targeted social welfare schemes.

Policy Attributions and Global Rankings:

- The Indian government attributes this progress to multiple **flagship welfare schemes**, including DBT (Direct Benefit Transfers), PM-GKY, PM-Awas Yojana, Ujjwala, and Jan Dhan Yojana.
- The **top three countries in equality** according to the World Bank's 2023 Gini Index:
  - Slovak Republic
  - Slovenia
  - Belarus
  - India

FOREST RIGHTS ACT,2006

CONTEXT

The Ministry of Tribal Affairs has sought scientific evidence from the Environment Ministry for attributing forest cover loss in ISFR 2023 to the Forest Rights Act, warning that such unverified claims may undermine the Act's implementation.

Forest Rights Act, 2006 (FRA, 2006):

Overview and Purpose

- FRA, 2006 is also known as the **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act**.
- Aims to **correct historical injustice** done to forest-dwelling communities by recognizing their rights over forest land and resources.
- Enacted to **secure livelihoods**, ensure **tribal empowerment**, and promote **sustainable forest governance**.

Need for FRA

- **Tribal communities** have lived in and depended on forests for centuries.
- During **British rule**, they were alienated from their traditional habitats.
- Post-Independence policies continued to **exclude forest dwellers** from ownership and governance.
- Development projects often led to **displacement without recognition of rights**.
- FRA was enacted to:
  - Acknowledge traditional rights.
  - Provide legal security.
  - Ensure participatory forest conservation.

Objectives of FRA

- Empower and strengthen **local self-governance**.
- Address **livelihood security** and contribute to **poverty alleviation**.

- Promote **conservation and sustainable use** of forest resources.
- Democratize forest governance through **Gram Sabha** involvement.

Key Provisions of FRA

Types of Rights Recognized

- **Land Rights**:
  - Legal title for forest land cultivated before **13 December 2005**.
  - No documentary proof required for up to **4 hectares**, if used for subsistence.
- **Use Rights**:
  - Right to collect and use **Minor Forest Produce (MFP)** (e.g., herbs, tendu leaves, medicinal plants).
  - **Grazing rights** and access to water bodies.
  - Use of **traditional migration routes** by pastoralist communities.
- **Community Rights**:
  - Rights over **Nistar lands**, **community forest resources**, etc.
  - **Habitat rights** for PVTGs and pre-agricultural tribal groups.
- **Right to Protect and Conserve**:
  - Forest communities can **regenerate, conserve, and manage** their traditional forest resources.
- **Development Rights**:
  - Forest land diversion allowed for **public utilities** (schools, health centers, roads, etc.) with **Gram Sabha approval**.

Institutional Framework for Implementation

LEVEL	RESPONSIBILITY
Gram Sabha	Receives & verifies claims
Sub-Divisional Level Committee (SDLC)	Screens and forwards claims
District Level Committee (DLC)	Final decision on claims

Implementation Challenges

- **Low awareness** among forest dwellers about their rights.
- **Wrongful rejections** of claims due to poor verification.
- **Overlapping laws**: Conflicts with PESA Act, Indian Forest Act, JFM (Joint Forest Management).
- **Neglect of Community Rights**: Only ~4% of recognised titles are **community-based**.
- **Inadequate capacity** in MoTA (Ministry of Tribal Affairs) for monitoring implementation.
- **Inactive vigilance committees** at local levels.

Recent Developments:

- **ISFR 2023** linked negative forest cover change partly to **FRA implementation**.
- **Ministry of Tribal Affairs** questioned this claim, demanding **scientific validation** and expressing concern over potential **administrative bias**.
- Over **150 civil society groups** supported MoTA's objection, arguing that FRA enables **rights-based conservation** rather than degradation.

PYQ:

Q: Consider the following statements: (2019)

(1) As per recent amendment to the Indian Forest Act, 1927, forest dwellers have the right to fell the bamboos grown on forest areas.

(2) As per the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, bamboo is a minor forest produce.

(3) The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 allows ownership of minor forest produce to forest dwellers.

Which of the statements given above is/are correct?

