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JULY, 2025

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DISCLAIMER

*T*he 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

4th WEEK - JULY, 2025

SECTION -A

MAINS ISSUES

HUMAN-INDUCED EARTHQUAKES

Context:

Recent studies and seismic data have highlighted the increasing frequency of human-induced earthquakes in India, with significant linkages to groundwater extraction, reservoir loading, and infrastructural activities in seismically vulnerable regions.

Rising Anthropogenic Activities and Seismic Vulnerability: A Case Study of Human-Induced Earthquakes in India

- **Understanding Human-Induced Earthquakes**

  - **Definition and Global Context:** Human-induced earthquakes (HIEs) are seismic events triggered by anthropogenic activities. As per *Seismological Research Letters (2017)*, over **700 such events have occurred globally in the last 150 years**.

  - **Mechanism:** Activities such as mining, fluid injection, dam construction, and groundwater depletion alter the stress balance along fault lines, potentially triggering seismic events.

- **India-Specific Observations**

  - **Delhi-NCR and Groundwater Depletion:** A *2021 study* in *Scientific Reports* linked **shallow earthquakes in Delhi-NCR** to **groundwater extraction** between 2003–2012. Seismic activity decreased post-2014 when the water table stabilized.

  - **Koyna Earthquake (1967):** A **6.3 magnitude quake**, caused by water impoundment in the Koyna dam, killed over 180 people and destroyed thousands of houses. This was one of the earliest confirmed instances of a reservoir-induced earthquake (RIE) in India.

  - **Other Vulnerable Zones:**
    - Mullaperiyar Dam (Kerala)
    - Palghar district (Maharashtra)
    - Sahyadri Range (Western Ghats) – showing signs of seismicity induced by extreme rainfall.

- **Anthropogenic Triggers of Earthquakes**

  - **Groundwater Extraction:**
    - Depletes sub-surface pressure balance.
    - Increases vertical stress and may activate dormant fault lines.

  - **Reservoir-Induced Seismicity (RIS):**
    - Caused by loading and percolation of water in faulted rock zones.
    - Risk aggravated in tectonically active areas like the Himalayas.

  - **Fracking and Energy Extraction:**
    - India has 56 fracking sites across six states.
    - Injection of fluid causes fissures and displacement, triggering seismic events.

  - **Construction of Tall Infrastructure:**
    - Concentrated loading in high-rise cities in seismically active zones, e.g., Delhi, increases vulnerability.

Impact of Climate Change on Seismicity

- **Glacial Melting:** Observed in Antarctica and Greenland; loss of mass alters stress distribution along tectonic plates.
- **Rainfall Variability:** Sudden, intense rainfall alters surface pressure and water loading—evident in the Sahyadris.
- **Drought and Seismic Reactivation:** 2014 California quake attributed to prolonged drought-induced fault reactivation.

Scientific and Policy Recommendations:

- **Scientific Monitoring:**
  - Expand seismic networks across fault-prone regions.
  - Real-time monitoring systems to track fluid migration and stress changes.
- **Regulatory Reforms:**
  - Enforce controlled dam-filling/emptying protocols, as done in the U.S.
  - Limit fracking and energy projects in seismic zones.
- **Groundwater Governance:**
  - Encourage rainwater harvesting and managed aquifer recharge.
  - Integrate **hydrogeology with urban planning** and cropping patterns.
- **Environmental Impact Assessment (EIA) Reforms:**
  - Mandatory seismic risk assessment for large infrastructure projects.
  - Incorporate **climate-induced seismic risk metrics** in EIA reports.

FIVE YEARS OF NATIONAL EDUCATION POLICY (NEP) 2020

Context:

The Government of India has completed five years of implementation of the National Education Policy 2020, marking substantial progress in curriculum reforms, digital integration, teacher training, and equitable access to quality education.

Historical Context and Rationale

- **Legacy of Colonial System**: The British education model was designed to create clerks, not innovators. It was **job-centric and not skill-oriented**.
- **Need for Reform**: Post-independence, minor changes were made, but a **comprehensive restructuring was missing**.

- **NEP 2020** was envisioned to address these systemic gaps and align Indian education with 21st-century needs.

Vision and Objectives of NEP 2020

- **Practical & Skill-based Education:** Move away from rote learning.
- **Holistic Development:** Build value-based, tech-savvy, and globally competitive citizens.
- **Inclusive Access:** Bridge rural-urban, gender, and socio-economic divides.
- **Public Investment Target**: Increase spending to 6% of GDP.

School Education Reforms

Structural Reform: 5+3+3+4 Curriculum

- Foundation: 3–8 years
- Preparatory: 8–11 years
- Middle: 11–14 years
- Secondary: 14–18 years

Curriculum and Pedagogy Modernization

- NCERT's National Curriculum Framework introduced.
- Bal Vatika, Vidya Pravesh, and Jaadui Pitara for early childhood care.
- CBSE introduced subjects like AI, Design Thinking, Data Science.
- Syllabus reduction to reduce student burden.

Assessment Reform

- CBSE Class 10 board exams to be conducted twice a year from 2026.
- Introduction of formative assessments and internal assessments.

Skill Development in Schools

- **Skill modules** introduced in Classes 9–12.
- 138 skill job roles approved till 2025.
- **Vocational education** expanded: From 1,850 (2014–15) to 29,342 schools (2024–25).

Higher Education Reforms

Curriculum and Credit Reforms

- National Higher Education Qualification Framework (NHEQF)
- Multiple Entry-Exit System, Academic Bank of Credits
- PM Vidya Lakshmi for financial aid
  - 40% credit transfer through SWAYAM
- Institutional Expansion
- 7 new IITs, 8 IIMs, 13 AIIMS, 354 Eklavya Schools

- MBBS seats nearly **doubled** in a decade
  - *2014*: 54,348 seats | *2025*: 1,18,190 seats
- **Digital Education Ecosystem**
  - Diksha, Swayam Prabha, PM e-Vidya, e-Pathshala
  - Content in 126 Indian and 7 foreign languages
  - Over 25,000 hours of broadcast in 29 languages
- **Teacher Training and Governance**
  - **NISHTHA 3.0** for teacher training
  - Over **1.26 lakh master trainers** trained
  - **SAMARTH**: Digital governance for Higher Education Institutions (HEIs)

Foundational Literacy and Numeracy

- **NIPUN Bharat**: Basic literacy and numeracy by Class 2
- Integrated with **Samagra Shiksha 2.0** (till 2025–26)

Global Recognition and Rankings

QS World University Rankings (2026):

- Indian institutions included: 54 (2015: only 11)
- 8 new Indian universities entered for the first time
- IIT Delhi ranked 123rd globally

Challenges

- Implementation gaps at state level
- Digital divide in rural and tribal regions
- Teacher shortages and uneven quality of training
- Alignment of voctional education with employability

Way Forward

- Strengthen decentralised capacity-building at the state and district levels
- Foster public-private partnerships for infrastructure and skilling
- Ensure inclusivity for differently-abled and disadvantaged groups
- Establish strong monitoring and feedback mechanisms
- Promote research and innovation through increased funding and autonomy to institutions

INDIA'S STRATEGIC DILEMMA IN A MULTIPOLAR WORLD

Context:

The renewed threat of conflict between the United States, Israel, and Iran underlines the risks of instability in West Asia, posing direct strategic and economic challenges for India.

India's Foreign Policy, Multipolarity, and Regional Security Interests

Strategic Risks from a Possible Iran Regime Collapse

- **Unipolar Consolidation in West Asia:** A regime change in Iran could entrench U.S.-led unipolarity in the region, eliminating independent regional powers that counterbalance American influence. This would hinder India's aspiration to expand its strategic autonomy in West Asia.
- **Weakening of India's Balancing Diplomacy:** India's diplomatic leverage with Israel and Gulf nations is premised on its ability to simultaneously engage with Iran and Syria. The fall of Iran would strip Delhi of this balancing capability.
- **Energy Security Implications:** India imports over 80% of its crude oil, with Iran historically being a reliable supplier. A post-Iran scenario dominated by U.S.-aligned oil regimes would undermine India's energy diversification strategy.

Clash of Global Visions: Multipolarity vs. Unipolarity

- **India's Commitment to Multipolarity:** India's External Affairs Minister has openly advocated a multipolar world order. This is at odds with the West's preference for a U.S.-centric global hierarchy and reveals deeper geopolitical contradictions between Delhi and Washington.
- **Strategic Autonomy in Action:** India's refusal to isolate Russia following the Ukraine war, commissioning of Russian-made warships, and purchase of discounted Russian oil illustrate its steadfast pursuit of autonomy in global affairs.
- **Perception Gap with the West:** Western corporate and strategic establishments increasingly perceive India as drifting from their strategic orbit, especially as India finds itself ideologically and pragmatically closer to Russia and China on multipolarity.

Policy Options and Diplomatic Pathways for India

- **Advocating Restraint:** India can use its strategic capital with the U.S. to urge non-intervention in Iran, highlighting the adverse impact such a war would have on Asian powers — particularly India and China.
- **Strategic Leveraging of Quid Pro Quo:** India's neutral positioning, as seen during the Russia-Ukraine war, indicates that its cooperation cannot be assumed. India can use this to negotiate restraint in West Asia in return for quiet diplomatic support elsewhere.
- **Recalibrating the West's Global Vision:** India should encourage the U.S. to accept a more distributed global power structure as a preferable alternative to endless conflict or the rise of exclusive Chinese regional dominance.

Way Forward:

- **Assert Strategic Autonomy** – Continue India's policy of multi-alignment, resisting pressure to isolate countries like Iran and Russia.

◉ **Strengthen Regional Engagements** – Deepen ties with regional actors including Central Asia, Gulf states, and Southeast Asia to mitigate over-dependence on West Asia.

◉ **Invest in Indigenous Energy and Security Capabilities** – Develop domestic energy alternatives and strategic deterrents to withstand geopolitical shocks.

◉ **Engage in Quiet Diplomacy** – Use backchannel talks with the U.S. and EU to build a consensus around the necessity of multipolarity and regional stability.

PYQ:

Q: Discuss India's policy of strategic autonomy in the context of changing dynamics of global geopolitics, particularly with reference to the Russia-Ukraine conflict. **(2023)**

Q: "Multipolarity in the international system is an idea whose time has come." Critically examine in light of India's foreign policy objectives. **(2020)**

INDIA ACHIEVES E20 PETROL TARGET AHEAD OF DEADLINE

Context:

India has achieved 20% ethanol blending in petrol (E20) by 2025, five years ahead of the original 2030 target, prompting discussions on moving towards E27 and E85 grades and corresponding policy and automotive adaptations.

Ethanol Blending Programme (EBP):

◉ Ethanol blending involves mixing ethanol, a biofuel primarily derived from sugarcane or biomass, with petrol.

◉ The **National Policy on Biofuels (2018)** had set a target of 20% ethanol blending by 2030. India has now achieved this target by **2025**, significantly ahead of schedule.

Grades of Blending:

◉ **E20**: 20% ethanol + 80% petrol – now commercially implemented across India.

◉ **E27**: Proposed to be introduced by 2030.

◉ **E85**: High-blend ethanol fuel (85% ethanol) for **flex-fuel vehicles** – Government has notified draft rules for manufacturing such vehicles.

Automotive and Fuel Compatibility:

◉ Older vehicles may not be compatible with E20 or higher blends.

◉ **Society of Indian Automobile Manufacturers (SIAM)** has indicated readiness with engine modifications.

◉ Companies like Maruti Suzuki, Hyundai, Tata Motors, and Mahindra have showcased **flex-fuel vehicles**.

Economic and Environmental Impact:

◉ As per the Ministry of Petroleum and Natural Gas, between 2014 and July 2021:
  - India **saved ₹26,000 crore** in foreign exchange.
  - **Reduced GHG emissions** by 19.2 million tonnes.

◉ However, ethanol from **sugarcane** increases stress on water and land.

◉ Environmentalists advocate the use of **lignocellulosic biomass** (e.g., crop residue, wood chips) for second-generation ethanol production.

Challenges and Concerns:

◉ **Lower energy content** in ethanol → Reduced mileage.

◉ **No proportional fuel price reduction** despite import savings.

◉ Concerns about engine wear and **lack of fuel cost benefits** to consumers.

◉ Ethanol production from sugarcane may **exacerbate water scarcity** and impact food security.

