

PART I · HEADLINES TO ECONOMY

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“Every Topper's Last Read” — if a card would not survive being the last thing a serious aspirant reads before the exam, it does not belong here.

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§1 Today's Headlines

- 1 The Nagpur Bench of the Bombay High Court holds that circulating objectionable content over a WhatsApp group can satisfy the SC/ST Act's "public view" test, denying bail to the accused. **GS2**
- 2 The Bankers' Books Evidence Act, 2026 comes into force on 1 October, replacing the 136-year-old 1891 law with a tech-neutral framework for digital banking evidence. **GS2**
- 3 Supreme Court seeks the Centre's response to a petition challenging the mandatory six-stanza rendering of Vande Mataram, filed by a Nagpur-based activist. **GS2**
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- 5 India holds firm on the Indus Waters Treaty's "abeyance," having rejected a parallel Permanent Court of Arbitration proceeding pursued by Pakistan. **GS2**
- 6 The second edition of Exercise Tarang Shakti, India's largest hosted multinational air exercise, continues through 12 October. **GS3**
- 7 Two captive-bred Great Indian Bustards are released into the wild at Desert National Park, Jaisalmer — a decade-long breeding programme's first soft-release, today. **GS3**
- 8 CAFE-3 fuel-efficiency norms are notified for India's passenger-vehicle fleet, with manufacturer compliance beginning April 2027. **GS3**
- 9 The Geological Survey of India's 2023 lithium find in Reasi, Jammu & Kashmir, moves toward auction under the Union's centralised critical-minerals framework. **GS3**
- 10 CSIR-CCMB's genomic research continues to anchor India's push toward faster, India-specific sickle cell screening under the 2047 elimination mission. **GS3**

11 A new Great Indian Bustard reintroduction aviary — 160 metres long, built at a cost of ₹9.25 crore — formally opens at Ramdevra, Jaisalmer. **GS3**

12 India's two-decade vulture-recovery effort continues to anchor Environment coverage, twenty years after the 2006 diclofenac ban reversed one of the fastest wildlife declines on record. **GS3**

13 Union Environment Minister Bhupender Yadav calls the Jaisalmer bustard release “the outcome of a decade of effort,” with Rajasthan's Chief Minister joining by video link. **GS3**

THEIAS AKADEMIA Three Polity frontiers in one edition — a 1989 law meeting WhatsApp-era facts, a 136-year-old evidence statute finally retired, and a freedom-era song back before the Supreme Court — is exactly the cross-cutting density that rewards structured 1-on-1 doubt resolution: **Sahyog Mentorship**. Learn more at theiasakademia.com.

§2 Polity & Governance

GS2

Judiciary & Social Justice – SC/ST Act, “Public View” Doctrine

1–2 October 2026 (reported) · Source: Bombay High Court, Nagpur Bench; media reports

From Street Corner to Screen: Bombay HC Extends the SC/ST Act’s “Public View” Test to WhatsApp

Why in News: The Nagpur Bench of the Bombay High Court, in an order reported on 1–2 October 2026, held that circulating objectionable photographs or videos of a woman belonging to a Scheduled Caste over a WhatsApp group — including to her own relatives — satisfies the “within public view” requirement under the SC/ST (Prevention of Atrocities) Act, 1989, and denied bail to the accused on that basis. The ruling is among the first in India to extend the four-decade-old “public view” doctrine, built around physical spaces, onto private digital messaging platforms. It arrives as trial courts nationwide grapple with applying 1989-era penal language to WhatsApp groups, Instagram stories and other closed digital circles. This edition could not independently verify the exact case name or bench composition and does not assert either as fact.

Background: Sections 3(1)(r) and 3(1)(s) of the SC/ST (Prevention of Atrocities) Act, 1989 — inserted by the 2015 Amendment Act, effective January 2016 — criminalise intentionally insulting or intimidating a Scheduled Caste or Scheduled Tribe member “in any place within public view.” The Supreme Court’s bench in *Swaran Singh v. State* (2008) first clarified that “public view” is not the same as “public place”: an offence can occur inside a private space if persons other than the complainant are present and can see or hear it. *Hitesh Verma v. State of Uttarakhand* (2020) narrowed this further, holding that a caste-neutral property or civil dispute does not automatically attract the Act merely because the complainant belongs to a Scheduled Caste. Separately, *Dr Subhash Kashinath Mahajan v. State of Maharashtra* (2018) had diluted the Act’s arrest safeguards, triggering nationwide protests; Parliament restored and strengthened them through the SC/ST (Prevention of Atrocities) Amendment Act, 2018, upheld by the Supreme Court in *Prithvi Raj Chauhan v. Union of India* (2020). The present ruling sits at the next frontier of that doctrinal line: whether a “place” under the Act can be a digital space with a defined, bounded membership such as a WhatsApp group.

⚡ KEY FACTS

- SC/ST (Prevention of Atrocities) Act enacted 1989; Sections 3(1)(r)/(s) (insult/intimidation “within public view”) inserted by the 2015 Amendment Act, effective 26 January 2016.
- *Swaran Singh v. State* (2008) 8 SCC 435: “public view” is not the same as “public place”; presence of non-complainant witnesses is the operative test.
- *Hitesh Verma v. State of Uttarakhand* (2020) 10 SCC 710: a caste-neutral dispute does not automatically attract the Act.
- *Dr Subhash Kashinath Mahajan v. State of Maharashtra* (2018) diluted arrest safeguards; reversed by the 2018 Amendment Act; upheld in *Prithvi Raj Chauhan v. Union of India* (2020) 4 SCC 727.
- Section 14 of the Act mandates Special Courts/Exclusive Special Courts for speedy trial of atrocity offences.
- The National Commission for Scheduled Castes (Article 338) and National Commission for Scheduled Tribes (Article 338A) hold investigative and monitoring powers over such complaints.
- India’s internet user base exceeds 900 million, with WhatsApp the dominant messaging platform — making “digital public view” a recurring evidentiary question before trial courts.
- Denial of bail in this matter operationally treats a closed WhatsApp group as capable of meeting the “public view” threshold, pending any higher-court appeal.

📍 MAINS DIMENSIONS / ANALYSIS

- Technology outpacing text: a 1989 statute, amended in 2015 for physical-space facts, is now being stretched by judicial interpretation onto encrypted group messaging — raising the question whether Parliament, not courts, should define “digital public view.”
- Privacy tension: *K.S. Puttaswamy v. Union of India* (2017) recognised a fundamental right to privacy; extending “public view” into a private/family WhatsApp group tests where that right yields to the Act’s protective purpose.