(a) 1 and 2 only (b) 2 and 3 only

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

Q: If a particular area is brought under the Fifth Schedule of the Constitution of India, which one of the following statements best reflects the consequence of it? (2022)

(a) This would prevent the transfer of land of tribal people to non-tribal people.

(b) This would create a local self-governing body in that area.

(c) This would convert that area into a Union Territory.

(d) The State having such areas would be declared a Special Category State.

RARE COASTAL SIGHTING OF GREAT HORNBILL

CONTEXT

The Great Hornbill, Kerala's State Bird and typically a forest-dwelling species, was recently sighted in the coastal region of Kakkampara near Ezhimala in Kannur district — an unusual habitat for the species, raising ecological and conservation interest.

Species Overview:

- **Common Name:** Great Hornbill (Malamuzhakki Vezhambal)

- **Scientific Name:** *Buceros bicornis*
- **Conservation Status:**
  - **IUCN:** Endangered
  - **Indian Wildlife Protection Act, 1972:** Schedule I species (highest protection)

Typical Habitat and Distribution:

- Found in **evergreen and moist deciduous forests** across the Western Ghats and parts of Northeast India.
- Common in forest areas such as **Silent Valley, Nelliampathy, Aralam, Athirappilly**, and **Parambikulam**.
- Very rarely seen in coastal areas, making this sighting ecologically significant.

Ecological Significance:

- Great Hornbills are **indicator species**, reflecting the health of forest ecosystems.
- Their **diet of fruits** plays a crucial role in seed dispersal and forest regeneration.

Science and Technology

PALM OIL & HEALTH

CONTEXT

The Indian Food and Beverage Association (IFBA) has challenged negative claims about palm oil, calling labels like "palm oil free" misleading, thereby reigniting a science-based debate on its health impacts as per ICMR dietary guidelines.

Palm Oil and Health

Nutritional Composition of Palm Oil

- Palm oil contains approximately **40g of saturated fatty acids (SFA)** and **40g of mono-unsaturated fatty acids (MUFA)** per 100g.
- It is **semi-solid at room temperature** and does not require hydrogenation, hence contains negligible **trans fatty acids (TFA)**.
- Compared to coconut oil and ghee (which have ~90g and ~70g of SFA respectively), palm oil has relatively lower SFA content.

ICMR Guidelines on Edible Oils

- The **ICMR dietary guidelines** recommend limiting oil intake to **20–50 grams/day/person**, depending on physical activity levels.
- Oils high in **poly-unsaturated fatty acids (PUFA)** and low in SFA are preferred. Recommended alternatives include **mustard, sunflower, safflower oils**.
- Reheating oils, especially PUFA-rich oils, is discouraged due to **oxidation and formation of harmful compounds**.

Health Implications of Different Fats

- **SFA-rich oils** can increase **LDL cholesterol**, promoting inflammation and risk of **cardiovascular diseases and type-2 diabetes**.
- **Hydrogenated oils** (containing trans fats) are associated with **cancer risks**, **neurological disorders**, and **pregnancy complications**.
- Palm oil offers the benefit of **tocotrienols**, a form of Vitamin E that may help reduce cholesterol, but its SFA content necessitates **moderation**.

Palm Oil

- Palm oil is an edible vegetable oil extracted from the mesocarp (reddish pulp) of the fruit of oil palm trees (mainly *Elaeis guineensis*).
- **Forms & Uses:**
  - Found in processed foods, chocolates, biscuits, cosmetics, soaps, shampoos, detergents, and as a **biofuel** (crude palm oil in biodiesel = "green diesel").
  - Has a **neutral taste**, long shelf life, and stable cooking properties.

Global Production & Trade

- **Native Origin:** Africa (particularly West Africa).
- **Top Producers:**
  - **Indonesia** – Largest global producer.
  - **Malaysia** – Second-largest.
  - **Together** they account for **~85% of global palm oil supply**.