Institutional and Policy Framework:

◉ **MoPNG** (Ministry of Petroleum and Natural Gas): Nodal agency for ethanol blending implementation.

◉ **NITI Aayog**: Policy think tank advocating balanced approach, including second-generation ethanol.

◉ **Ministry of Road Transport and Highways**: Notified draft changes to **Central Motor Vehicle Rules (1989)** for flex-fuel engine compliance.

COAL PLANT EXEMPTION WEAKENS AIR GOAL

Context:

The Environment Ministry exempted around 78% of India's coal-based thermal power plants from installing flue gas desulphurisation (FGD) systems meant to reduce sulphur dioxide (SO_2) emissions, citing revised categorization norms.

FGD Norms Relaxed Amidst Concerns over Air Quality and Policy Rollbacks

Background and Importance of FGD Installation

◘ SO_2 Emissions from Thermal Power Plants:

  - SO_2 released into the atmosphere reacts with ammonia to form ammonium sulfate, a major contributor to PM2.5 pollution.
  - Exposure causes serious health issues such as asthma, bronchitis, and cardiovascular diseases.

◘ Environmental and Health Hazards:

  - SO_2 contributes to acid rain and secondary particulate matter formation.
  - These pollutants severely impact public health and degrade ecosystems.

Regulatory Timeline and Policy Developments

Initial Notification (2015):

➤ Ministry of Environment mandated SO_2 and other emission control norms for coal power plants, to be met by December 2017.

➤ Power companies cited high costs and disruption risks; deadlines were extended.

Categorization Norms (2021):

➤ Plants were divided into 3 categories:

♦ **Category A**: Within 10 km of critically polluted or non-attainment cities – deadline: 2022.

♦ **Category B**: Within 10 km of the National Capital Region (NCR) – deadline: 2022.

♦ **Category C**: All remaining plants – deadline: 2024.

➤ **July 2025 Decision:**

♦ Plants in Category C that are operational till 2030 are exempted from installing FGD.

♦ Only plants set to operate beyond December 2030 will be reviewed on a case-by-case basis.

Scientific Justifications and Criticisms

Government's Justification:

➤ Studies by IIT-Delhi, NIAS, and NEERI claim that SO_2 levels around plants are within limits.

➤ FGD operation leads to increased CO_2 emissions, potentially offsetting air quality gains.

Counter-Arguments by Experts:

➤ CREA and CSE argue that monitoring systems (CAMoN) fail to capture actual SO_2 levels due to poor methodology.

➤ CSE study shows that SO_2 plumes travel long distances before converting into secondary pollutants, misleading emission inventories.

Key Concerns Raised

◉ **Dilution of Environmental Norms:** Exempting a vast majority of plants undermines clean air goals and the 2015 mandate.

◉ **Impact on Public Health:** Inadequate SO_2 regulation may perpetuate respiratory and cardiovascular health issues, particularly in vulnerable populations.

◉ Climate vs Air Quality Trade-off: The argument that FGD increases CO_2 poses a dilemma between air quality and climate change mitigation efforts.

Way Forward:

◉ **Independent Third-Party Verification:** Establish independent audits of SO_2 emission data from all coal plants.

◉ **Strengthening Monitoring Systems:** Upgrade CAMoN with better spatial coverage, remote sensing, and real-time data integration.

◉ **Adaptive Policy Framework:** Adopt a flexible but accountable approach where exemptions are based on verified performance and emission records.

◉ **Just Energy Transition Plan:** Gradually phase out polluting plants with a roadmap aligned to India's National Clean Air Programme (NCAP) and net-zero targets.

INDIA'S RENEWABLE ENERGY RISE

Context:

India's renewable energy sector has witnessed exponential growth and strategic transformation, making it globally competitive and investment-attractive.

Renewable Energy Expansion and India's Energy Transition Goals

Introduction: India's Green Energy Push

➤ India has set ambitious renewable energy targets, aiming for 500 GW of non-fossil fuel capacity by 2030.

➤ The renewable energy sector, especially solar, has witnessed exponential growth in the last decade.

Transformation of the Renewable Sector

➤ **Cost Decline and Tariff Competitiveness**

♦ Solar tariffs dropped from ₹10-18/unit (2010) to under ₹2.5/unit by 2019.

♦ Improved economies of scale, competitive bidding, and foreign investments contributed.

➤ **Investor Confidence and FDI Inflows**

♦ From $2.1 billion (2008) to over $12 billion (2022).

♦ Clean energy projects now attract global funds similar to IPL franchise-level valuations.

➤ **Role of Government Reforms**

♦ Solar parks, transparent bidding processes, and policy clarity enabled market creation.

♦ Shift from subsidy-based incentives to market-driven models.

Structural Achievements & Policy Milestones

➤ **Institutional Support and Policy Measures**

♦ National Solar Mission (2010), Ujjwala, and Saubhagya schemes promoted electricity access and clean energy.

♦ Renewable Energy Investment Promotion Board and Viability Gap Funding.

➤ **Market Instruments and New Models**

♦ Renewable Energy Certificates (RECs), Green Energy Open Access Rules.

♦ Public-private partnerships, hybrid energy parks, and grid-scale battery storage promoted.

◘ **Challenges and Emerging Issues**

➤ **Grid Integration and Transmission Bottlenecks**

♦ Interstate transmission constraints lead to curtailment of RE.

♦ Need for green corridors and storage solutions.

➤ **Policy Uncertainty and Financial Health of DISCOMs**

♦ Delayed payments, Power Purchase Agreement (PPA) renegotiations discourage private players.

♦ DISCOM financial restructuring is vital.

➤ **Land Acquisition and Environmental Clearance**

♦ Solar and wind parks often face delays due to land and forest clearances.

Way forward:

◉ **Institutional Reforms:** Establish robust dispute resolution and payment mechanisms for private investors.

◉ **Financial Instruments:** Promote green bonds, blended finance, and sovereign guarantees.

◉ **Decentralised RE Models:** Push for rooftop solar, peer-to-peer trading, and rural microgrids.

◉ **Skilling and R&D:** Invest in solar-wind hybrid tech, storage solutions, and hydrogen R&D.

◉ **Global Collaboration:** Leverage International Solar Alliance (ISA) and partnerships for tech and finance.

INDIA'S NUCLEAR ENERGY VISION 2047

Context:

The Union Budget 2025–26 announced an ambitious plan to expand India's nuclear power capacity from 8.18 GW to 100 GW by 2047, with a special allocation of ₹20,000 crore for Small Modular Reactors (SMRs) by 2033, aligning with the goals of Viksit Bharat by 2047 and net zero emissions by 2070.

India's Nuclear Energy Ambition: Aligning Energy Security with Climate Commitments

◘ **India's Nuclear Journey: Historical Context:**

Early Leadership and Vision:

➤ India was the first in Asia to commission a nuclear research reactor (Apsara, 1956) and began work on power reactors at Tarapur in 1963.

➤ Dr. Homi Bhabha had projected 8 GW nuclear power by 1980, showcasing India's early nuclear ambition.

Global Isolation and Technological Bottlenecks:

➤ India's refusal to sign the NPT and the 1974 PNE test led to global exclusion from nuclear trade, slowing down reactor development and fuel procurement.

➤ Target deadlines were missed (10 GW by 2000) due to sanctions and lack of foreign collaboration.

Indigenisation Efforts:

➤ India successfully developed **220 MW Pressurised Heavy Water Reactors (PHWRs)** using natural uranium.

➤ These designs were later scaled to **540 MW** and **700 MW**, with operational plants at Kakrapar (2024) and others under construction.

◘ **Strategic Reorientation Post-2008 and Structural Hurdles**

➤ **Global Integration After NSG Waiver:**

♦ Post-1998 nuclear tests and the 2008 **NSG waiver**, India resumed nuclear fuel imports and reactor deals with countries like Russia, France, and the U.S.

♦ Russia remains the only active external partner at Kudankulam due to pre-CLNDA agreements.

➤ **Legislative Barriers: The CLNDA Roadblock:**

♦ The **Civil Liability for Nuclear Damage Act (2010)** imposed liability on suppliers, discouraging foreign participation.

♦ India's model still centers around state ownership (NPCIL) under the **Atomic Energy Act, 1962**, making private entry unviable without reform.

➤ **Commercial and Regulatory Ambiguities:**

♦ Disputes over tariff regulation between NPCIL and distribution companies (e.g., Gujarat Urja Vikas Nigam) point to unresolved jurisdictional and policy conflicts.

♦ The **Atomic Energy Regulatory Board (AERB)**, not a statutory body, raises concerns over independent safety oversight—especially with private entry.

◘ **Pathway to 2047: Aligning Growth, Climate and Energy Security**

➤ **Growth-Driven Energy Demand:**

♦ India's current per capita income of $2,800 must rise to $22,000 for Viksit Bharat 2047. This necessitates a **five-fold increase in energy capacity**, particularly from firm, non-intermittent sources.

♦ Nuclear energy, with 50–60 years of plant life and base-load capability, is essential given the limitations of renewables (intermittency, storage costs).

➤ **Policy Innovation and Technological Diversification:**

♦ The government is investing in **indigenously designed Small Modular Reactors (SMRs)** to replace ageing captive thermal units.

♦ Expansion of 700 MW PHWR units and acceleration of delayed U.S. and French projects are key elements of future strategy.

Enabling Private Participation and Financial Reform:

⊙ Amendments to **Atomic Energy Act (1962)** and **CLNDA (2010)** are proposed to attract private and foreign investment.

⊙ Financial reforms include redefining nuclear energy as "green," enabling access to **green financing, viability gap funding**, and **foreign direct investment (FDI) up to 49%**.

India's commitment to scaling nuclear capacity to **100 GW by 2047** is both visionary and pragmatic. It strategically integrates climate commitments, energy security, and industrial growth.

BRIDGE COLLAPSE IN VADODARA

Context:

A section of the four-decade-old Mujpur–Ghambira bridge in Vadodara, Gujarat collapsed on July 9 while a family was crossing, resulting in 20 deaths and multiple injuries due to structural failure despite repeated warnings.

Structural Negligence and Policy Failures in Bridge Safety

Structural Decline and Community Warnings

➤ **Repeated Alerts Ignored**: Villagers and local representatives—including district panchayat—had flagged cracks and shaking during heavy-vehicle movement since 2017.

➤ **Government Response**: Only minor repairs were undertaken, with proposals for a new bridge under periodic review but no tangible action taken.

➤ **Immediate Cause**: The collapse resulted from the "crushing of the pedestal and articulation", per the State's initial technical findings, underscoring long-term structural weakening.

Disaster Impact on Vulnerable Lives

➤ **Human Toll**: The tragedy claimed the lives of 20 individuals, including a man praying for a male heir, highlighting the profound emotional, social, and economic impacts on bereaved families.

➤ **First-Responder Lacunae**: Despite prompt arrival of local communities and officials, rescue operations faced delays due to limited access and incapacitated infrastructure.

➤ **Livelihood Disruption**: The destroyed bridge disrupted access to Saurashtra, forcing a 50 km detour, affecting trade, healthcare access, and agricultural supply chains.

Policy and Governance Gaps

➤ **Reactive, Not Proactive**: Infrastructure maintenance remained largely reactive; only post-tragedy were key bridges identified for closure, with ₹212 crore sanctioned for a two-lane replacement.

➤ **Accountability Undertaking**: Suspension of four R&B officials indicates acknowledgement of administrative lapse, though substantive structural review and systems-level audit are not yet disclosed.

➤ **Advocated Reforms**: A high-level probe by R&B is underway; however, systemic reforms—like community surveillance integration and independent structural audits—are required to avert future disasters.

Way Forward

⊙ **Proactive Structural Audits**: Mandate periodic third-party engineering evaluations of all state and rural bridges; develop risk maps and close high-risk structures proactively.

⊙ **Institutionalize Community Reporting**: Create a formal, accessible channel for citizen reporting of infrastructure defects, with time-bound escalation protocols and transparent action reporting.

⊙ **Bridge Safety Oversight Board**: Establish an independent regulatory body tasked with monitoring bridge safety, coordinating multi-stakeholder reviews, and enforcing engineering standards.

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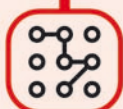
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SECTION -B

QUICK BYTES

COMMEMORATION OF RAJENDRA CHOLA I

CONTEXT

The Ministry of Culture is celebrating the birth anniversary of Rajendra Chola I through the Aadi Thiruvathirai Festival (23–27 July 2025) at Gangaikonda Cholapuram, marking 1,000 years of his Southeast Asian maritime expedition and the construction of the Chola capital temple.