- Evidentiary challenge: establishing who actually saw a forwarded message, and when, is far harder than proving physical presence at a public place — trial courts will need digital-forensics capacity much of the subordinate judiciary currently lacks.
- Access-to-justice gain: if upheld on appeal, the ruling closes an enforcement gap that let caste-based digital harassment escape the Act merely because it occurred inside a nominally “private” group.
- Way forward: a clearer legislative or Supreme Court standard for “digital public view” (group size, openness to new members, forwarding reach) would reduce inconsistent High Court rulings across jurisdictions.

🧠 LET'S REMEMBER THIS THROUGH A TRICK

Walk the doctrinal ladder in one line: *Swaran Singh* (2008) opened “public view” beyond “public place” → *Mahajan* (2018) nearly blunted the Act’s arrest teeth → the 2018 Amendment Act and *Prithvi Raj Chauhan* (2020) restored them → this 2026 Nagpur ruling now drags the whole doctrine onto a phone screen.

📄 PYQ LINKAGE

A dedicated past PYQ on Sections 3(1)(r)/(s)’s “public view” doctrine specifically is not confidently recalled this edition — verify independently. The adjoining rights-based angle is tested in UPSC CSE Mains, GS Paper II, 2018, on the Right to Privacy judgment’s implications for Part III freedoms.

🎯 PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding the SC/ST (Prevention of Atrocities) Act, 1989:

1. The expression “within public view” has been interpreted by the Supreme Court to mean the same thing as “in a public place.”
2. Sections 3(1)(r) and 3(1)(s), dealing with intentional insult or intimidation, were inserted by the 2015 Amendment Act.
3. The Act provides for the constitution of Special Courts for the speedy trial of offences under it.

Which of the statements given above is/are correct?

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

Answer: (b). Statement 1 is false — the Supreme Court in *Swaran Singh* (2008) explicitly held “public view” is NOT synonymous with “public place”; a private place can qualify if outsiders are present. This false-equivalence is the most commonly tested trap on this provision.

SC/ST Act 1989

Public View Doctrine

Swaran Singh v State

Digital Evidence

Article 21 Privacy

Bombay High Court

GS2

Legislation & Evidence Law – Banking Regulation Interface

A 136-Year-Old Law Retires: The Bankers' Books Evidence Act, 2026 Comes Into Force

Why in News: Provisions of the Bankers' Books Evidence Act, 2026 came into force on 1 October 2026, repealing and replacing the Bankers' Books Evidence Act, 1891. The new Act, which received Presidential assent on 13 August 2026 after passage in Parliament's Monsoon Session, builds a tech-neutral evidentiary framework under which certified copies — including Core Banking System (CBS) printouts and other digital banking records — can be produced in court as prima facie proof of their contents, without banks having to produce original ledgers or call bank officers as witnesses. It is being read as the final piece of India's post-2023 evidence-law modernisation, aligning banking-record admissibility with the wider Bharatiya Sakshya Adhiniyam (BSA), 2023 framework.

Background: The 1891 Act was a narrow, colonial-era statute designed to spare banks the burden of producing voluminous physical ledgers in every recovery suit, letting certified copies of “bankers' books” serve as evidence instead; a 2000 amendment extended it to electronic records without otherwise modernising its structure. Meanwhile, India's general evidence law moved on: the Indian Evidence Act, 1872 was replaced by the Bharatiya Sakshya Adhiniyam, 2023, in force from 1 July 2024 alongside the Bharatiya Nyaya Sanhita and Bharatiya Nagarik Suraksha Sanhita. Section 63 of the BSA (replacing the old Section 65B of the 1872 Act) lays down a mandatory certificate requirement for electronic records to be admissible — a rule the Supreme Court had already made strict in *Anvar P.V. v. P.K. Basheer* (2014) and, definitively, in *Arjun Panditrao Khotkar v. Kailash Kushanrao Gorantyal* (2020). With virtually all scheduled commercial banks now running on Core Banking Solutions, Parliament judged a dedicated, modernised banking-evidence statute necessary, rather than leaving banks to rely solely on the general BSA certificate route for every transaction record produced in litigation — including SARFAESI recovery proceedings, cheque-dishonour trials and banking-fraud prosecutions.

⚡ KEY FACTS

- The Bankers' Books Evidence Act, 1891 is repealed and replaced, not merely amended, by the Bankers' Books Evidence Act, 2026; Presidential assent 13 August 2026; commenced 1 October 2026.
- The 1891 Act's core innovation was letting certified copies of bank ledgers stand as prima facie evidence, sparing banks from producing originals or calling officers as witnesses.
- Bharatiya Sakshya Adhiniyam (BSA), 2023 replaced the Indian Evidence Act, 1872, effective 1 July 2024, alongside the BNS and BNSS.
- BSA Section 63 (replacing the old Section 65B) mandates a certificate for electronic-record admissibility.
- *Anvar P.V. v. P.K. Basheer* (2014) 10 SCC 473 and *Arjun Panditrao Khotkar v. Kailash Kushanrao Gorantyal* (2020) 7 SCC 1 made such certificates a mandatory, non-waivable requirement.
- The new Act is reported as “tech-neutral,” drafted to cover present and future digital record-keeping formats without needing repeated amendment.

- “Bankers’ books” has, since a 2000 amendment to the old Act, included printouts and digital storage media, not just paper ledgers.
- The reform directly affects evidentiary procedure in SARFAESI recovery suits, Negotiable Instruments Act Section 138 cheque-dishonour trials, and banking-fraud prosecutions — high-volume categories in India’s commercial courts.

MAINS DIMENSIONS / ANALYSIS

- Institutional harmonisation: India now has both a general digital-evidence rule (BSA Section 63) and a sector-specific one (the 2026 Act) — their definitions and certificate formats must not diverge and create fresh satellite litigation.
- Creditor-debtor balance: easing banks’ evidentiary burden speeds up recovery litigation, but risks tilting procedural advantage further toward institutional lenders over individual borrowers already disadvantaged in SARFAESI proceedings.
- Cybersecurity and audit-trail integrity: admitting CBS printouts as near-conclusive evidence raises the stakes on banks’ internal data-integrity and tamper-detection controls.
- Continuity of jurisprudence: *Anvar P.V.* and *Arjun Panditrao*’s certificate safeguards under the old Section 65B/new Section 63 framework will likely be read into the new Act’s certification clauses, preserving settled evidentiary safeguards.
- Way forward: RBI and the judiciary need coordinated technical standards (hashing, digital signatures, audit logs) so “certified” digital banking evidence is both litigation-efficient and forensically reliable.