India's Position

- India = Largest importer of palm oil globally.
  - Imports over 8.3 million tonnes annually.
  - 40% of India's vegetable oil consumption comes from palm oil.
- **Key Suppliers:** Indonesia supplies nearly half of India's annual palm oil needs.
- **Leading States in India:** Andhra Pradesh (Largest contributor), Telangana, Kerala
- **National Mission on Edible Oil – Oil Palm (NMEO-OP):**
  - Launched in **2021**.
  - **Goal:** Boost domestic cultivation and reduce import dependency.
  - **Focus areas**: **North-East India & Andaman and Nicobar Islands** (favorable climate).
  - Includes financial assistance for planting material, irrigation, and oil palm processing units.

NIPAH VIRUS RESURFACES IN KERALA

CONTEXT

In July 2025, Kerala reported fresh cases of Nipah virus infection in Kozhikode, Malappuram, and Palakkad districts, with one confirmed fatality and two other confirmed cases under treatment. The National Institute of Virology (NIV), Pune, has validated the diagnosis, prompting the Kerala government to initiate strict containment measures and surveillance, with 345 individuals placed under observation.

What is Nipah Virus (NiV)?

- Nipah virus is a **zoonotic paramyxovirus from the genus *Henipavirus***, known to cause severe acute encephalitis and respiratory illnesses in humans.
- First **identified in Malaysia in 1998**, with pigs as intermediate hosts. In India, outbreaks have been recorded in West Bengal (2001, 2007) and Kerala (2018, 2021, 2023, 2025).
- The virus has a case fatality rate ranging from 40% to 75%, as per WHO estimates.

Modes of Transmission and Symptoms:

Transmission occurs via:

- **Direct contact** with infected bats, pigs, or humans
- Consumption of **contaminated date palm sap** or fruits
- **Human-to-human transmission**, especially among healthcare workers or caregivers

- **Symptoms:** Fever, headache, drowsiness, confusion, seizures, and encephalitis. Respiratory distress is also common in some outbreaks.

Government Response and Preparedness:

- **Contact tracing and route mapping** of infected individuals have been initiated in affected districts.
- **Quarantine of healthcare workers** who treated confirmed cases and post-mortem teams has been implemented.
- **Kerala Health Department** has placed **Kozhikode, Palakkad, and Malappuram** under enhanced surveillance and **isolation protocols**.
- NiV is a **Category A pathogen** as per CDC, warranting **BSL-4 (Biosafety Level-4) lab handling** for research and diagnostics.

MATRILINEAL CLANS IN NEOLITHIC CHINA

Context

New archaeological evidence from two Neolithic cemeteries (4,750–4,500 years ago) on China's eastern coast reveals that ancient communities may have practiced matrilineal kinship.

Key Findings

Genetic Evidence:

mtDNA (mitochondrial DNA):

- Inherited **only from mothers**.
- Uniform mtDNA across individuals within each cemetery indicated **common maternal ancestry**.
- Different mtDNA between cemeteries confirmed distinct **matrilineal clans**.

Y-chromosome DNA:

- Inherited **only from fathers to sons**.
- Y-DNA was **highly diverse**, indicating **non-paternal lineage** focus in burial practices.

Isotopic Evidence:

- **Strontium isotope ratios ($^{87}Sr/^{86}Sr$)**:
  - Found in teeth and bones; matched with local soils → **individuals were non-migratory**.
- **Carbon isotope ratios ($^{13}C/^{12}C$)**:
  - Diet was primarily **millet-based agriculture**, with **pig domestication**.
  - **No dietary distinction** between males and females → **equal food access**.

Significance

- **Contradicts the assumption** that ancient societies were exclusively patriarchal.
- Provides **rare concrete evidence** of **matrilineal social organization** in prehistoric times.
- Demonstrates the role of **DNA and isotope analysis** in reconstructing ancient **social, dietary, and migratory patterns**.

Examples of Other Matrilineal Societies:

- **Chaco Canyon Civilization**, North America (800–1300 BCE)
- **Certain Celtic Communities**, Germany (616–200 BCE)

FIFTH GENERATION AIRCRAFT

Context:

A British F-35B stealth fighter jet from the UK's Carrier Strike Group made an emergency landing in Kerala due to a technical malfunction and is being repaired with support from Indian authorities.