Rajendra Chola I and Maritime Expansion:

- Rajendra Chola I ruled from 1014 to 1044 CE, expanding the Chola Empire to parts of Sri Lanka, Maldives, and Southeast Asia, including Srivijaya (present-day Indonesia, Malaysia, and Thailand).

- He launched a successful naval expedition to Southeast Asia, asserting Indian maritime strength, and promoting trade and diplomatic ties.

- He established Gangaikonda Cholapuram as his imperial capital after these conquests.

Chola Temple Architecture and Cultural Patronage:

- The Brihadisvara Temple at Gangaikonda Cholapuram, built by Rajendra Chola I, is a UNESCO World Heritage Site under the "Great Living Chola Temples."

- The temple showcases Dravidian architecture, intricate bronze iconography, and extensive inscriptions chronicling the Chola administration, military campaigns, and religious grants.

- The Cholas were ardent patrons of Shaivism, supporting the Nayanmars and Shaiva Siddhanta philosophy.

Aadi Thiruvathirai Festival:

- The festival commemorates Rajendra Chola's **birth star – Thiruvathirai (Ardra)**, which begins on **23rd July**.

- The event integrates **Bharatanatyam**, **Devaram chanting**, and **musical tributes**, reflecting the **Shaiva Bhakti tradition** and classical Tamil art forms.

- The **Archaeological Survey of India (ASI)** is conducting **exhibitions, guided tours**, and **heritage walks** to promote awareness of Chola-era achievements.

CHANDRASHEKHAR AZAD

CONTEXT

The Prime Minister, Shri Narendra Modi has paid tributes to Chandra Shekhar Azad on his birth anniversary. "His role in India's quest for freedom is deeply valued and motivates our youth to stand up for what is just, with courage and conviction", Prime Minister stated. `

Chandrashekhar Azad

- **Born**: 23 July 1906, Bhavra, Madhya Pradesh.

- **Real Name**: Chandra Shekhar Tiwari; took the name "Azad" after arrest in 1921.

- **Early Influence**: Joined **Non-Cooperation Movement (1920–22)**; disillusioned after its withdrawal post **Chauri Chaura incident**.

Revolutionary Associations

- **Hindustan Republican Association (HRA)**:
  - Joined under **Ram Prasad Bismil**.
  - Took part in the **Kakori Train Robbery (1925)** to fund revolutionary activities.

□ **Hindustan Socialist Republican Association (HSRA):**

➤ Co-founded with **Bhagat Singh** (1928) after Bismil's death.

➤ Adopted **socialist and Marxist** ideologies aiming for a socialist republic.

Key Revolutionary Acts

◎ **Kakori Conspiracy (1925)** – looted British treasury.

◎ **Attempt on Viceroy's life (1926)** – unsuccessful but symbolic.

◎ **Lahore Conspiracy (1928):**

➤ Involved in **Saunders' assassination** to avenge Lala Lajpat Rai.

➤ Ideological support for **Assembly bomb throwing** (1929) by Bhagat Singh & B.K. Dutt.

Death & Legacy

◎ **Died**: 27 February 1931, **Alfred Park, Allahabad** (now Chandrashekhar Azad Park).

◎ **Cause**: Shot himself to avoid British capture.

◎ **Legacy**: Symbol of fearless defiance; inspired future revolutionary nationalism.

BAL GANGADHAR TILAK (1856–1920)

CONTEXT

The Prime Minister, Shri Narendra Modi has paid tributes to Lokmanya Tilak on his birth anniversary. "He was a pioneering leader who played a vital role in kindling the spirit of India's freedom movement with unwavering conviction", Prime Minister stated.

Bal Gangadhar Tilak (1856–1920)

◎ **Born:** 23 July 1856, Ratnagiri, Maharashtra

◎ **Died:** 1 August 1920, Mumbai

◎ **Title:** *Lokmanya* – "Accepted by the people as their leader"

◎ Early advocate of **Swaraj** through **mass-based mobilization**

Educational & Cultural Contributions

◎ **Deccan Education Society (1884):** Co-founded with G.G. Agarkar; aimed for Indianized education.

◎ **Fergusson College (1885):** Promoted liberal and nationalist values.

◎ Promoted **cultural nationalism** via:

➤ Ganesh Chaturthi and Shivaji Jayanti as public festivals

➤ Used festivals to unify masses and resist colonial suppression

Role in National Movement

◎ **Surat Split (1907):** Congress split into Moderates vs Extremists; marked rise of assertive nationalism.

◎ **Home Rule Movement (1916):**

➤ Tilak started it in April 1916; Annie Besant in September 1916

➤ Tilak's League focused on Maharashtra, Central Provinces, Karnataka, Berar

➤ Mobilized the **English-speaking middle class**

◎ Lucknow Pact (1916):

➤ Congress-Muslim League agreement, Promoted **Hindu-Muslim unity** and joint constitutional demands

Writings and Journalism

◎ **Newspapers:** *Kesari* (Marathi) and *Mahratta* (English) – voiced strong anti-British opinions

◎ **Major Works:**

➤ *Gita Rahasya* – Interpreted Gita as a call for **active resistance**

➤ *The Arctic Home of the Vedas* – Claimed Aryans came from the Arctic (controversial theory)

WIFEX COMPLETES 10 YEARS

CONTEXT

The Winter Fog Experiment (WiFEX), initiated in 2015 at Delhi's IGI Airport to study North India's severe winter fog, has completed a decade of systematic observation and forecasting research.

About WiFEX

◎ **Launched:** 2015 by the Indian Institute of Tropical Meteorology (IITM), Pune.

◎ **Nodal Ministry:** Ministry of Earth Sciences (MoES).

◎ **Collaborating Agencies:** India Meteorological Department (IMD) and the National Centre for Medium Range Weather Forecasting (NCMRWF).

◎ **Primary Objective:** To understand the physical and chemical processes of fog formation and improve forecasting models for dense winter fog in the Indo-Gangetic Plain.

Significance of IGI Airport (Launch Site):

◎ One of the most fog-affected airports in India.

◎ Critical node for aviation forecasting improvement.

WiFEX-II Expansion:

◎ **Goal:** Localized, **runway-specific fog forecasting** extended to more airports like Jewar (Noida) and Hisar (Haryana).

- **Infrastructure:** Installation of dedicated fog-monitoring instruments at multiple sites.
  - ➤ **Application:** Supports aviation safety, early warning dissemination, and transport planning during fog events.

PRESIDENTIAL REFERENCE ON ASSENT POWERS OF GOVERNORS AND PRESIDENT

CONTEXT

The Supreme Court has agreed to hear a Presidential Reference under Article 143, seeking clarity on the constitutional powers and timelines concerning the President's and Governors' assent to State Bills under Articles 200 and 201.

Article 143 – Advisory Jurisdiction of the Supreme Court:

- The President can seek the opinion of the Supreme Court on questions of law or fact of public importance.
- The Court may, after such hearing as it deems fit, report its opinion to the President, but its opinion is **not binding**.

Article 200 – Governor's Assent to State Bills:

- The Governor can:
  - ➤ Assent to the Bill,
  - ➤ Withhold assent,
  - ➤ Reserve the Bill for the consideration of the President, or\
  - ➤ Return the Bill for reconsideration (if not a money bill).
- No **time limit** is prescribed in the Constitution for the Governor to act under Article 200.

Article 201 – President's Assent on Reserved Bills:

- If a Bill is reserved for the President, he may either give assent or withhold assent.
- There is **no constitutional timeline** for this decision.
- The Presidential Reference seeks to examine whether courts can impose judicial timelines in the absence of such express provisions.

Judicial Interpretation of Constitutional Powers:

- The Reference raises key issues regarding the **separation of powers**, judicial overreach, and the ambit of **Article 142**, which allows the Supreme Court to pass any order necessary for doing complete justice.

- The Tamil Nadu Governor's delay in assenting to re-passed Bills was declared unconstitutional by the Supreme Court (April 2024), invoking Article 142 to deem them assented.

PYQ:

Q: With reference to Indian polity, consider the following statements: (2022)

(1)   The President of India can summon a session of the Parliament at such place as he/she thinks fit.

(2)   The Constitution of India provides for three sessions of the Parliament in a year, but it is not mandatory to conduct all three sessions.

(3)   There is no minimum number of days that the Parliament is required to meet in a year.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

MADRAS HIGH COURT UPHOLDS TEMPLE ENTRY RIGHTS

CONTEXT

On July 17, 2025, the Madras High Court directed state authorities to ensure that Scheduled Caste (SC) devotees are not barred from entering the Puthukudi Ayyanar Temple in Tamil Nadu, invoking constitutional and statutory provisions against caste-based discrimination.

Constitutional Provisions Involved:

- **Article 15(2)**: Prohibits discrimination on grounds of religion, race, caste, sex, or place of birth in access to public places.
- **Article 17**: Abolishes "untouchability" and forbids its practice in any form.
- **Article 25(2)(b)**: Empowers the State to make laws for social welfare and reform, enabling all classes of Hindus to enter and worship in Hindu religious institutions.

Statutory Provision:

- **Tamil Nadu Temple Entry Authorization Act, 1947:**
  - ➤ **Section 3** affirms that any Hindu, regardless of caste or sect, has the right to enter and worship in Hindu temples.

➤ Overrides any custom, usage, or local law denying access based on caste.

➤ Provides for legal action against individuals or groups who obstruct such entry.

Judicial Intervention:

◎ The High Court explicitly recognized caste-based denial of temple entry as an *"actionable wrong/offence."*

◎ Directed both the **Ariyalur Superintendent of Police** and **Revenue Divisional Officer** to enforce the rights of Scheduled Caste worshippers and maintain public order.

VICE-PRESIDENT'S MID-TERM RESIGNATION

CONTEXT

Vice-President Jagdeep Dhankhar resigned before completing his term, creating a rare mid-term vacancy in the second-highest constitutional office in India.

Constitutional Provisions:

◎ **Article 63**: There shall be a Vice-President of India.

◎ **Article 66**: Election of Vice-President.

◎ **Article 67(b)**: The Vice-President may resign by writing under his hand addressed to the President.

◎ The Constitution does **not provide for an acting Vice-President**.

Function of Vice-President:

◎ Ex-officio Chairman of the **Rajya Sabha (Article 64).**

◎ In the event of resignation or vacancy, the Deputy Chairman of the Rajya Sabha performs the Chairman's duties.

Election Procedure:

◎ Conducted under the Presidential and Vice-Presidential Elections Act, 1952.

◎ The electoral college comprises members of both Houses of Parliament, including nominated members.

◎ The election uses the proportional representation system by means of a single transferable vote, through a secret ballot.

◎ State legislatures do not participate in this election.

➤ The **quota** is calculated as:

♦ **Quota** = (Total Valid Votes ÷ 2) + 1

Term of Office:

◎ Unlike a by-election for a Lok Sabha/Rajya Sabha seat, the newly elected Vice-President serves a **full five-year term**, **not the remainder** of the predecessor's term.

Timeline for Election:

◎ No constitutional deadline, but as per practice, the Election Commission is expected to conduct the poll **"as soon as possible."**

◎ The **Secretary-General of Lok Sabha or Rajya Sabha** acts as the **Returning Officer**, on a rotational basis.

Eligibility Criteria:

◎ Must be a citizen of India.

◎ Must have completed 35 years of age.

◎ Must be qualified to be elected to the Rajya Sabha.

◎ Must not hold any office of profit under the Union or State governments (exceptions: President, Vice-President, Governor, or Minister).

PYQ:

Q: **Who among the following can preside over the proceedings of the Lok Sabha in the absence of the Speaker and the Deputy Speaker of the Lok Sabha? (2017)**

(a) A member appointed by the President

(b) A member nominated by the members of the Parliament present in the House

(c) A member of the Panel of Chairpersons of the Lok Sabha

(d) A senior most member of the House

LEGAL STATUS OF RIGHT TO VOTE IN INDIA

CONTEXT

The Supreme Court is currently hearing challenges to the Special Intensive Revision (SIR) of electoral rolls in Bihar, prompting a renewed legal and constitutional debate on the status of the 'right to vote' in India.