MEMORY TECHNIQUE — RETURNING THEME

Previously covered:

BNS/BNSS/BSA commencement, 1 July 2024 (foundational evidence-law overhaul)

What’s new today:

A sector-specific banking-evidence statute (2026) replaces the 1891 colonial-era Act, operationalising BSA-aligned digital-evidence rules for banks

UPSC relevance shift:

Tests whether aspirants can connect the 2023-24 evidence-law overhaul to this year’s sector-specific follow-through

PYQ LINKAGE

No single past PYQ has directly tested the Bankers’ Books Evidence Act; aspirants should instead revisit the BNS/BNSS/BSA, 2023 trio — their effective date (1 July 2024) and what each replaces — a frequently tested 2024-25 Prelims/Mains current-affairs cluster this new Act directly extends.

PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements:

1. The Bankers’ Books Evidence Act, 2026 repeals and replaces the Bankers’ Books Evidence Act,

1891.

2. The Bharatiya Sakshya Adhiniyam, 2023 replaced the Indian Evidence Act, 1872 with effect from 26 January 2024.

3. Under Indian evidentiary law, a certificate is required for an electronic record to be admissible as evidence.

Which of the statements given above is/are correct?

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

Answer: (a). Statement 2 is false — the Bharatiya Sakshya Adhiniyam, 2023, along with the BNS and BNSS, came into force on 1 July 2024, not 26 January 2024, a date often confused with Republic-Day commencement dates used for other laws.

Evidence Law

Bankers Books Evidence Act 2026

Bharatiya Sakshya Adhiniyam

BNS BNSS BSA

Section 63

SARFAESI

GS2

Fundamental Rights – Freedom of Conscience, National Symbols

Petition filed c. 22 September 2026; SC notice issued c. 2 October 2026 · Source: media reports

Two Stanzas or Six? Supreme Court Confronts a Challenge to the Vande Mataram Mandate

Why in News: A petition filed in the Supreme Court around 22 September 2026 by Nagpur-based activist B.D. Borkar has challenged a mandate requiring the singing of all six stanzas of Vande Mataram at official and public functions, arguing that the song's later stanzas — drawn from Bankim Chandra Chattopadhyay's 1882 novel *Anandamath* — invoke explicitly religious (Hindu goddess) imagery in tension with the constitutional commitment to fraternity among citizens of all faiths. Around 2 October 2026 — Gandhi Jayanti, itself freighted with symbolism for a petition touching a freedom-era song — reports indicate the Supreme Court sought the Union government's response and signalled it would examine whether refusing to sing all six stanzas on grounds of conscience can attract any penal or administrative consequence.

Background: Bankim Chandra Chattopadhyay composed Vande Mataram in 1875 and published it within *Anandamath* in 1882; the song became a rallying anthem of the national movement after being sung at the Indian National Congress's 1896 Calcutta session. On 24 January 1950, Constituent Assembly President Rajendra Prasad made a statement according Vande Mataram status "equal" to the National Anthem, Jana Gana Mana (Rabindranath Tagore, 1911) — a status that rests on this Constituent Assembly statement, not on constitutional text, and conventionally only the first two (secular, motherland-as-nature) stanzas are taught and sung at official functions, with the latter stanzas' explicit goddess imagery largely set aside. The controlling precedent on compelled patriotic expression is *Bijoe Emmanuel v. State of Kerala* (1986), where the Supreme Court held that three Jehovah's Witness students could not be expelled for standing respectfully but not singing the National Anthem, since the Constitution compels only respect, not song. The Prevention of Insults to National Honour Act, 1971

separately penalises intentional insult to national symbols, but does not itself mandate affirmative singing.

⚡ KEY FACTS

- Vande Mataram composed by Bankim Chandra Chattopadhyay in 1875; published within the novel *Anandamath* in 1882.
- First sung at a political gathering at the 1896 Indian National Congress session in Calcutta.
- Accorded status “equal” to the National Anthem via a statement by Constituent Assembly President Rajendra Prasad on 24 January 1950 — not through constitutional text.
- Jana Gana Mana (Tagore, 1911) is India’s National Anthem; Vande Mataram is conventionally termed the “National Song,” a distinct category.
- Of six total stanzas, only the first two — free of explicit religious imagery — are conventionally taught and sung at most official functions.
- 2025 marked 150 years since the song’s composition, prompting renewed official emphasis on its commemoration.
- *Bijoe Emmanuel v. State of Kerala* (1986) 3 SCC 615 protects conscientious objectors from compulsion to sing patriotic songs, requiring only respectful conduct.
- The Prevention of Insults to National Honour Act, 1971 penalises intentional insult to national symbols but does not itself impose a duty to sing.

🎯 MAINS DIMENSIONS / ANALYSIS

- Freedom of conscience and religion (Article 25) versus any administrative push toward uniform, compulsory performance of a song with religious verses — a direct echo of the *Bijoe Emmanuel* fact pattern, updated for a different song and decade.
- Secularism as a basic-structure value: privileging one religious tradition’s imagery in a quasi-official national ritual tests the state’s constitutional neutrality among religions.
- Federalism and uniformity: any binding mandate would need to specify whether it covers only Union functions, states, or educational institutions — each raising separate legislative-competence questions.
- Historical-textual authenticity versus social cohesion: cultural traditionalists argue that singing only two stanzas edits a freedom-movement text, while objectors argue compulsion over any version offends conscience regardless of stanza count.
- Way forward: courts are likely to extend *Bijoe Emmanuel*’s logic — respect without compulsion — rather than adjudicate the song’s literary or theological content, leaving the choice of stanzas to administrative guidance rather than binding mandate.

🧠 LET’S REMEMBER THIS THROUGH A TRICK

Two numbers, one song: **2** stanzas are conventionally sung, **6** exist in the original — and **1950** is the year a Constituent Assembly statement, not the Constitution’s text, gave the song its “equal” national status.

PYQ LINKAGE

A precise past UPSC question naming *Bijoe Emmanuel v. State of Kerala* is not confidently recalled this edition — verify independently. Bankim Chandra Chattopadhyay, *Anandamath* (1882), and the 1896 Congress session form a recurring Modern History/Art & Culture Prelims fact-cluster worth revisiting alongside this card.

PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements:

1. “Vande Mataram” was accorded the status of the National Song through an explicit provision of the Constitution of India.
2. The Supreme Court has held that a citizen cannot be compelled to sing the National Anthem, provided he/she stands up and shows respect when it is played.
3. “Jana Gana Mana” was composed by Rabindranath Tagore.

Which of the statements given above is/are correct?

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

Answer: (b). Statement 1 is false — Vande Mataram’s “equal status” rests on a 1950 Constituent Assembly statement by Rajendra Prasad, not on any constitutional article; the Constitution’s text is silent on a National Song.

Vande Mataram

National Song

Bijoe Emmanuel Case

Article 25

Freedom of Conscience

Anandamath

§3 GS1 — Culture & Heritage

GS1

Indian Culture – Art, Architecture & Ancient Maritime Heritage

Excavation ongoing, Sept–Oct 2026 · Source: Tamil Nadu State Department of Archaeology; Indian Maritime University

Diving Into the Sangam Age: A Third-Phase Excavation Off Poompuhar Recovers West Asian Trade Pottery

Why in News: An underwater excavation off Poompuhar, at the mouth of the Kaveri on Tamil Nadu’s coast, entered its third phase in September 2026, conducted jointly by the Tamil Nadu State Department of Archaeology (TNSDA) and the Indian Maritime University. Diving teams working roughly 2 kilometres offshore at depths of 10–12 metres in the Bay of Bengal have recovered trade pottery, including fragments of a “torpedo jar” — a long-distance transport-amphora type associated with West Asian (Sasanian-era) maritime trade — adding physical evidence to long-standing textual claims that Poompuhar was a major hub of Indian Ocean

commerce in the Sangam age. The dig continues India's broader marine-archaeology push, alongside past investigations at Dwarka and Mahabalipuram.

Background: Ancient Poompuhar — known in Sangam literature as Kaveripoompattinam, or simply Puhar — was the principal port of the early Chola kingdom at the Kaveri's mouth on the Coromandel coast, celebrated in the Tamil epic *Silappatikaram* (traditionally attributed to Ilango Adigal) as a flourishing centre of trade, shipbuilding and urban life. Coastal erosion and relative sea-level change are believed to have submerged much of the ancient town over roughly two millennia, making it one of India's foremost submerged-heritage sites rather than a standing monument. The Archaeological Survey of India's Underwater Archaeology Wing, established in 2001, along with the National Institute of Oceanography, previously surveyed Poompuhar's seabed through the 1980s and 1990s, identifying possible wharf-like brick structures; the present round of work is led by the state department and a maritime university rather than the ASI itself. The recovery of foreign trade pottery corroborates long-standing textual and comparative-archaeological evidence (from sites such as Arikamedu) of Indo-Roman and Indo-West Asian maritime exchange along India's east coast during the Sangam period, a chronology increasingly re-examined following recent finds such as those at Keeladi.

KEY FACTS

- Poompuhar (Kaveripoompattinam) was the chief port of the early Chola kingdom, at the Kaveri's mouth on the Bay of Bengal, in present-day Mayiladuthurai district, Tamil Nadu.
- Celebrated in the Sangam-era Tamil epic *Silappatikaram*, traditionally attributed to Ilango Adigal.
- Much of the ancient town is believed submerged due to coastal erosion and sea-level change over roughly two millennia.
- ASI's Underwater Archaeology Wing was established in 2001; earlier Poompuhar surveys date to the 1980s–90s.
- The current (2026) excavation is led by the Tamil Nadu State Department of Archaeology with the Indian Maritime University, not the ASI.
- Work is conducted roughly 2 km offshore at 10–12 metre depths.
- Finds include pottery fragments identified as part of a “torpedo jar,” a West Asian (Sasanian-linked) long-distance trade-transport vessel type.
- India has not ratified the UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage.

MAINS DIMENSIONS / ANALYSIS

- Strengthens the evidentiary basis for India's centrality in ancient Indian Ocean trade networks — a historical anchor increasingly invoked in India's contemporary Indo-Pacific/SAGAR maritime-diplomacy narrative.
- Exposes a legal-protection gap: India has no comprehensive domestic underwater-heritage statute and has not ratified the UNESCO 2001 Convention, leaving submerged sites more vulnerable to trawling damage than land monuments protected under the Ancient Monuments and Archaeological Sites and Remains Act, 1958.

- Centre-State coordination question: marine excavation capacity and credit here sit with a state department and a maritime university rather than the ASI, raising questions about integrating state-level archaeological capacity into Centrally-coordinated marine-heritage policy.
- Comparative significance: Poompuhar joins Dwarka, Mahabalipuram and the terrestrial Keeladi excavations in a cluster of finds reshaping the chronology and geographic spread of early historic and Sangam-age urbanisation in India.
- Way forward: a dedicated, multi-year-funded marine-heritage programme, an interpretation centre at Poompuhar, and eventual accession to the UNESCO 2001 Convention would strengthen both protection and public engagement.

LET'S REMEMBER THIS THROUGH A TRICK

Pair the three submerged-port sites for Prelims recall: **Dwarka** (Gujarat, Arabian Sea, Krishna-era tradition), **Mahabalipuram** (Tamil Nadu, Pallava-era “Seven Pagodas” legend), and **Poompuhar** (Tamil Nadu, Chola-era Kaveri-mouth port, *Silappatikaram*) — three coasts, three textual traditions, one shared theme of coastal submergence.

PYQ LINKAGE

UPSC CSE Prelims has periodically tested Sangam Age/Sangam literature themes, and the Keeladi excavations featured in Prelims current-affairs preparation around 2019–20; an exact verbatim citation for Poompuhar specifically is not confidently recalled this edition — verify independently before quoting a specific year.

PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding Poompuhar:

1. It has been identified with the ancient port city of Kaveripoompattinam, mentioned in Sangam literature.
 2. It is located at the mouth of the river Kaveri on India's western coast.
 3. The Archaeological Survey of India's Underwater Archaeology Wing was established in 2001.
- Which of the statements given above is/are correct?

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

Answer: (b). Statement 2 is false — Poompuhar lies on India's eastern (Coromandel/Bay of Bengal) coast in Tamil Nadu, not the western coast; this east-west mix-up is a common Prelims trap for coastal heritage-site questions.