5th-Generation Fighter Jet:

- Fifth-generation (5G) fighter jets are advanced combat aircraft designed for air superiority and strike roles in highly contested environments. They are built with stealth, advanced avionics, and multirole versatility.

Key Capabilities:

- **Stealth Design:** Multi-spectral low observability to avoid radar, infrared, and visual detection.
- **Supercruise:** Ability to fly at supersonic speeds without afterburners.
- **Sensor Fusion:** Integrated sensors and data fusion for real-time battlefield awareness.
  - **Network-Centric Warfare:** High interoperability with other platforms (land, sea, air, and space).
  - **Electronic Warfare:** Equipped with radar jamming, self-protection, and decoy capabilities.
  - **Advanced Weapons Integration:** Internal weapons bays for reduced radar signature.

Current Global Operators:

F-22 Raptor (USA)

- **Role**: Air Superiority Fighter
- **Developer**: Lockheed Martin for the U.S. Air Force
- **Key Features**:
  - First operational 5th-generation stealth fighter.
  - Prioritizes stealth, supercruise, advanced avionics, and agility.
  - Highly maneuverable with thrust-vectoring nozzles.

F-35 Lightning II (USA)

- **Role**: Multirole Stealth Fighter
- **Developer**: Lockheed Martin for U.S. and allied forces
- **Variants**:
  - **F-35A** – Conventional takeoff and landing (CTOL) for the U.S. Air Force.
  - **F-35B** – Short takeoff/vertical landing (STOVL) for the U.S. Marine Corps.
  - **F-35C** – Carrier-based variant for the U.S. Navy.
- **Key Features:**
  - Stealth, advanced data fusion, sensor integration, and network-centric warfare capabilities.
  - Extensive global user base including NATO allies and partners like Japan, Australia, and Israel.

Sukhoi Su-57 (Russia)

- **Role**: Multirole Stealth Fighter (Air superiority + Ground attack)
- **Developer**: Sukhoi, under United Aircraft Corporation
- **Key Features**:
  - Stealthy design with super-maneuverability and advanced avionics.
  - Equipped with radar-absorbing materials and internal weapon bays.
  - Emphasis on agility using thrust-vectoring engines.

KF-21 Boramae (South Korea)

- **Role**: Multirole Fighter (4.5 to 5th-generation hybrid)
- **Developer**: Korea Aerospace Industries (KAI), in partnership with Indonesia
- **Key Features**:
  - Incorporates stealth shaping, AESA radar, and internal weapon integration in later phases.
  - Intended as a cost-effective alternative to F-35 with scalable upgrades.
  - Future variants expected to evolve into full 5th-gen status.

HAL AMCA (India)

- **Role**: 5th-Generation Stealth Multirole Fighter (Under development)
- **Developer**: Hindustan Aeronautics Limited (HAL) and Defence Research and Development Organisation (DRDO)
- **Key Features**:
  - Designed with stealth shaping, internal weapon bays, supercruise capability, and AI-assisted avionics.
  - Targeted to achieve both air superiority and deep-strike capabilities.
  - May integrate 6th-gen features in later Mk2 versions (e.g., directed energy weapons, manned-unmanned teaming).

Strategic Need for India

IAF Fighter Strength:

- India currently operates ~30 fighter squadrons, short of the sanctioned strength of 42.
- The phasing out of legacy platforms like MiG-21s, MiG-29s, Jaguars, and Mirage 2000s necessitates rapid modernization.

Regional Security Context:

- **China:** Operates over 3,300 aircraft, including 5G platforms like J-20.
- **Pakistan**: Operates around 1,430 aircraft, with close military ties with China.
- **India:** Operates about 2,300 aircraft, but many are older-generation fighters.

Operational Urgency:

- With two hostile fronts (China and Pakistan), India requires enhanced air power with stealth, long-range strike, and survivability features.
- Indigenous development of 5G aircraft enhances strategic autonomy and reduces reliance on foreign imports.