Nature and Classification of Rights:

◎ **Natural Rights:** Inherent and inalienable; e.g., right to life and liberty. Indian courts may interpret them through fundamental rights but do not directly enforce them.

◎ **Fundamental Rights (Part III):** Enforceable via Article 32 in the Supreme Court; violation by the State is not permitted.

◎ **Constitutional Rights (Outside Part III):** Provided under the Constitution (e.g., right to property, free trade); enforceable via Article 226 or respective laws.

◎ **Statutory Rights:** Conferred and modified through legislative enactments; enforceable as per procedures laid down in the respective statutes.

Constitutional Provision on Voting:

◎ **Article 326:** Provides for universal adult franchise, stipulating that any citizen aged 18 or above, not otherwise disqualified by law, shall be entitled to vote.

◎ **Representation of the People Act, 1950:**

➤ **Section 16:** Disqualifies non-citizens from being enrolled.

➤ **Section 19:** Mandates minimum age and "ordinary residence" in a constituency.

🔲 **Representation of the People Act, 1951:**

➤ **Section 62:** Confers the right to vote to those listed in the electoral roll, with exceptions such as disqualifications or imprisonment.

Judicial Interpretation of Right to Vote:

◎ *N.P. Ponnuswami Case (1952):* Held right to vote is a **statutory right**.

◎ *Jyoti Basu Case (1982):* Reaffirmed voting as a statutory right, not a fundamental or common law right.

◎ *PUCL Case (2003):* Observed it could be a **constitutional right**, if not fundamental.

◎ *Kuldip Nayar Case (2006):* Upheld voting as **statutory**.

◎ *Raj Bala Case (2015):* Division Bench termed it a **constitutional right**.

◎ *Anoop Baranwal Case (2023):* Majority reiterated it as a **statutory right**, though Justice Ajay Rastogi's dissent associated it with Article 19(1)(a) and the basic structure doctrine.

PYQ:

Q: **Right to vote and to be elected in India is a: (2017)**

(a) Fundamental Right

(b) Natural Right

(c) Constitutional Right

(d) Legal Right

DELHI ASSEMBLY ADOPTS NEVA

CONTEXT

The Delhi Assembly has announced a three-day training programme for legislators to familiarize themselves with the National e-Vidhan Application (NeVA), a digital platform aimed at enabling paperless legislative functioning.

National e-Vidhan Application (NeVA):

◎ **Launched by:** Ministry of Parliamentary Affairs.

◎ **Objective:** To digitize the functioning of State Legislatures and Parliament through a unified platform.

◎ **Key Features:**

➤ End-to-end **paperless governance** within legislatures.

➤ Live updates of legislative proceedings.

➤ Real-time access to documents like Bills, Question Hour lists, and Committee reports.

➤ **Environmental Impact:** Promotes sustainability by reducing paper usage.

➤ **Administrative Impact:** Enhances transparency, accountability, and legislative efficiency.

TRIPURA BECOMES INDIA'S THIRD FULLY LITERATE STATE

CONTEXT

Tripura has been officially declared a fully literate state under the Ullas–Nav Bharat Saksharta Karyakram, achieving a literacy rate of 95.6% as per NEP 2020 benchmarks.

Tripura's Milestone Achievement

◎ Tripura is the **third state** in India, after **Goa and Mizoram**, to be recognised as **fully literate** under national standards.

◎ The benchmark is **95% literacy among individuals aged 15 years and above**.

◎ Tripura's literacy rate improved from **20.24% in 1961** to **95.6% in 2024**.

Role of Ullas – Nav Bharat Saksharta Karyakram

◎ Implemented under the **National Education Policy (NEP) 2020**, the **Ullas scheme** targets **non-literate youth and adults** aged 15 and above.

◎ It focuses on **foundational literacy and numeracy**, life skills, and basic education for all.

◎ The scheme is part of a **digital and volunteer-driven literacy movement**, ensuring inclusive learning access.

EIGHTH CENTRAL PAY COMMISSION

CONTEXT

The Union Government has initiated consultations with key ministries and state governments regarding the formation of the Eighth Central Pay Commission (CPC) to revise pay and pension structures for central government employees and pensioners.

Central Pay Commission (CPC):

◎ A **Central Pay Commission** is constituted periodically to review and recommend changes in the **salary structure, allowances, and pension benefits** for central government employees and pensioners.

◎ **Constitutional Backing**: Not mandated by the Constitution but derives authority from **executive resolution** under Article 73 (executive power of the Union).

◎ **Frequency**: Typically established every **10 years**.

◎ **Administrative Setup**: Comes under the **Department of Expenditure**, **Ministry of Finance**.

◎ **Composition**: Usually chaired by a **retired Supreme Court judge**, supported by bureaucrats and financial experts.

Eighth Central Pay Commission

◎ **Background:** The Central Pay Commission is constituted every decade to review and recommend changes in the salary structure, allowances, and pension schemes for central government employees and pensioners. The Seventh CPC was implemented in 2016 with effect from 1st January 2016.

◎ **Eighth CPC Formation:** In January, the Union Cabinet approved the formation of the 8th CPC. As of July 2025, inputs are being sought from ministries such as Defence, Home Affairs, DoPT, and State Governments.

◎ **Coverage:** The 8th CPC will impact approximately 50 lakh serving employees and 65 lakh pensioners.

◎ **Process:** The commission's recommendations are advisory in nature. Once submitted, they must be accepted by the Union Government before implementation. The time frame for submission and implementation has not yet been finalised.

PM INTERNSHIP SCHEME

CONTEXT

According to data provided in the Lok Sabha, only around 6% of the internship offer recipients under the Prime Minister Internship Scheme (PMIS) have joined work, highlighting poor conversion rates in the flagship youth programme.

PM Internship Scheme

▢ **About the Scheme:**

➤ The **Prime Minister Internship Scheme (PMIS)** was launched under **Union Budget 2024–25**, targeting **1 crore internships over five years** in the **top 500 private companies** in India. The scheme aims to enhance employability among youth by providing real-time industry exposure.

▢ **Implementation Details:**

➤ It operates through the **PMIS Portal**, designed to act as a one-stop interface for application, selection, and tracking of internships.

➤ The scheme is being implemented in a **phased pilot mode**.

♦ **First round:** 1.27 lakh internship opportunities posted; 6.21 lakh applications received; 82,000 offers made; ~8,700 joined.

♦ **Second round (as of July 17, 2025):** 1.18 lakh opportunities posted; 4.55 lakh applications received; 71,000 offers made; 22,500 accepted so far.

Current Concerns:

◎ The **acceptance rate is 33%**, and the **actual joining rate is just ~6%**, which raises questions regarding:

➤ Lack of awareness or follow-through among applicants.

♦ Possible mismatch in candidate skillsets or expectations.

♦ Logistical challenges in coordination between companies and interns.

POSHAN TRACKER HINDERING BENEFICIARY INCLUSION

CONTEXT

Anganwadi workers in Haryana are facing technical challenges in registering pregnant and lactating women on the Poshan Tracker app, delaying access to nutritional benefits under the Poshan Abhiyaan scheme.

Poshan Tracker App:

◎ Developed by the *Union Ministry of Women and Child Development (MWCD)*, the Poshan Tracker is a real-time digital tool for monitoring service delivery and nutritional outcomes under the *Poshan Abhiyaan* (launched in 2018).

◎ It mandates **facial recognition** and **Aadhaar e-KYC** for authentication of beneficiaries, including children through guardians' Aadhaar.

Role of Anganwadi Workers:

◎ Anganwadi workers are frontline service providers under the *Integrated Child Development Services (ICDS)*.

◎ Their duties include registering beneficiaries, ensuring nutrition supplementation, immunisation, and pre-school education.

Implementation Challenges:

◎ **Facial recognition failure** due to technical glitches, poor camera alignment, or inadequate lighting conditions.

◎ **Mismatch in Aadhaar details**, including name spelling errors, prevents successful registration.

◎ **Digital illiteracy** among some workers and limited **training** in smartphone and app usage.

◎ **Internet connectivity issues** in rural areas impede real-time data syncing and authentication.

◎ **Mobile ownership gender gap**: As per MoSPI's 2025 Telecom Survey, only **74.2% of rural women in Haryana** own a mobile phone, compared to **94% of rural men**. This gendered digital divide restricts independent access to mobile-based services.

Poshan Abhiyan :

- **Launched**: 8th March 2018 in Jhunjhunu, Rajasthan
- **Ministry**: Ministry of Women and Child Development (MWCD)
- **Target Group**: Pregnant women, lactating mothers, adolescent girls, and children (0–6 years)
- **Approach**: Targeted and convergent strategy to tackle malnutrition and related issues

Key Objectives

- **Annual Reduction Targets**: Stunting: ↓ 2% , Undernutrition: ↓ 2%, Anaemia (children/women/ adolescent girls): ↓ 3%, Low Birth Weight: ↓ 2%

Poshan 2.0 / Mission Saksham Anganwadi

Merged with Saksham Anganwadi Scheme in 2021 under Mission Poshan 2.0.

- Focuses on:
  - ➤ Upgradation of **Anganwadi Centres**: infrastructure (buildings, toilets, water).
  - ➤ Promotion of **nutri-gardens**, local food practices, and **community participation**.
  - ➤ Strengthening **immunity, health, and early childhood care**.

EU AGE-VERIFICATION PLAN UNDER THE DIGITAL SERVICES ACT

CONTEXT

The European Commission is developing an age-verification app under the Digital Services Act (DSA) to prevent minors from accessing harmful online content, particularly pornography. However, this move has sparked debates over privacy and data protection.

Digital Services Act (DSA):

- The **Digital Services Act** (DSA) is a comprehensive regulatory framework enacted by the **European Union (EU)**.
- Came into **force in November 2022** and is **directly applicable across all EU Member States**.
- It replaces the outdated **e-Commerce Directive (2000)**, marking a significant overhaul of digital governance in the EU.

Objectives of DSA

- **Protect Fundamental Rights**: Ensures online platforms respect **freedom of expression**, **privacy**, and **non-discrimination**.

- **Ensure Online Safety**: Aims to protect users—especially minors—from **illegal and harmful content**, products, or services.
- **Accountability of Tech Platforms**: Introduces **due diligence obligations** for online platforms and intermediaries like Facebook, Amazon, YouTube, etc.
- **Promote Innovation and Fair Competition**: Seeks to establish a **level playing field** in the EU Single Market by regulating dominant digital players (e.g., Google, Meta).

REPLICA OF ASHOKA PILLAR UNVEILED IN SRI LANKA

CONTEXT

A replica of the Ashoka Pillar was unveiled at Waskaduwa Sri Subhuthi Viharaya, Sri Lanka, to commemorate Emperor Ashoka's seminal role in propagating Buddhism in Sri Lanka.

Unveiling of Ashoka Pillar Replica:

- **Venue:** Waskaduwa Sri Subhuthi Viharaya, Kalutara district, Southern Province, Sri Lanka.

India–Sri Lanka Buddhist Ties:

- **India's USD 15 million grant** (announced in 2020) for Buddhist ties, includes:
  - ➤ **Free solar electrification** for 10,000 Buddhist temples and Pirivenas.
  - ➤ **Promotion of Pali language**—accorded *Classical Language* status by the Government of India in 2024.
  - ➤ Re-publication of ancient Pali treatises like *Namamala* and *Balawatharo*.
- Ongoing support for sacred Buddhist relic expositions in Sri Lanka:
  - ➤ Relics from **Sarnath**, **Kapilavastu**, and **Devnimori (Gujarat)**.
  - ➤ India halted the **auction of sacred relics** in Hong Kong, originally found in **Piprahwa (1898)**, calling for their repatriation.

PYQ:

Q: **With reference to the history of Indian rock-cut architecture, consider the following statements: (2012)**

(1) The caves at Badami are the oldest surviving rock-cut caves in India.

(2) The Barabar rock-cut caves were originally made for Ajivikas by Emperor Ashoka.

(3) At Ellora, caves were made for different faiths.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 and 3 only

(c) 3 only

(d) 1, 2 and 3

NBFCS OVERTAKE BANKS IN PERSONAL LOAN

CONTEXT

As per recent financial data, Non-Banking Financial Companies (NBFCs) increased their share in personal loan originations to 36.4% in FY25, overtaking both public and private sector banks.

Personal Loan Originations

- Refer to the process of onboarding customers for unsecured personal loans through due diligence, credit assessment, and KYC verification.