Poompuhar

Underwater Archaeology

Silappatikaram

Sangam Age

Kaveripoompattinam

Maritime Heritage

§4 International Relations

GS2

International Relations – India's Neighbourhood, Transboundary Water Treaties

*Continuing dispute; most recent confirmed development August 2026 · Source: Ministry of External Affairs;
Permanent Court of Arbitration proceedings (as reported)*

Abeyance, Seventeen Months On: The Indus Waters Treaty's Unresolved Stand-Off

Why in News: The Indus Waters Treaty, 1960 remains suspended in all but name more than seventeen months after India placed it “in abeyance” following the 22–23 April 2025 terror attack at Pahalgam, and the dispute continued generating diplomatic friction into October 2026. India’s most recent confirmed position, articulated in August 2026, rejected the jurisdiction of a Permanent Court of Arbitration proceeding that Pakistan has pursued over the treaty’s implementation, calling the parallel use of the treaty’s own Neutral Expert and Court of Arbitration tracks a manipulation that itself violates the treaty’s dispute-resolution design. Pakistani officials have continued pressing the issue in diplomatic and multilateral forums through the autumn, while India has maintained that the abeyance continues until Pakistan “credibly and irrevocably” ends cross-border terrorism.

Background: Signed on 19 September 1960 in Karachi under World Bank mediation by Prime Minister Jawaharlal Nehru and President Ayub Khan, the Indus Waters Treaty allocated the three “eastern” rivers — Ravi, Beas and Sutlej (roughly 33 million acre-feet annually) — to India, and the three “western” rivers — Indus, Jhelum and Chenab (roughly 135 million acre-feet annually) — to Pakistan, an approximate 20:80 split that nonetheless survived the 1965, 1971 and 1999 India-Pakistan conflicts until 2025, making it one of the world’s most durable transboundary water agreements. The treaty built a three-tier dispute mechanism: the Permanent Indus Commission first, then a Neutral Expert for technical “differences,” and a Court of Arbitration for broader legal “disputes” — a design whose overlapping use by both sides, dating to the Kishenganga and Ratle hydropower disputes from 2016 onward, has itself become a source of friction. A Neutral Expert process delivered an initial decision in January 2025, with a fuller award expected around end-2026, even as India’s abeyance and its August 2026 rejection of the parallel Court of Arbitration’s jurisdiction leave the treaty’s practical status unresolved.

⚡ KEY FACTS

- Indus Waters Treaty signed 19 September 1960, Karachi, brokered by the World Bank.
- Eastern rivers (Ravi, Beas, Sutlej) allocated to India; western rivers (Indus, Jhelum, Chenab) allocated to Pakistan — roughly a 20:80 share of total treaty waters.
- Survived the 1965, 1971 and 1999 India-Pakistan conflicts without suspension until 2025.

- India placed the treaty “in abeyance” on 23 April 2025, following the Pahalgam terror attack of 22 April 2025.
- Dispute-resolution architecture: Permanent Indus Commission → Neutral Expert (technical differences) → Court of Arbitration (legal disputes).
- A Neutral Expert process delivered an initial decision in January 2025; a fuller award is anticipated around end-2026.
- India rejected the Permanent Court of Arbitration’s jurisdiction in August 2026, calling parallel use of both dispute tracks incompatible with the treaty’s design.
- Pakistan responded to India’s 2025 abeyance by suspending the 1972 Simla Agreement and imposing trade and airspace restrictions.

MAINS DIMENSIONS / ANALYSIS

- This is the first outright suspension of the treaty by either party since 1960, testing whether a framework explicitly designed to be “insulated” from broader political and security hostility can survive being used as leverage.
- The parallel Neutral Expert/Court of Arbitration tracks expose a structural ambiguity in the treaty text over what counts as a technical “difference” versus a legal “dispute” — a drafting gap now central to the stand-off.
- Abeyance is a potent diplomatic signal but has limited immediate hydrological effect without new Indian storage or diversion infrastructure on the western rivers, raising the question of how credible the leverage actually is in the near term.
- Downstream Pakistani agriculture, overwhelmingly dependent on the western rivers’ flows into Punjab and Sindh, faces an acute water- and food-security exposure that gives the dispute an outsized humanitarian dimension.
- Way forward: proposals range from treaty “modernisation” (accounting for glacier-fed flow variability and climate change, absent from the 1960 text) to permanently clarifying which dispute forum has primacy — though any renegotiation requires a diplomatic thaw neither side currently shows signs of pursuing.

LET’S REMEMBER THIS THROUGH A TRICK

Keep the split straight: **E-B-S to India** (Eastern rivers — Ravi, Beas, Sutlej), **I-J-C to Pakistan** (Indus, Jhelum, Chenab) — roughly a 20:80 water share that held through three wars but not through an abeyance declared in 2025.

PYQ LINKAGE

The Indus Waters Treaty has featured as an example in past Mains answer-writing on India’s treaty obligations and water diplomacy with neighbours; an exact year/wording citation for this specific framing is not confidently recalled this edition and should be verified independently before being quoted as a precise past question.

PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding the Indus Waters Treaty, 1960:

1. Under the treaty, India has unrestricted and exclusive use of the waters of the Chenab, Jhelum and Indus rivers.
2. The treaty established a Permanent Indus Commission with one commissioner each from India and Pakistan.
3. The World Bank is a signatory party to the treaty, alongside India and Pakistan.

Which of the statements given above is/are correct?

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

Answer: (b). Statement 1 is false — Chenab, Jhelum and Indus are the “western rivers” allocated to Pakistan’s use, not India’s (India retains only limited, non-consumptive uses on them); Statement 3 is false — the World Bank mediated and performs limited procedural roles but is not a principal party to the treaty’s substantive obligations, which bind only India and Pakistan.

Indus Waters Treaty

India-Pakistan

Permanent Court of Arbitration

Transboundary Rivers

Pahalgam Attack

Neutral Expert

GS2

International Relations – India's Bilateral Defence Partnerships (Static Profile)

Static Topic — institutional profile; last confirmed edition March 2025 · Source: Ministry of Defence; open-source defence reporting

Carrier to Carrier: The Institutional Depth of Exercise Varuna and the India-France Naval Partnership

Why in News: Exercise Varuna, the long-running bilateral naval exercise between India and France, anchors this edition’s International Relations coverage as a static institutional profile rather than a breaking news item. The series’ most recently confirmed edition — its 23rd — was held in March 2025, with both nations’ aircraft carriers, INS Vikrant and Charles de Gaulle, operating together in an extended, high-end serial. A further edition is understood to fall within the India-France exercise calendar around this time of year, consistent with the series’ recent cadence of roughly one edition every 12–18 months; rather than assert unconfirmed specifics of any 2026 edition’s dates or venue, this card profiles the partnership’s institutional depth, itself a standing theme in India’s multi-alignment defence diplomacy.