CRISPR-EDITED RICE

CONTEXT

Researchers at the National Institute of Plant Genome Research (NIPGR) have successfully used CRISPR-Cas9 gene editing to enhance phosphate uptake and transport in japonica rice by modifying a phosphate transporter gene (OsPHO1;2), potentially reducing fertilizer use and increasing crop yield.

CRISPR-Cas9 Technology in Agriculture:

- CRISPR-Cas9 is a **precision gene-editing tool** derived from *Streptococcus pyogenes*, enabling targeted modification of DNA without introducing foreign genes.
- NIPGR researchers used CRISPR-Cas9 to **knock out a 30-base pair binding site** of a repressor gene (OsWRKY6), enhancing expression of the **phosphate transporter OsPHO1;2** in rice.
- This **increased phosphate translocation** from root to shoot, boosting yield **without altering seed quality**.

Impact on Fertilizer Use and Yield:

Gene-edited lines showed:

- **20% yield increase** at standard phosphate fertilizer doses.
- **40% yield increase** even with just 10% of the recommended phosphate dose.

- This helps address the issue of **low phosphorus use efficiency**, as typically only 15–20% of applied phosphate is absorbed by plants.

India's Fertilizer Dependency:

- India is **heavily dependent on imports** for phosphate fertilizers.
- Developing indigenous high-efficiency varieties can promote **nutrient use efficiency** and reduce environmental runoff.

Regulatory and Biosafety Aspects:

- Concerns around **off-target effects** and **foreign DNA integration** are being addressed:
  - Off-target edits were tested with in-silico tools—no unintended mutations were detected.
  - Foreign bacterial DNA (e.g., Cas9 and vector DNA from *Agrobacterium tumefaciens*) is removed via **Mendelian segregation** in subsequent generations.

Scientific Significance:

- Marks **India's leadership in plant gene editing**, particularly in rice.
- If extended to **indica rice cultivars**, it may revolutionise phosphate management in Indian agriculture, where phosphorus deficiency is common in alkaline and acidic soils.

700 MWE PHWRS AT KAKRAPAR

CONTEXT

India's nuclear energy programme achieved a key milestone as the AERB granted a five-year operational licence to NPCIL for Units 3 and 4 of Kakrapar Atomic Power Station—India's first indigenously developed 700 MWe PHWRs.

Pressurised Heavy Water Reactor (PHWR)

- A Pressurised Heavy Water Reactor (PHWR) is a nuclear reactor using **natural uranium** as fuel and **heavy water (D_2O)** as both **moderator** and **coolant**.
- **Heavy Water Role**: Deuterium (^2H) in heavy water slows down neutrons without absorbing them—essential for fission in natural uranium.

Key Technical Features

- **Fuel**: Natural uranium (U-238 and U-235); does not require enrichment.
- **Moderator/Coolant**: Heavy water (D_2O) used for both neutron moderation and heat transfer.
- **Design**: Based on **pressure tubes** instead of a large pressure vessel (used in LWRs).
- **Heat Transfer Mechanism**: Fission heat is transferred to a secondary loop to generate steam and drive turbines.

Working Principle

- **Chain Reaction**: Neutrons are slowed by heavy water, enabling sustained fission in U-235.
- **Heat Generation**: Resultant heat is absorbed by circulating heavy water.
- **Electricity Production**: Heat is exchanged in a secondary circuit to produce steam for turbine-driven electricity generation.

Advantages of PHWRs

- **Use of Natural Uranium**: Avoids costs and logistics of uranium enrichment.
- **Online Refueling Capability**: Can be refueled without shutdown, increasing reactor uptime.
- **Fuel Versatility**: Can operate using MOX fuel or **thorium**, supporting India's thorium-based energy roadmap.
- **Economical Long-Term**: Though heavy water is expensive, low fuel costs and efficient operation make it cost-effective over time.

Disadvantages

- **Heavy Water Cost**: High cost for production, storage, and maintenance.
- **Design Complexity**: Pressure tubes are prone to **stress corrosion**, requiring periodic inspection and replacement.