NBFCs' Rise:

- The NBFCs have captured a significant share (36.4%) in personal loan originations in FY25, up from 32.2% in FY24, driven by micro-lending in Tier-2 and Tier-3 cities and targeting small-ticket consumption loans.

Banks' Declining Share:

- Public Sector Banks (PSBs) and Private Sector Banks saw a decline in their share to 31% and 29.2%, respectively.

NRIS FACE REGULATORY HURDLES IN OPENING DEMAT ACCOUNTS

CONTEXT

Startups like Rupeeflo, in collaboration with stockbrokers such as Zerodha and Angel One, are attempting to digitize and simplify the cumbersome account opening process for Non-Resident Indians (NRIs) investing in Indian markets.

Demat Account for NRIs:

- NRIs must open a **Portfolio Investment Scheme (PIS)-linked demat account** with a registered broker to invest in Indian securities. This process involves multiple compliance steps under **RBI** and **SEBI** regulations.

Current Procedure:

- Physical submission of 20–30-page account opening forms.
- Mandatory **notarization** of Know Your Customer (KYC) documents.
- Notarization must be done through entities such as **licensed notaries**, **scheduled commercial banks**, **Indian embassies**, or **court authorities** abroad.

GIFT City Exception:

- Under the **International Financial Services Centres Authority (IFSCA)** at GIFT City, NRI onboarding is allowed through **face-to-face KYC** processes conducted by fintechs operating under a separate regulatory framework.

DEMAT ACCOUNT

Definition & Purpose

- **Demat Account** = *Dematerialised Account*
- Acts as a **digital repository** to store **financial securities electronically**.
- Eliminates the need for **physical share certificates**.

Key Functions

- Facilitates **buying, selling, holding, and transferring** of securities.
- Seamless **trading via stock exchanges**.
- Enables **online portfolio management**.

Assets Held

- **Equity shares**, **bonds**, **debentures**, **mutual fund units**, **government securities**, **Exchange-Traded Funds (ETFs)**.

Regulatory Oversight

- **SEBI** – Main regulatory authority.
- **Depositories**:
  - **NSDL** (National Securities Depository Ltd)
  - **CDSL** (Central Depository Services Ltd)

Key Concepts

- **Dematerialisation**: Conversion of **physical certificates to electronic form**.
- **Rematerialisation**: Re-conversion to **physical form** (rarely used now).
- **DP (Depository Participant)**: An intermediary between the investor and depository (e.g., banks, brokers).

HEDGE FUNDS GAIN

CONTEXT

Hedge funds are reaping significant gains after Chevron's $53 billion acquisition of Hess Corp finally concluded, following a 20-month delay caused by arbitration challenges from ExxonMobil.

Hedge Funds

- **Definition and Nature**
  - A **hedge fund** is a **private investment partnership** that pools funds from high-net-worth individuals or institutional investors.
  - It is **managed by professional portfolio managers** who employ **aggressive and diverse strategies** to maximize returns, including:
  - Leverage (borrowed money)
  - Derivatives

➤ Short-selling

➤ Arbitrage

➤ Investing in non-traditional assets (commodities, currencies, real estate)

Risk Profile and Investor Base

◉ Hedge fund investments are classified as **alternative investment vehicles** and are considered **high-risk, high-return**.

◉ They typically **require a high minimum investment or net worth**, thus targeting:

➤ **Accredited investors** (with income > $200,000/ year or net worth > $1 million excluding primary residence).

➤ **Institutional investors** like pension funds, endowments, and insurance firms.

Regulatory Framework

◉ In **India**, hedge funds are not necessarily required to be registered with **SEBI** (Securities and Exchange Board of India), though **Alternative Investment Funds (AIFs)** under Category III may include hedge fund-like structures.

◉ Globally, hedge funds are **less regulated** compared to mutual funds, particularly in jurisdictions like the **Cayman Islands** or **British Virgin Islands** where **offshore hedge funds** are domiciled.

Hedge Fund vs. Mutual Fund

Aspect	Hedge Fund	Mutual Fund
Target Investor	Accredited / wealthy investors	General public / retail investors
Instruments Used	Real estate, stocks, derivatives, currencies	Stocks, bonds, money market instruments
Regulation	Lightly regulated (e.g., SEC, SEBI-AIF Cat III)	Heavily regulated (e.g., SEBI, SEC)
Liquidity	Limited; Lock-in periods often apply	High liquidity; redeemable on demand
Strategy	High-risk, high-return, often speculative	Conservative to moderate, long-term growth
Fee Structure	High fees; typically "2 and 20" (2% mgmt + 20% profit)	Low fees (usually 0.5%–2%)

ENHANCING AGRICULTURAL MARKETING & INFRASTRUCTURE

CONTEXT

Government initiatives like e-NAM, AIF, and MIDH aim to enhance digital agri-marketing and cold storage to boost farmers' income and reduce post-harvest losses, as highlighted by recent RBI studies.

e-NAM (National Agriculture Market):

◉ **Launched in 2016** to create a **pan-India electronic trading portal** integrating the physical wholesale markets (mandis).

◉ Aims to provide **transparent price discovery**, **reduce information asymmetry**, and **enhance market access**.

◉ **Farmers Producer Organisations (FPOs)** are increasingly onboarded to facilitate collective bargaining and ensure better price realisation.

Digital Market Expansion:

◉ FPOs are now being integrated with:

◉ **e-NAM** – National electronic mandis.

◉ **ONDC (Open Network for Digital Commerce)** – democratizing digital commerce.

◉ **GeM (Government e-Marketplace)** – allowing government procurement from farmers and FPOs.

Agriculture Infrastructure Fund (AIF):

◉ Central Sector Scheme launched in 2020 for post-harvest infrastructure.

◉ Targets: Cold storages, warehousing, grading & packaging units, especially at farm-gate level.

Mission for Integrated Development of Horticulture (MIDH):

◉ Centrally Sponsored Scheme for holistic horticulture development.

◉ Support includes **Pack Houses**, **Cold Chains**, **Ripening Chambers**, **Reefer Transport**.

◉ **Subsidy Pattern**:

➤ **35%** of project cost in **general areas**.

➤ **50%** of project cost in **hilly and scheduled areas**.

◉ Implemented through **State Horticulture Missions (SHMs)**.

SUSTAINABLE AGRICULTURE AND CLIMATE-RESILIENT SEED INITIATIVES

CONTEXT

The Indian Council of Agricultural Research (ICAR) and the Ministry of Agriculture have highlighted key outcomes under the National Mission on Sustainable Agriculture (NMSA), NICRA, and weather advisory services to bolster climate-resilient farming.

Seed Varietal Development (2014–2024):

◉ ICAR has developed **2900 crop varieties**, of which **2661** are **tolerant to biotic and/or abiotic stresses** (e.g., pests, drought, heat, and flood).

◉ Under **NICRA**, 298 climate-resilient varieties were demonstrated in **11 crops** across **151 climatically vulnerable districts**, benefiting **11,835 farmers**.

Sub-Mission on Seeds and Planting Material (SMSP):

◉ Launched in **2014-15**, merged with **National Food Security and Nutrition Mission (NFSNM)** from **2023-24**.

◉ **Rs. 270.90 crore** allocated in **2024-25**, with **Rs. 206.86 crore** disbursed.

◉ Notably, **Rs. 141.46 crore** was used under the **Seed Village Programme**, which promotes decentralised seed multiplication.

Village-Level Seed Banks and Demonstrations:

◉ **Capacity building** under NICRA includes seed banks and community nurseries for localised climate resilience.

◉ Demonstrated stress-tolerant varieties include **rice, wheat, soybean, mustard, chickpea, sorghum, gram,** and **foxtail millet**.

Weather Advisory Systems for Agriculture:

◉ **Gramin Krishi Mausam Sewa (GKMS)** scheme provides **5-day district/block-level forecasts** by IMD.

◉ **130 Agromet Field Units** generate advisories in English and regional languages.

◉ Dissemination through digital platforms:

  ➤ **Meghdoot App** (Ministry of Earth Sciences) – available in **13 regional languages**.

  ➤ **Mausam App**, **eGramSwaraj**, **Gram Manchitra**, **Meri Panchayat**, and **Mausamgram Portal**.

Institutional Mechanisms for Farmer Outreach:

◉ Training and awareness under **ATMA (Agricultural Technology Management Agency)** on seed quality and modern practices.

INDORE RETAINS TOP RANK IN SWACHH SURVEKSHAN 2024–25

CONTEXT

Indore has secured the first position for the eighth consecutive year in the Swachh Survekshan 2024–25, reaffirming its leadership in urban cleanliness and waste management practices.

Swachh Survekshan Overview:

◉ It is an **annual cleanliness survey** conducted by the **Ministry of Housing and Urban Affairs** under the **Swachh Bharat Mission (Urban)**.

◉ The **2024–25 edition** was the **ninth** in the series and assessed **4,500+ cities** based on **10 parameters** and **54 indicators**.

◉ The survey is considered the **world's largest urban sanitation assessment** and has seen participation from over **14 crore citizens**.

Survey Theme:

◉ The overarching theme was **"Reduce, Reuse, Recycle"**, aligning with India's broader objectives of **sustainable urban development**.

Performance Highlights:

◉ **Indore** topped the national rankings for the **eighth consecutive year**.

◉ **Surat** and **Navi Mumbai** secured second and third places respectively.

◉ In the **3–10 lakh population category**, **Noida** ranked first, followed by **Chandigarh** and **Mysuru**.

Super Swachh League (New Initiative):

◉ Introduced to honour cities consistently in the **top three positions over the past three years** and still within the **top 20% of their population category**.

◉ Indore not only led this elite league but also received **the highest marks among all 23 cities** in this category.

◉ **Ujjain** and **Budhni** were also recognised under their respective population categories.

Population-Based Classification (First-Time Introduction):

◉ Cities were divided into **five population categories**:

  ➤ Very Small, Small, Medium, Big, and Million-plus.

◉ This structure allowed more **equitable evaluation** and comparison among **similar-sized urban areas**, enabling recognition of cities like **Panchgani, Saswad, Tirupati**, etc.

Swachh Bharat Mission (Urban):

◉ Launched in **October 2014**, it aims to achieve 100% open defecation-free status and scientific solid waste management in all statutory towns.

◉ Swachh Survekshan functions as a key monitoring and incentivising mechanism under this flagship mission.

ECO-FRIENDLY REUSABLE WATER FILTER

CONTEXT

Scientists from INST Mohali, IIT-Dharwad, and IIT-Kharagpur have developed a biodegradable, reusable water filter that removes harmful industrial dyes using a novel piezo-photocatalytic process.

Institutions Involved:

◉ Institute of Nano Science and Technology (INST), Mohali, IIT-Dharwad and IIT-Kharagpur

Pollution Problem Addressed:

◉ Industrial effluents, especially from textile industries, often discharge Congo Red and Methylene Blue dyes. These organic dyes are non-biodegradable and pose serious health hazards (skin irritation, gastrointestinal and respiratory problems).

Mechanism – Piezo-Photocatalysis:

◉ **Photocatalysis:** BFO under visible light generates reactive oxygen species (ROS) to degrade dyes.

◉ **Piezoelectric Effect:** BFO generates internal electric fields under ultrasonic vibration, enabling dye degradation in the absence of light.

◉ **Piezo-Photocatalysis:** A synergistic effect combining both, effective day and night.

Real-world Application:

◉ Successfully tested on actual wastewater from a textile plant.

◉ Potential for deployment in Jal Nigam and Namami Gange initiatives.

Use of Artificial Intelligence:

◉ Machine learning models (Random Forest, XGBoost, Neural Networks) used to predict dye degradation rates under varying experimental parameters, showcasing the integration of AI in environmental engineering.

IGI AIRPORT GETS NET ZERO WASTE TAG

CONTEXT

Delhi's Indira Gandhi International (IGI) Airport has been awarded the 'Net Zero Waste to Landfill' Platinum Certification by the Indian Green Building Council (IGBC), becoming the first Indian airport to achieve this recognition during its operational phase.

Awarding Authority and Certification Purpose:

◉ The **Indian Green Building Council (IGBC)**, under the Confederation of Indian Industry (CII), awards the 'Net Zero Waste to Landfill' Certification.

◉ The certification recognizes efforts in diverting at least 90% of operational solid waste from landfills through systematic waste segregation, composting, and recycling.