Background: Varuna traces its origins to informal India-France naval cooperation from 1983, before being formally named in 2001, making it one of India’s oldest bilateral naval exercises — a pillar of the broader India-France strategic partnership formalised in 1998. Successive editions have progressed from basic surface manoeuvres to full carrier-strike-group, submarine and integrated air-defence serials: the 21st edition (January 2023) was held off Goa with India’s MiG-29K fighters and France’s Charles de Gaulle carrier group; the 22nd edition (September 2024) moved to the Mediterranean, involving the French Navy’s nuclear attack submarine Suffren; and the 23rd edition (March 2025) saw both countries’ aircraft carriers exercise together. The exercise sits alongside deep procurement ties — the Rafale fighter and Kalvari-

class (Scorpene-design) submarine programmes — that make France one of the few partners with this degree of high-end naval and air interoperability with India.

⚡ KEY FACTS

- Varuna began informally in 1983; formally named and structured from 2001.
- Anchored in the India-France strategic partnership, formalised in 1998.
- 21st edition: January 2023, off Goa (India's Western Naval Command area).
- 22nd edition: September 2024, Mediterranean Sea, including the French submarine Suffren.
- 23rd edition: March 2025, featuring both nations' aircraft carriers (INS Vikrant, Charles de Gaulle) operating together.
- Complementary procurement pillars: Rafale fighter aircraft (IAF) and Kalvari-class (Scorpene-design) submarines (Indian Navy).
- Toulon, on France's Mediterranean coast, is the French Navy's largest base and home port of the Charles de Gaulle carrier group.
- France holds Indian Ocean territories (Reunion, Mayotte), giving it a standing Indo-Pacific naval presence that makes it a geographically "resident" partner, unlike most of India's other Western defence partners.

🎯 MAINS DIMENSIONS / ANALYSIS

- Carrier-to-carrier and submarine-level interoperability with France is rare among India's partnerships, reflecting a qualitatively deeper defence-technology relationship than most bilateral naval exercises offer.
- France's Indian Ocean territorial presence (Reunion, Mayotte) makes it a "resident" Indo-Pacific power, giving Varuna strategic weight beyond a routine bilateral drill.
- The bilateral-only format limits Varuna's coalition-signalling value compared to multilateral exercises like Malabar, even as it allows a depth of high-end drills a larger multilateral format could not easily accommodate.
- Varuna exemplifies India's "multi-alignment" defence posture — deepening simultaneously with France, the US-led Quad, and Russia — without formal treaty-alliance commitments to any one axis.
- Way forward: periodic proposals to widen select Varuna serials into an India-France-UAE trilateral framework would extend the partnership's reach into the Western Indian Ocean and Gulf.

🧠 LET'S REMEMBER THIS THROUGH A TRICK

Three editions, three signatures: **21st** (Jan 2023, Goa, MiG-29Ks), **22nd** (Sept 2024, Mediterranean, submarine Suffren), **23rd** (Mar 2025, both carriers together) — a steady climb in complexity, not just a repeated drill.

📄 PYQ LINKAGE

UPSC CSE Prelims 2016, GS Paper I, included a match-the-following item on India's bilateral military exercises (including the India-France air exercise "Garuda" and the India-UK naval exercise "Konkan"); verify its exact wording independently before quoting it. A Varuna-specific past question is not confidently recalled this edition.

 PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. With reference to India's bilateral exercises, consider the following pairs:

1. Exercise Varuna — India and France (Navy)
2. Exercise Garuda — India and France (Air Force)
3. Exercise Konkan — India and Japan (Navy)

Which of the pairs given above is/are correctly matched?

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

Answer: (a). Pair 3 is incorrectly matched — Exercise Konkan is India's bilateral naval exercise with the United Kingdom, not Japan (India's principal bilateral naval exercise with Japan is Exercise JIMEX).

Exercise Varuna

India-France

Naval Diplomacy

Rafale

Scorpene Submarines

Indo-Pacific

THEIAS AKADEMIA An abeyant treaty and a four-decade naval partnership show how slowly IR architecture shifts and how fast its flashpoints can surface — the layered static-plus-current preparation **ANTIM 2027** is built around. Learn more at theiasakademia.com.

§5 Defence & Security

GS3

Defence – Multinational Military Exercises, Indigenous Platforms

24 September – 12 October 2026 (ongoing) · Source: Indian Air Force; Ministry of Defence

India's Air Force Hosts the World: The Second Edition of Exercise Tarang Shakti

Why in News: The second edition of Exercise Tarang Shakti — India's first and largest multinational air exercise — is under way from 24 September to 12 October 2026, meaning the drill is live as this edition goes to print. It follows the template of its inaugural 2024 edition: India hosting, rather than merely joining, a large multinational combat-air exercise that brings foreign air forces onto Indian soil to fly alongside the IAF's indigenous and imported fleets. Exact 2026 participant lists and host-base assignments were still being confirmed through official channels

as this edition was finalised; readers should treat specific country- and aircraft-type claims for the 2026 edition with caution pending official IAF confirmation, while the exercise's scale and institutional significance are well established from its first edition.

Background: Tarang Shakti's inaugural edition ran from 6 August to 14 September 2024 in two phases: Phase 1 at Sullur Air Force Station, Tamil Nadu (6–14 August, with France, Germany, Spain and the UK), and Phase 2 at Jodhpur Air Force Station, Rajasthan (30 August–14 September, with Australia, Greece, Japan, Singapore, the UAE, the USA and Sri Lanka, alongside roughly eighteen observer nations) — around 150 aircraft in all. The exercise was conceived to showcase India's indigenous platforms, including the Tejas light combat aircraft and the Akash air-defence system, in a multinational operating environment, complementing India's existing bilateral air exercises such as Cope India (with the US), Garuda (with France) and Desert Knight. Its two-base, two-phase design deliberately tests both a southern/maritime-facing environment (Sullur) and a northern/desert, high-altitude environment (Jodhpur), reflecting the range of operational conditions the IAF must plan for.