- **Safety Challenges**: Although robust, pressure tube rupture poses a safety concern if not properly managed.

Global Deployment

- **India**: Global leader in indigenous PHWR technology (e.g., **Kakrapar 700 MWe reactors**).
- **Canada**: Developer of the **CANDU** (CANada Deuterium Uranium) PHWR design.
- **Other Countries**: PHWR/CANDU variants used by **Argentina**, **China**, and **South Korea**.

Atomic Energy Regulatory Board (AERB):

Establishment & Legal Basis

- **Established**: 15 November 1983.
- **Under**: Atomic Energy Act, 1962.
- Constituted by the Government of India to carry out regulatory and safety functions in the nuclear energy sector.
- **Administrative Control**: Operates under the aegis of the **Department of Atomic Energy (DAE)**, but functions independently in regulatory matters.

Mandate and Functions

- **Safety Oversight**: Regulates the use of ionising radiation and nuclear energy for civilian applications.
- **Licensing Authority**: Grants licenses for siting, construction, operation, and decommissioning of nuclear and radiation facilities in India.
- **Enforcement Power**: Has authority to enforce compliance with safety standards and shut down facilities in case of violations.

Scope of Regulatory Activities

- **Nuclear Power Plants** (NPPs): Safety regulation of design, construction, commissioning, and operation.
- **Radiation Facilities**: Medical, industrial, and research usage of radiation sources (like X-ray units, cobalt therapy units).
- **Radiation Waste Management**: Ensures safe disposal and containment of radioactive waste.
- **Transportation of Radioactive Material**: Regulates packaging, transport, and handling of radioactive substances.

Organisational Structure

- **Chairperson**: Appointed by the Government of India.
- **Committees and Advisory Bodies**:
  - **Safety Review Committee for Operating Plants (SARCOP)**
  - **Advisory Committee on Project Safety Review (ACPSR)**
  - **Radiological Safety Advisory Committee (RSAC)**
  -
- These bodies support AERB with expert reviews and audits.

Safety Code:

- **Safety Codes**: Formulates and enforces safety codes, standards, and guidelines.
- **International Coordination**:
  - Collaborates with **IAEA (International Atomic Energy Agency)**.
  - Participates in global nuclear safety conventions like the **Convention on Nuclear Safety (CNS)**.
  - Aligns Indian safety protocols with international best practices.

CATASTROPHE BONDS

CONTEXT

Amid rising climate-induced disasters and economic losses, Catastrophe Bonds (Cat Bonds) are gaining attention as innovative financial instruments, prompting discussions on India's potential role in sponsoring them for disaster risk transfer and post-disaster recovery financing.

What are Catastrophe Bonds (Cat Bonds)?

- Cat Bonds are **insurance-linked securities (ILS)** that allow countries or insurers to transfer **catastrophic risk to capital markets**.
- They function as **high-yield debt instruments**, where the investor may lose principal if a predefined disaster (like an earthquake or cyclone) occurs.
- Typically issued by a **sovereign government** through intermediaries (e.g., **World Bank, ADB, reinsurance firms**).
- The **premium (coupon)** paid is higher due to the high-risk nature of these bonds.

Global Adoption and Relevance:

- Initiated in the **late 1990s**, post-Hurricane Andrew in the U.S., when reinsurance capacity became insufficient.
- Over **$180 billion** in issuances globally; ~**$50 billion** currently outstanding.
- Popular with **pension funds** and **hedge funds** for **portfolio diversification**, as natural hazard risks are **non-correlated with financial markets**.

Need and Scope for India:

- India faces high disaster vulnerability: cyclones, earthquakes, floods, and wildfires.
- Rising **climate-linked disaster frequency and severity** raises risks to public finance and recovery efforts.

- India's **credit rating** and **$1.8 billion/annum allocation** for disaster risk reduction since FY21-22 strengthens the case for sponsoring cat bonds.
- India can lead a **South Asian Cat Bond** for regional risk pooling (e.g., earthquakes in Nepal/Bhutan/India, cyclones in Bay of Bengal).