Significance of IGI Airport's Achievement:

◉ IGI Airport has **diverted approximately 95%** of its operational waste, including food and recyclable waste, away from landfills.

◉ Techniques employed include **real-time waste tracking**, **segregation using 2-bin and 4-bin models**, **Material Recovery Facilities (MRFs)**, and **in-house composting** systems.

YAMUNA WATER QUALITY DETERIORATES

Context

According to a July 2025 report by the Delhi Pollution Control Committee (DPCC), faecal coliform levels in the Yamuna River have exceeded permissible limits by over 4,000 times at several locations in Delhi, indicating severe contamination from untreated sewage.

Key Pollutants and Parameters:

◉ **Faecal Coliform Count:** At ITO Bridge, levels reached **92,00,000 MPN/100 ml**, far exceeding the **CPCB's limit of 2,500 MPN/100 ml**.

◉ **Biochemical Oxygen Demand (BOD):** Increased from 5 mg/l in June to 8 mg/l in July at Palla; peaked at 70 mg/l at ITO, against the CPCB safe limit of ≤3 mg/l.

◉ **Dissolved Oxygen (DO):** Plummeted from 6.3 mg/l to 3.4 mg/l at Wazirabad; fell to near-zero further downstream, making the water uninhabitable for aquatic life.

Causes of Deterioration:

◉ Discharge of **untreated and partially treated sewage** from **22 drains** entering the Yamuna in Delhi.

◉ Ineffective tapping and treatment of drains despite ongoing clean-up initiatives.

◉ Accumulated organic waste has significantly increased the river's oxygen demand and bacterial load.

Regulatory and Monitoring Framework:

◉ The **Delhi Pollution Control Committee (DPCC)** conducts monthly monitoring of water quality at **eight key locations** in compliance with **National Green Tribunal (NGT)** directives.

◉ The findings highlight non-compliance with **CPCB guidelines** under the **Environment (Protection) Rules, 1986**.

THE RESISTANCE FRONT (TRF) AS TERRORIST ORGANISATION BY US

CONTEXT

The United States designated The Resistance Front (TRF), a shadow affiliate of Lashkar-e-Toiba (LeT), as a terrorist organisation on July 18, 2025, following its claim of responsibility for the Pahalgam attack that killed 25 tourists and a local ponywala.

The Resistance Front (TRF)

(Figure No. 01)

Nature and Origin of TRF:

◉ The Resistance Front (TRF) is considered a proxy or "shadow outfit" of Pakistan-based Lashkar-e-Toiba (LeT).

◉ It emerged shortly after the abrogation of Article 370 in August 2019, as a part of a strategy to give militancy in Jammu & Kashmir a façade of indigenous origin.

Rationale for Formation:

◉ TRF was created to bypass international scrutiny, especially while Pakistan was under the **FATF Grey List**.

◉ By creating such groups (e.g., TRF and PAFF), Pakistan sought to deflect responsibility for cross-border terrorism and present Kashmiri militancy as domestic resistance.

Operational Modus:

◉ Security agencies assert that TRF shares personnel, logistics, and intelligence with other groups such as LeT, Jaish-e-Mohammed (JeM), and Hizbul Mujahideen.

◉ It lacks a defined hierarchical or asset-based structure, making it difficult to dismantle through traditional counter-terror mechanisms like asset freezes.

Significance of US Designation:

◉ **Diplomatic Victory for India**: Reinforces India's long-standing position on cross-border terrorism and exposes Pakistan's duplicity.

◉ **Increased Diplomatic Pressure on Pakistan**: The designation places renewed pressure on Pakistan's state apparatus to disassociate from such entities.

◉ **Limited Ground Impact**: Experts note that TRF, lacking global operations or tangible assets, may continue operating under a new name; the designation is largely symbolic unless followed by actionable international sanctions or intelligence coordination.

INS NISTAR COMMISSIONED

CONTEXT

INS Nistar, India's first indigenously designed and constructed Diving Support Vessel (DSV), was commissioned into the Indian Navy at Visakhapatnam to support deep-sea diving and submarine rescue operations.

INS Nistar

▣ **Platform Overview:**

➤ INS Nistar is one of two Diving Support Vessels (DSVs) ordered in 2018; its sister ship INS Nipun is expected to be commissioned soon.

➤ The vessel was indigenously designed and built by **Hindustan Shipyard Limited** with over **80% indigenous content** involving around 120 MSMEs, showcasing the vision of **Aatmanirbhar Bharat**.

▣ **Technical and Operational Capabilities:**

➤ **Displacement**: Approx. **10,500 tonnes**; Length: **120 metres**; Endurance: **60+ days at sea**.

➤ Equipped with **air and saturation diving systems**, **underwater ROVs**, **side-scan SONAR**, and a **15-tonne subsea crane**.

➤ Serves as the **mothership for a Deep Submergence Rescue Vehicle (DSRV)**, acquired from the UK (James Fisher & Sons) in 2018–2019.

• Onboard facilities include an **operation theatre**, **ICU, 8-bed hospital**, and **hyperbaric chamber**.

▣ **Strategic and Regional Significance:**

➤ INS Nistar strengthens India's capacity for **deep-sea submarine rescue operations**, crucial for its growing submarine fleet.

➤ Enhances **maritime domain awareness**, **HADR operations**, and India's role as a **net security provider** in the **Indian Ocean Region (IOR)**.

➤ Places India among only **12 countries worldwide** with dedicated DSRV capabilities.

➤ Dual-coast deployment: **Nistar** (Eastern Seaboard, Visakhapatnam) and **Nipun** (Western Seaboard, Mumbai) ensure rapid, simultaneous response capabilities.

SUCCESSFUL TRIALS OF AKASH PRIME

CONTEXT

The Indian Army and DRDO successfully conducted high-altitude trials of the indigenously developed Akash Prime air defence system in Ladakh, while Prithvi-II and Agni-I ballistic missiles were test-fired from Chandipur.
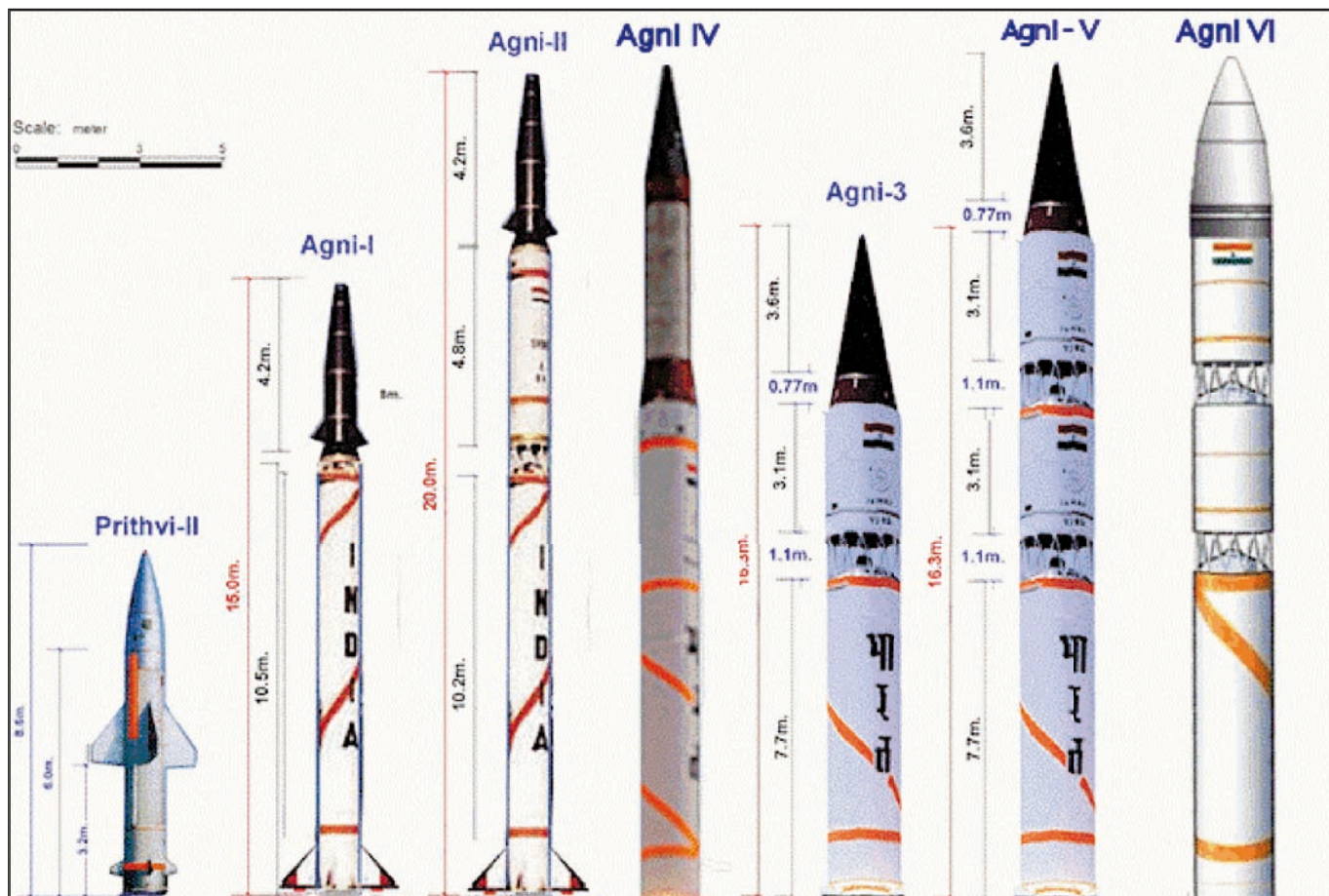
(Figure No. 02)

Akash Prime:

- It is an upgraded version of the Akash surface-to-air missile (SAM) system.

- It is designed to engage aerial targets such as aircraft, helicopters, UAVs, and cruise missiles at medium range.

- The recent trials at over 15,000 feet in Ladakh successfully demonstrated its high-altitude operational capability with direct hits on fast-moving aerial targets.

Indigenisation and DRDO Role:

- The system is developed by DRDO and is part of India's broader efforts to enhance indigenous defence manufacturing under initiatives like *Atmanirbhar Bharat* in defence.

Strategic Ballistic Missiles (Agni-I & Prithvi-II):

- **Agni-I:** A short-range ballistic missile (SRBM) with a range of ~700 km, capable of carrying nuclear warheads. It is road/rail mobile and developed under the Integrated Guided Missile Development Programme (IGMDP).

- **Prithvi-II:** Also part of IGMDP, it has a range of ~250–350 km and is a short-range ballistic missile using liquid propulsion. It is primarily used by the Indian Army.

BARYON CP VIOLATION MYSTERY

CONTEXT

Scientists at the Large Hadron Collider (LHC) reported the first-ever observation of CP violation in baryons — specifically in the Λb^0 baryon — potentially offering new insights into the matter-antimatter asymmetry of the universe.

What is the Matter–Antimatter Asymmetry Problem?

- The Big Bang is believed to have created equal amounts of matter and antimatter. However, the **observable universe is overwhelmingly matter-dominated**, with almost no free antimatter present.

- This imbalance contradicts expectations from standard cosmological models and indicates unknown physical processes at play.

What is CP Violation and Why is It Important?

- **CP (Charge-Parity) symmetry** implies that the laws of physics should remain unchanged if a particle is replaced with its antiparticle (C) and left and right are reversed (P).

- **CP violation** refers to the breakdown of this symmetry and is **essential for explaining why matter could dominate over antimatter** in the early universe.

◉ While CP violation has been seen before in **mesons (quark-antiquark pairs)**, this is the **first observation in baryons**, which are **three-quark particles like protons and neutrons**.

What Did the LHCb Detector Discover?

◉ The **Λb⁰ baryon**, composed of an up, down, and bottom quark, was studied along with its antiparticle Λb⁰-bar.

◉ The LHCb team measured how these baryons decay into specific final states (proton, kaons, and pions).

◉ A **CP asymmetry of 2.45%** was observed with **5.2 sigma significance**, exceeding the **5σ threshold required for discovery** in particle physics.

◉ The detection relied on **billions of proton-proton collisions**, **machine learning algorithms**, and **statistical techniques** to eliminate background effects.

Why Is This Discovery Important?

◉ This finding confirms that **baryons can exhibit CP violation**, expanding the domain of such violations beyond mesons.