KEY FACTS

- 1st edition: 6 August – 14 September 2024; two phases; roughly 150 aircraft.
- Phase 1 base (2024): Sullur Air Force Station, Tamil Nadu — France, Germany, Spain, UK.
- Phase 2 base (2024): Jodhpur Air Force Station, Rajasthan — Australia, Greece, Japan, Singapore, UAE, USA, Sri Lanka; c. 18 observer nations.
- Showcased indigenous platforms including the Tejas light combat aircraft and the Akash air-defence system.
- 2nd edition confirmed scheduled: 24 September – 12 October 2026.
- Positions India as a host (not just participant) of large-format multinational air exercises, distinct from its bilateral drills (Cope India-US, Garuda-France, Desert Knight).
- The exercise's multi-doctrine mix — NATO-aligned, Quad and Gulf air forces together on Indian soil in 2024 — is a rare single-venue interoperability showcase.
- A biennial-style cadence (2024, 2026) would place Tarang Shakti alongside large international air drills like the US's Red Flag or France's Orion as a recurring fixture.

MAINS DIMENSIONS / ANALYSIS

- Converts India from a historical “exercise participant” into an exercise host and convenor, projecting Atmanirbhar Bharat defence platforms to a multinational audience on home soil.
- Bringing together NATO-aligned European air forces, Indo-Pacific partners (Japan, Australia, Singapore) and Gulf states (UAE) in one venue reflects India's simultaneous, non-aligned engagement across multiple strategic theatres.
- Hosting dozens of foreign squadrons across two bases strains airspace-management, logistics and basing capacity — a real operational cost weighed against the exercise's diplomatic and interoperability value.
- Observer-nation participation (around 18 in 2024) extends the exercise's soft-power reach well beyond its flying participants, functioning as much as a defence-diplomacy platform as a tactical

drill.

- Way forward: institutionalising Tarang Shakti on a predictable multi-year calendar, as this 2026 second edition suggests, would let partner air forces plan long-term participation and deepen interoperability gains over successive editions.

🧠 LET'S REMEMBER THIS THROUGH A TRICK

Keep the 2024 geography straight: **Sulur** (Tamil Nadu, Phase 1, Western European air forces) is the “coastal” phase; **Jodhpur** (Rajasthan, Phase 2, the larger Indo-Pacific-plus-Gulf-plus-US phase) is the “desert” phase. Two phases, two terrains, one indigenous-platform showcase.

📋 PYQ LINKAGE

A Tarang-Shakti-specific past UPSC question is not confidently recalled this edition. Aspirants should ensure fluency with India's standing bilateral air exercises — Cope India (USA), Garuda (France), Desert Knight (France), Indra (Russia) — a frequently tested Prelims pairing theme that Tarang Shakti's multinational format now sits alongside.

🎯 PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Exercise “Tarang Shakti,” India's first multinational air exercise hosted on its own soil, had its inaugural edition conducted at which of the following pairs of air force stations?

(a) Pune and Jamnagar (b) Sulur and Jodhpur (c) Ambala and Halwara (d) Tezpur and Chabua

Answer: (b). The inaugural 2024 edition was held in two phases at Sulur Air Force Station (Tamil Nadu) and Jodhpur Air Force Station (Rajasthan).

Tarang Shakti

Multinational Air Exercise

Tejas

Akash

Sulur

Jodhpur

GS3

Internal Security – Coastal Security Architecture (Static Topic)

Static Topic — not tied to a current event · Source: Indian Coast Guard; Ministry of Defence; NCSMCS

The Grid Behind the Coastline: Understanding India's Coastal Security Architecture

Why in News: With no single fresh coastal-security news event meeting this edition's verification bar, Defence & Security's second card profiles the institutional architecture of India's coastal security — the Indian Coast Guard and the multi-agency framework built after the 26 November 2008 Mumbai terror attack exposed how a sea-route infiltration could bypass India's land-border defences entirely. This is a pre-approved static institutional topic under the product's Defence fallback protocol, rotated independently of any single day's headlines, and remains a perennial UPSC GS3 internal-security theme.

Background: The Indian Coast Guard was established under the Coast Guard Act, 1978 as an armed force of the Union under the Ministry of Defence, with a mandate covering maritime law

enforcement, search and rescue, marine environmental protection, and coastal/offshore security within India's territorial waters and Exclusive Economic Zone. The 26/11 Mumbai attacks, in which terrorists infiltrated by sea using a hijacked fishing trawler, exposed critical gaps in coastal surveillance and multi-agency coordination, triggering a sweeping post-2008 overhaul: creation of the National Committee for Strengthening Maritime and Coastal Security (NCSMCS) to coordinate the Navy, Coast Guard, state marine police, Customs and port authorities; raising of the Navy's Sagar Prahari Bal for close-coast patrolling; mandatory registration and tracking of fishing vessels; and a three-tier coastal-security grid (territorial waters, contiguous zone, EEZ) with layered Navy-Coast Guard-state police responsibility. Periodic joint exercises involving the Coast Guard, Navy, Customs, state marine police and fisheries/port authorities test this architecture's coordination, communication and joint-response capacity along India's roughly 7,500-kilometre coastline.

KEY FACTS

- Indian Coast Guard established under the Coast Guard Act, 1978, functioning under the Ministry of Defence.
- India's coastline spans approximately 7,500 km across nine coastal states and four Union Territories.
- The 26 November 2008 Mumbai attacks (infiltration via a hijacked fishing trawler) triggered the post-2008 coastal-security overhaul.
- The National Committee for Strengthening Maritime and Coastal Security (NCSMCS) coordinates the Navy, Coast Guard, state marine police, Customs and port/fisheries authorities.
- The Indian Navy's Sagar Prahari Bal was raised for close-coast and harbour-approach patrolling.
- India's coastal-security grid is layered across territorial waters (12 nautical miles), the contiguous zone (24 nm) and the Exclusive Economic Zone (200 nm).
- Mandatory fishing-vessel registration and tracking (including transponder/AIS-based systems) followed directly from 26/11-related gaps.
- Periodic joint coastal-security exercises test visit-board-search-seizure (VBSS) drills and simulated hijack/smuggling/infiltration scenarios across India's maritime states.

MAINS DIMENSIONS / ANALYSIS

- Coastal security closes the "last-mile" sea-to-shore gap that 26/11 exposed, where attackers exploited an unregulated, low-surveillance fishing-boat corridor rather than any heavily-guarded land border.
- Multiplicity of Central (Navy, Coast Guard) and state (marine police, Customs, port authorities) agencies creates jurisdictional and coordination friction that joint exercises can only partly resolve absent clearer unified command.
- Parliamentary and CAG reviews have repeatedly flagged persistent gaps: large numbers of unregistered or under-tracked small fishing boats, patchy radar/AIS coverage in certain stretches, and Coast Guard manpower and asset shortfalls relative to its expanding mandate.