Disadvantages and Precautions:

- **Trigger design flaws** (e.g., magnitude 6.6 threshold when a 6.5 earthquake causes damage) may **prevent payouts**.
- Non-occurrence of disaster may raise questions over **cost-effectiveness**.
- Transparent cost-benefit assessments comparing **premiums paid** vs **historic post-disaster recovery costs** are essential.

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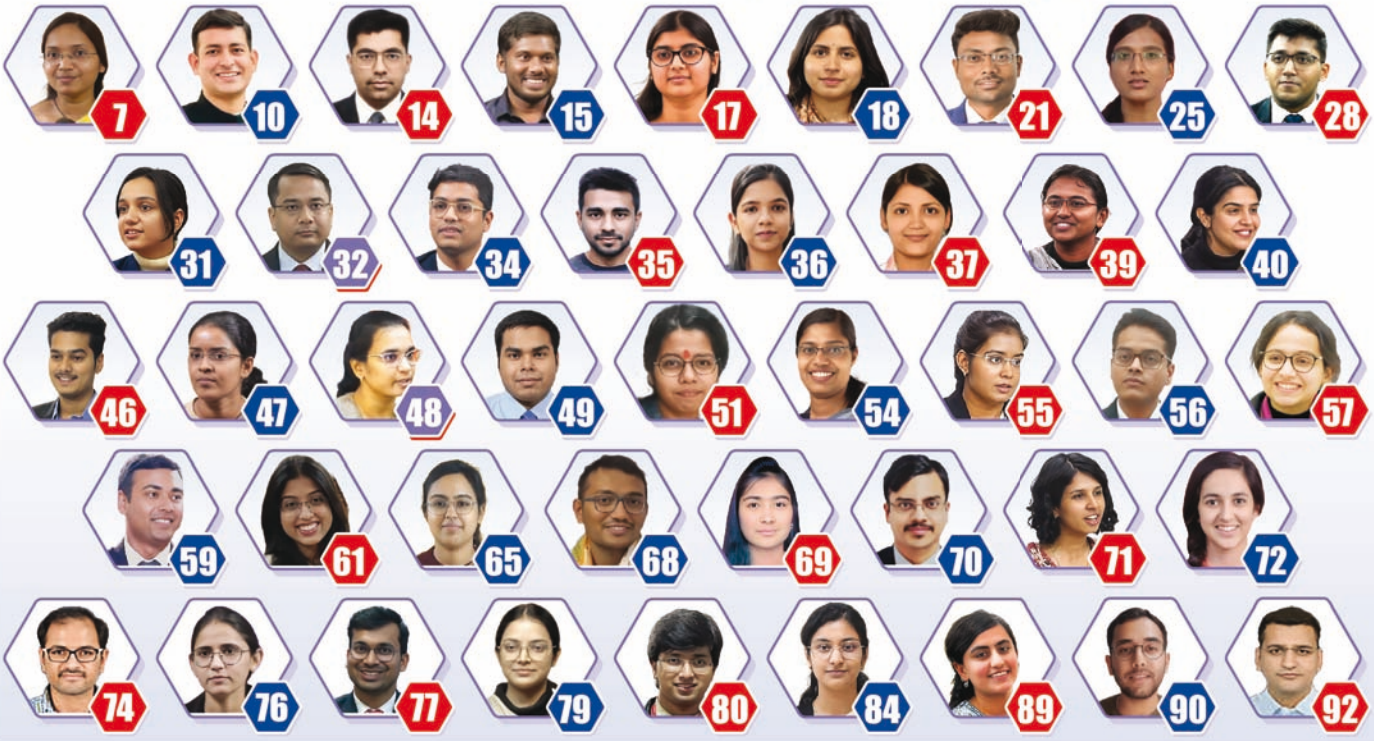

TOP 100 ALL INDIA RANKING CSE 2023

TOP 100 ALL INDIA RANKING CSE 2022

2nd Floor, Metro Tower, 1B, Pusa Road, Karol Bagh,
New Delhi - 110005 (Beside Karol Bagh Metro Station Gate No. 8)

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