◉ Though the amount of CP violation found is still **too small to fully explain** the matter-antimatter imbalance, it **opens new experimental avenues** to search for unknown particles or forces.

◉ It also highlights the importance of **precision experiments** at high-energy colliders like the **LHC** in probing fundamental questions of cosmology and particle physics.

BIOEMU

CONTEXT

A new deep learning model named *BioEmu*, developed by Microsoft, Rice University, and Freie Universität, has been unveiled to predict dynamic protein structures more efficiently than traditional methods like molecular dynamics simulations.

BioEmu

Introduction of BioEmu:

➤ BioEmu is an AI diffusion model trained on:

♦ Protein structures from AlphaFold predictions

♦ 200 milliseconds of MD simulations

♦ 0.5 million mutant sequences from experimental data

➤ It uses the reverse-diffusion process to generate equilibrium ensembles — the full range of stable conformations a protein may adopt under physiological conditions.
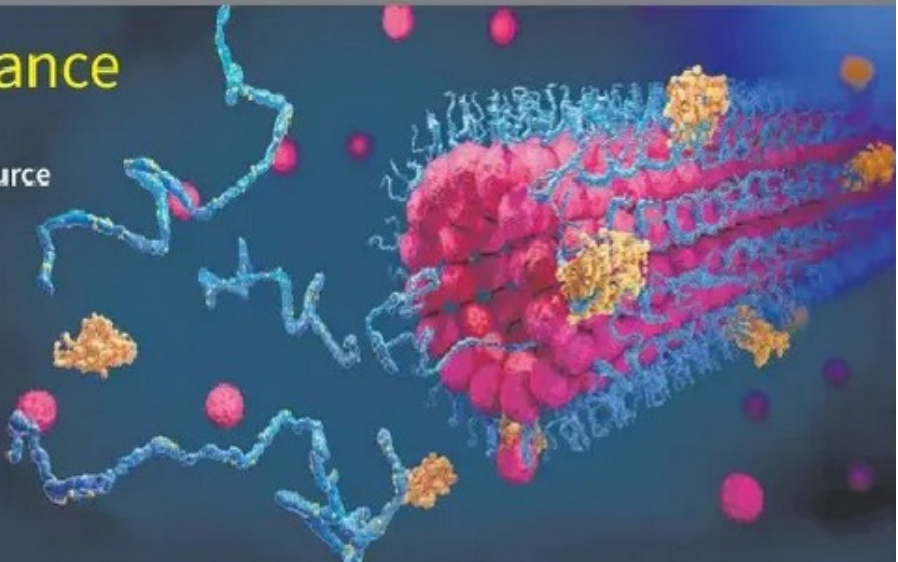
Key Capabilities:

◉ Predicts 83% of large shifts and 70–81% of small conformational changes.

Conceptual advance

BioEmu can enable large-scale drug discovery with fewer resource constraints

■ Proteins are dynamic molecules that twist and flex, with movements crucial to their biological functions

■ BioEmu, a new AI system, predicts the full range of protein shapes in biological conditions rapidly, at scale

■ Unlike slow molecular dynamics (MD) simulations, BioEmu uses AI diffusion models to generate thousands of protein conformations

■ BioEmu accurately captures large and small protein shape changes, including cryptic

pockets important for drug docking sites

■ While BioEmu produces stable protein shapes fast, it can't simulate detailed step-by-step movement pathways

■ BioEmu currently lacks modelling of protein inter-

actions and environmental factors, rendering it a hypothesis-generator

■ Combining BioEmu's speed with MD's detail offers a promising hybrid method for efficient, accurate protein flexibility studies

(Figure No. 03)

◉ Accurately models local unfolding, cryptic pocket formation, and protein flexibility, even in proteins without a stable 3D structure.

◉ Enables thousands of conformation predictions in hours on a single GPU.

Applications and Utility:

◉ Useful in drug discovery, particularly for flexible target proteins such as Ras, implicated in cancer.

◉ Assists in hypothesis generation for experimental follow-up.

◉ Can act as a pre-screening tool before running detailed MD simulations.

Limitations:

◉ Does not model interaction with drug molecules, cellular environments, pH changes, or multi-protein complexes.

◉ Offers static predictions — unlike MD, it cannot trace step-by-step molecular pathways.

◉ Prediction reliability scores like those in AlphaFold are not yet integrated.

ZIMISLECEL: LAB-GROWN ISLET CELL THERAPY

CONTEXT

A clinical trial published in *The New England Journal of Medicine* in June 2025 demonstrated promising results of *zimislecel*, a stem cell-derived islet cell therapy, in restoring insulin production in patients with severe Type 1 diabetes.

Type 1 Diabetes Mechanism:

◉ An autoimmune condition in which the body's immune system attacks pancreatic islet cells (beta cells), which produce insulin.

◉ Leads to an absolute deficiency of insulin, requiring lifelong external administration.

Current Management Limitations:

◉ Despite technological advancements like insulin pumps and continuous glucose monitoring (CGM), around 75% of patients fail to achieve glycaemic targets.

◉ Severe hypoglycaemic episodes and the inability to mimic the natural insulin rhythm remain major challenges.

Zimislecel Therapy – Innovation:

◉ A stem cell-based treatment wherein lab-grown pluripotent stem cells are differentiated into functional insulin-producing islet cells.

◉ These are infused into the hepatic portal vein, where they localise in the liver and begin insulin secretion.

◉ Therapy avoids reliance on deceased donor organs and complex extraction techniques.

INDIA'S OBESITY CRISIS

CONTEXT

A recent commentary in The Hindu highlights India's rapidly rising obesity burden, especially its links with cancer risk, urging for a shift in policy focus toward household-level and community-based prevention strategies.

Obesity – Definition and Classification:

◉ Obesity is defined as abnormal or excessive fat accumulation that presents a health risk.

◉ The Body Mass Index (BMI) is a key indicator: BMI ≥25 is classified as overweight, and BMI ≥30 as obese.

India's Obesity Landscape:

◉ According to recent national data:

 ➤ Nearly **20% of Indian households** have all adults overweight.

 ➤ **10% of Indian households** have all adults obese.

 ➤ Urban obesity is significantly higher than rural, showing clear **socio-economic and lifestyle patterns**.

◉ States like **Tamil Nadu and Punjab** report **2 out of every 5 households** with all adults classified as overweight or obese.

Link with Cancer and NCDs:

◉ As per IARC (2023), obesity increases cancer risk significantly:

 ➤ **Increases cancer risk by 17%** for individuals with pre-existing cardiovascular conditions.

 ➤ Linked to **13 types of cancers**, including breast, colorectal, oesophageal, and gallbladder cancers.

◉ Obesity fuels **chronic inflammation**, a major risk factor for:

 ➤ Insulin resistance

 ➤ Cardiovascular diseases

 ➤ Cancer

 ➤ Type-2 diabetes

ICMR'S BREAKTHROUGH IN MALARIA VACCINE DEVELOPMENT

CONTEXT

The Indian Council of Medical Research (ICMR) has announced a promising candidate malaria vaccine named 'AdVacFluVac', aimed particularly at the *Plasmodium falciparum* parasite, marking a significant advancement in India's public health and immunisation efforts.

Global and National Burden of Malaria:

◉ Malaria remains a significant public health challenge, with **~400,000 global deaths annually**, primarily in sub-Saharan Africa and South Asia.

- **In India:**
  - **Malaria cases declined** from 2.93 million (1995) to 0.18 million (2022).
  - **Deaths reduced** from 1,151 (1995) to 83 (2022), as per *National Vector Borne Disease Control Programme.*

About AdVacFluVac:

- Developed by ICMR, targeting **Plasmodium falciparum**, responsible for the most severe form of malaria.
- Developed in collaboration with private partners.
- Uses **circumsporozoite protein (CSP)**, a surface protein expressed by the parasite during infection.

Global Vaccine Landscape:

- WHO-approved vaccines:
  - **RTS,S/AS01 (Mosquirix)** – First malaria vaccine approved for pilot use.
  - **R21/Matrix-M** – Recently approved with improved efficacy.
- India's AdVacFluVac adds to this arsenal with **indigenous technology and manufacturing capability**.

GOVERNMENT MANDATES DISPLAY OF OIL AND SUGAR CONTENT ON SNACKS

CONTEXT

The Union Health Ministry has directed all government departments to prominently display oil and sugar content of popular Indian snacks in official settings, as part of its initiative to combat rising non-communicable diseases (NCDs) in India.

Objective of the Initiative:

- The Health Ministry has launched the **"Display of Sugar and Oil Boards"** initiative to promote **healthy dietary choices** through **visual behavioural nudges** in schools, offices, and public institutions.
- These boards will inform people of the **hidden fat and sugar content** in widely consumed foods such as samosa, vada paav, kachori, pizza, and burger.

Backdrop of Rising NCDs in India:

- Non-Communicable Diseases (NCDs) are responsible for **over 66% of all deaths** in India.
- Diseases such as **cardiovascular ailments, diabetes, cancers**, and **chronic respiratory diseases** are emerging as critical public health challenges, particularly among individuals **over 30 years of age**.

Definition of HFSS Foods (2024 Guidelines):

- According to ICMR-NIN Dietary Guidelines (2024), a food is classified as **High Fat, Sugar, and Salt (HFSS)** if:

  - >10% of energy comes from total sugar
  - >15% of energy comes from added fat/oil
  - Salt content exceeds 625 mg per 100g

WHO Nutritional Recommendations:

- For adults:
  - **Total fat:** < 65g/day
  - **Added sugar:** < 25g/day
  - **Salt:** < 5g/day
  - Age-specific limits exist for children.

WHO ENDORSES INJECTABLE LENACAPAVIR

CONTEXT

The World Health Organization (WHO) has released new guidelines recommending injectable lenacapavir (LEN) as a twice-yearly pre-exposure prophylaxis (PrEP) option for HIV prevention, announced during the IAS 2025 Conference in Kigali, Rwanda.

Lenacapavir (LEN):

- LEN is the **first long-acting injectable PrEP** approved for **biannual administration** to prevent HIV.
- Offers an alternative to **daily oral PrEP** (e.g., tenofovir-based regimens) and **injectable cabotegravir (CAB-LA)**.
- Demonstrates **high efficacy** in clinical trials with **minimal adherence challenges** due to only two doses required per year.

Significance of WHO Recommendation:

- Addresses persistent **HIV incidence (1.3 million new cases in 2024)**, particularly among **key populations** (e.g., sex workers, men who have sex with men, transgender individuals, injecting drug users).
- Enhances **accessibility and acceptability** of PrEP by reducing stigma and healthcare visit frequency.

LEAD POISONING IN CHINA

CONTEXT

Over 200 children in China's Hunan Province suffered lead poisoning, allegedly due to food coloring used in school snacks. A rare government acknowledgment revealed that local health officials concealed the case.

Lead Poisoning

Nature of Lead Poisoning

- Lead poisoning occurs due to the ingestion or inhalation of lead-containing materials such as paint chips, contaminated dust, water, or consumer products. It is a **cumulative toxicant** that affects multiple body systems and is particularly harmful to children under the age of 6.

Vulnerability of Children

- Children absorb more lead than adults, and their developing nervous systems are particularly sensitive to its effects.

- Symptoms in children include developmental delays, behavioral disorders, learning difficulties, reduced IQ, and physical growth retardation.

- In the United States, an estimated 500,000 children aged 1–5 years exhibit unsafe blood lead levels.

Sources of Exposure

- Major sources include:
  - Lead-based paint in homes built before 1978.
  - Soil contaminated by vehicle exhaust and leaded paint scrapings.
  - Toys, furniture, and utensils with lead-based paints or glazes.
  - Imported products (e.g., pottery, cosmetics).
  - Drinking water from lead-soldered pipes and older plumbing.
  - Certain occupations and hobbies (e.g., battery recycling, stained glass work).

Health Effects

- Lead affects nearly every organ system. Acute poisoning may cause abdominal cramps, vomiting, encephalopathy, and even death. Chronic exposure can lead to anemia, renal impairment, hearing loss, infertility, and neurocognitive damage.

Global Burden

- WHO estimates that **nearly 1 million deaths** annually are attributable to lead exposure, making it one of the top environmental health risks globally. Lead exposure is also associated with economic losses, particularly in low- and middle-income countries due to cognitive damage in children.

BURUNDI ELIMINATES TRACHOMA

CONTEXT

The World Health Organization (WHO) officially validated Burundi as having eliminated trachoma as a public health problem, making it the eighth country in the WHO African Region to achieve this status.

Trachoma

- **Trachoma** is a **neglected tropical disease (NTD)** caused by *Chlamydia trachomatis* and is the leading infectious cause of blindness worldwide.

- It spreads through **personal contact**, **contaminated surfaces**, and **flies** exposed to ocular and nasal discharges.

- **Repeated infections** can lead to **trichiasis** (inward turning of eyelashes) and **blindness**.

- WHO recommends the **SAFE strategy** for elimination:
  - **S**: Surgery for trichiasis
  - **A**: Antibiotics (e.g., azithromycin)
  - **F**: Facial cleanliness
  - **E**: Environmental improvement (water, sanitation)

- Globally, **24 countries** have eliminated trachoma as a public health problem.

- The **African Region** bears the highest burden, with **90%** of the global at-risk population residing there.

- Burundi joins seven other African countries: **Benin, Gambia, Ghana, Malawi, Mali, Mauritania, and Togo** in achieving this milestone.

- The validation by WHO reflects effective multi-sectoral collaboration and successful implementation of public health strategies targeting vulnerable communities.

CIVILIAN MASSACRE IN SUDAN'S NORTH KORDOFAN

CONTEXT

UNICEF has strongly condemned the killing of over 450 civilians—including at least 37 children and two pregnant women—in North Kordofan, Sudan.

North Kordofan, Sudan:

Geography & Demographics

- **Location:** North Kordofan is one of Sudan's 18 states (wilayat).
- **Area:** Covers approximately **185,302 square kilometers**—larger than many countries like Syria or Cambodia.
- **Population:** As of 2018 estimates, it has a population of around **3.17 million people**.
- **Capital City: El-Obeid**, a key urban center and historically significant trade city in central Sudan.
- **Climate & Ecology:** Predominantly **arid and desert**, facing **recurring droughts** since the 1960s, making it ecologically fragile.

Historical and Cultural Context

- **Ancient History:** Archaeological discovery of **graffiti of a Makurian king** at **Abu Negila** highlights the region's historic links to **Christian Nubian kingdoms**, especially the **Makurian Kingdom**, which flourished between the 6th and 14th centuries CE.

- **Tribal Inhabitants:** Historically inhabited by nomadic and semi-nomadic pastoral tribes such as:, **Dar Hamid, Dar Hamar**, **Guamaa**, **Kababish**

- These tribes practiced **transhumant pastoralism**, adapted to desert conditions.
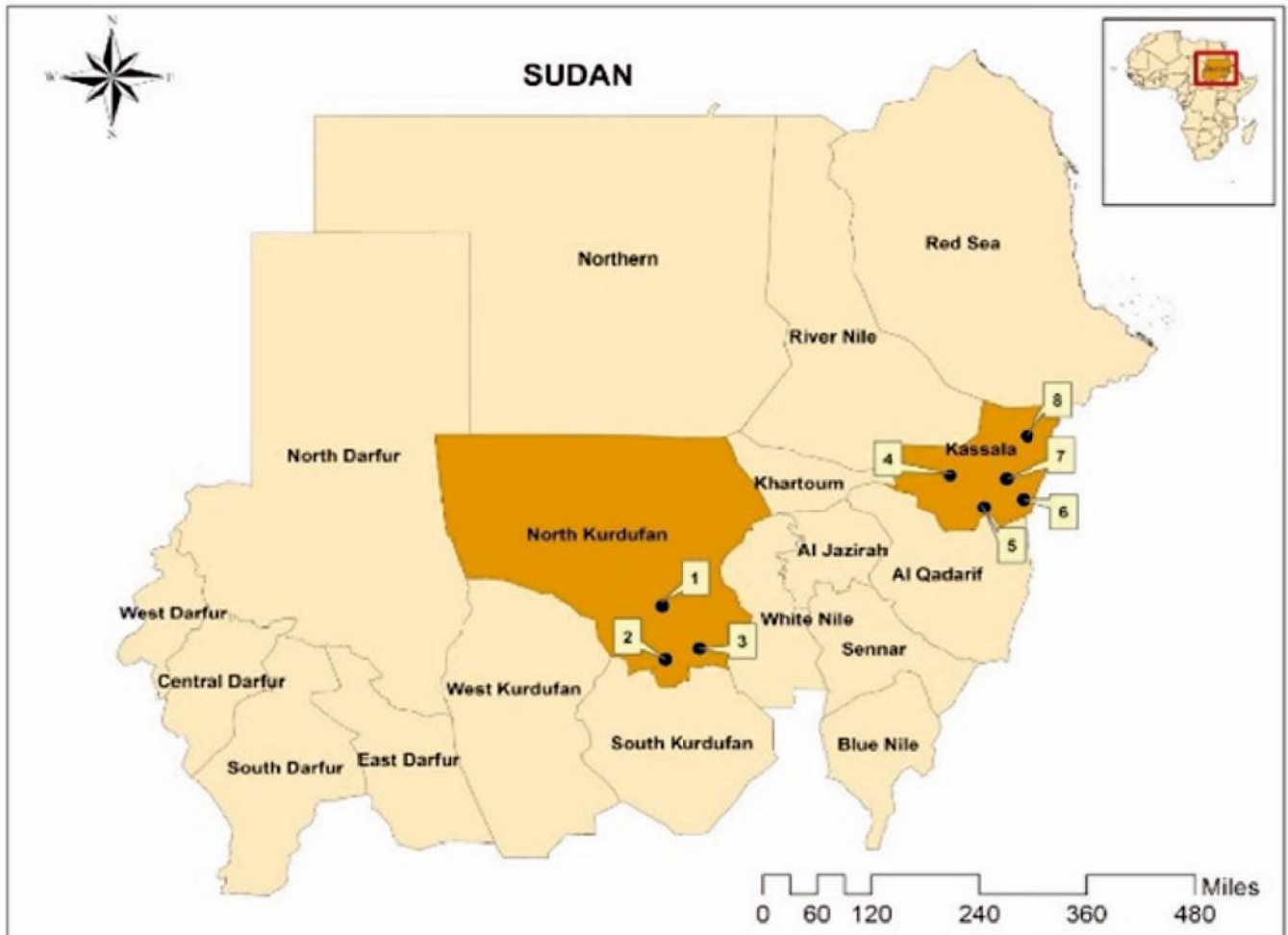
SWACHH SURVEKSHAN 2024-25

CONTEXT

The 9th edition of Swachh Survekshan, conducted under the Swachh Bharat Mission-Urban, was recently released, expanding its scope to over 4,500 cities and revising evaluation categories to better reflect urban sanitation performance.

About Swachh Survekshan and SBM (Urban):

- Swachh Survekshan is an annual cleanliness survey conducted by the **Ministry of Housing and Urban Affairs (MoHUA)** under the **Swachh Bharat Mission (Urban)**.
- Initiated in 2016, it started with fewer than 100 cities and has now scaled up to assess over **4,500 urban local bodies (ULBs)**.
- The 2024-25 edition introduced the **Super Swachh League**, dividing cities into five population categories for fairer competition.

Evaluation Parameters and Innovations:

- The survey evaluates cities on **10 key parameters**, including waste segregation, scientific processing of waste, sanitation worker welfare, and citizen feedback.
- It incorporates **third-party verification** and inputs from over **140 million residents**, ensuring robustness and transparency.
- Best practices include **Indore's six-way waste segregation**, **Surat's sewage reuse**, and **Agra's bioremediation of legacy dumpsites**.

Theme:

- The 2025 theme of **'Reduce, Reuse, Recycle (RRR)'** builds upon the previous year's 'Waste to Wealth', aiming to create **green jobs, micro-enterprises**, and boost the circular economy.
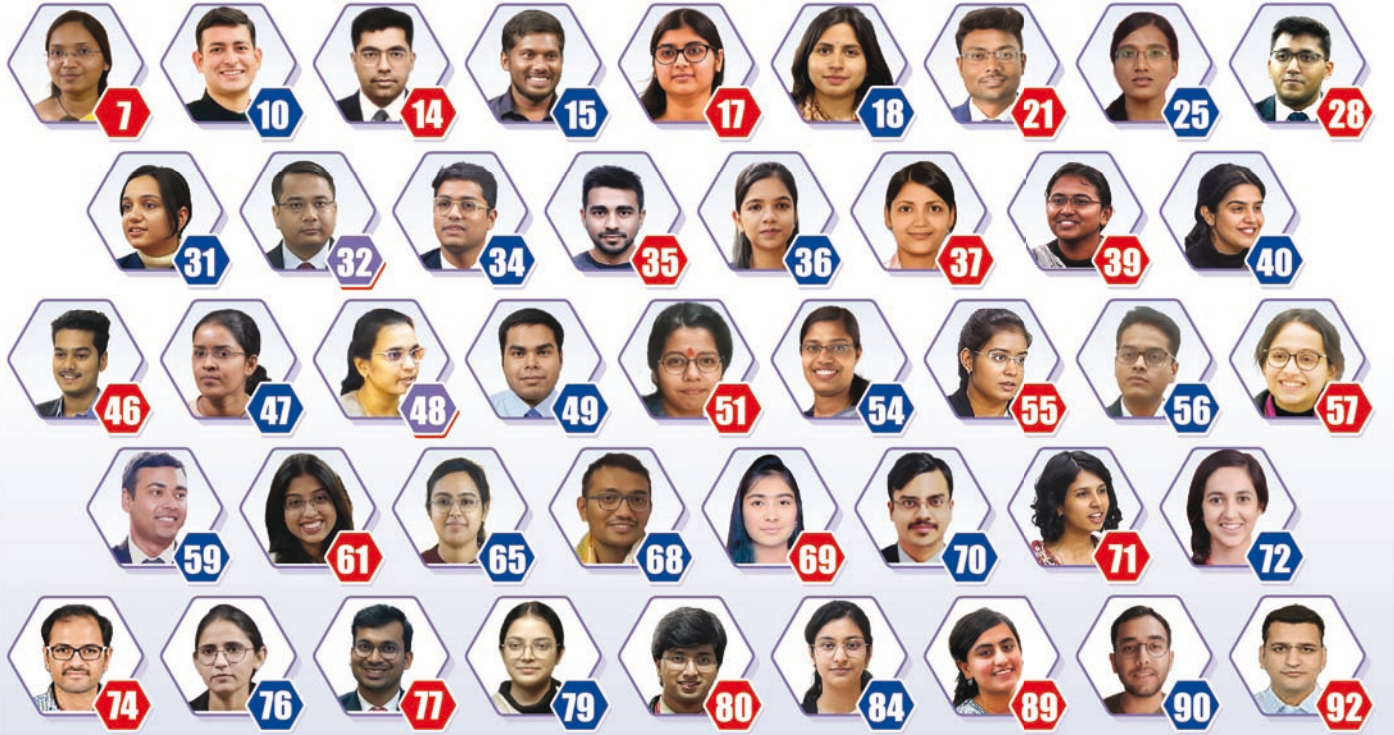- Despite infrastructure growth, **behavioural transformation** in citizen participation and ULB

★ ★ ★ ★ ★

GS SCORE
An Institute for Civil Services

CSE RESULT
TOP 100 ALL INDIA RANKING UPSC-CSE 2024

AIR 1

Scan QR Code for detailed RESULT

TOP 100 ALL INDIA RANKING UPSC-CSE 2024:
7, 10, 14, 15, 17, 18, 21, 25, 28, 31, 32, 34, 35, 36, 37, 39, 40, 46, 47, 48, 49, 51, 54, 55, 56, 57, 59, 61, 65, 68, 69, 70, 71, 72, 74, 76, 77, 79, 80, 84, 89, 90, 92

TOP 100 ALL INDIA RANKING CSE 2023
4, 9, 10, 13, 15, 16, 20, 22, 23, 24, 26, 27, 28, 29, 31, 38, 43, 47, 52, 54, 55, 58, 59, 60, 61, 62, 64, 68, 69, 72, 77, 78, 81, 82, 83, 86, 88, 89, 90, 91, 93, 95, 97, 100

TOP 100 ALL INDIA RANKING CSE 2022
1, 2, 3, 11, 12, 13, 15, 16, 18, 22, 26, 33, 34, 37, 42, 46, 48, 56, 57, 58, 60, 62, 65, 66, 68, 72, 73, 75, 77, 83, 86, 87, 91, 98

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

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