- High-value coastal infrastructure — major ports, offshore oil and gas platforms, and coastal industrial installations — raises the stakes of any residual surveillance gap well beyond the 2008 fishing-trawler scenario.
- Way forward: faster, fuller rollout of the National Automatic Identification System and an integrated Coastal Surveillance Network, sustained Centre-state intelligence-sharing protocols, and dedicated Coast Guard capacity expansion matched to its widening EEZ-era mandate.

🧠 LET'S REMEMBER THIS THROUGH A TRICK

Anchor the post-26/11 architecture to three pillars: **Committee** (NCSMCS — coordination), **Force** (Sagar Prahari Bal — close-coast patrol), **Grid** (territorial waters – contiguous zone – EEZ — layered jurisdiction). One coordinating body, one dedicated force, one zoned map.

📌 PYQ LINKAGE

India's internal-security Mains questions recur almost annually in GS Paper III; a coastal-security-specific past question could not be confidently pinned to an exact year this edition — aspirants should independently verify any citation before quoting it, and should revisit the 26/11 post-mortem reforms as a standing answer-writing reference point.

🎯 PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding India's coastal security architecture:

1. The Indian Coast Guard was constituted under the Coast Guard Act, 1978, as an armed force of the Union.
2. The National Committee for Strengthening Maritime and Coastal Security was constituted after the 2008 Mumbai terror attacks.
3. The Indian Navy's Sagar Prahari Bal is responsible for patrolling India's land borders adjoining Pakistan and Bangladesh.

Which of the statements given above is/are correct?

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

Answer: (a). Statement 3 is false — Sagar Prahari Bal is a close-coast/maritime patrolling force under the Indian Navy, not a land-border guarding force (land borders with Pakistan and Bangladesh are primarily the BSF's mandate).

Indian Coast Guard

Coastal Security

26/11

NCSMCS

Sagar Prahari Bal

Internal Security

THEIAS AKADEMIA

A multinational air exercise and the institutional grid behind coastal security both test whether structures built for one era's threats can flex to meet the next — the applied, institution-first thinking **EMP (Ethics & Moral Philosophy)** trains aspirants to bring to GS4. Learn more at theiasakademia.com.

§6 Science & Technology

GS3

Science & Technology – Genomics & Public Health Missions

Mission ongoing since 1 July 2023; institutional profile · Source: Ministry of Health & Family Welfare; CSIR-CCMB

Genomics Meets the Last Mile: CCMB and India's Sickle Cell Elimination Mission

Why in News: India's National Sickle Cell Anaemia Elimination Mission (NSCAEM), launched on 1 July 2023 from Shahdol, Madhya Pradesh, continues its push toward universal genetic screening in high-prevalence tribal districts, with CSIR's Centre for Cellular and Molecular Biology (CCMB), Hyderabad — one of India's leading genomics institutes — contributing decades of research on Indian sickle-cell mutation patterns toward faster, field-deployable screening and severity-assessment tools. This card profiles the Mission's institutional and scientific architecture rather than asserting a single newly launched product this week, since this edition could not independently verify the specific details of any newly announced tool with the certainty this product requires; readers should treat very recent specific-tool claims circulating elsewhere with caution pending official confirmation.

Background: Sickle cell disease is a genetic blood disorder, inherited in an autosomal recessive pattern, in which a point mutation in the gene coding for haemoglobin distorts red blood cells into a rigid "sickle" shape, causing chronic anaemia, painful vaso-occlusive crises and organ damage. It disproportionately affects India's tribal (Scheduled Tribe) populations, with carrier prevalence reaching into double digits in some belts of Madhya Pradesh, Maharashtra, Gujarat, Chhattisgarh, Odisha and Jharkhand. The NSCAEM targets screening roughly 7 crore people aged 0–40 in affected districts, with a stated goal of eliminating sickle cell disease as a public health problem by 2047 — the centenary of Indian independence. Point-of-care solubility tests provide rapid field screening, with confirmatory diagnosis via High-Performance Liquid Chromatography (HPLC) or haemoglobin electrophoresis; CCMB's long-running genomic research on the "Arab-Indian haplotype" of the sickle mutation — associated with a comparatively milder clinical course than African haplotypes — underpins efforts to build India-specific, technology-assisted diagnostic and severity-assessment tools suited to resource-constrained tribal healthcare settings.

⚡ KEY FACTS

- National Sickle Cell Anaemia Elimination Mission launched 1 July 2023, from Shahdol, Madhya Pradesh.
- Elimination target year: 2047 (centenary of Indian independence).
- Screening target: approximately 7 crore people aged 0–40 across high-prevalence districts.

- Sickle cell disease is an autosomal recessive genetic disorder caused by a mutation in the gene coding for haemoglobin.
- High-prevalence states include Madhya Pradesh, Maharashtra, Gujarat, Chhattisgarh, Odisha and Jharkhand, concentrated in tribal (Scheduled Tribe) populations.
- Diagnostic pathway: a point-of-care solubility test for rapid field screening, confirmed via HPLC or haemoglobin electrophoresis.
- CCMB Hyderabad, a CSIR institute, has long studied the “Arab-Indian haplotype” of the sickle mutation found in Indian populations.
- The Mission is intended to integrate with the Ayushman Bharat Digital Mission for longitudinal patient tracking.

MAINS DIMENSIONS / ANALYSIS

- Genomics-to-public-health translation: CCMB exemplifies how a basic-research institute's decades of population genetics can feed directly into a national screening mission's diagnostic toolkit.
- Equity dimension: targeting Scheduled Tribe populations links this Mission directly to the broader ST welfare and last-mile healthcare-delivery agenda, a recurring GS2 social-justice theme.
- Ethical and consent questions attend any large-scale genetic screening programme in tribal communities, including data privacy, multi-language informed consent, and avoiding stigmatisation of carrier status.
- The 2047 target sits inside India's wider pattern of centenary-linked public-health and development goals, testing institutional capacity for multi-decade programme continuity across changes in government.
- Way forward: scaling point-of-care, technology-assisted diagnostics — reducing dependence on manual HPLC reads in remote areas — is central to reaching screening targets within budget and workforce constraints; CCMB-style research institutes partnering directly with implementation ministries is a model worth replicating for other genetic-disease missions.

LET'S REMEMBER THIS THROUGH A TRICK

One gene, two copies: sickle cell disease needs the mutated gene from **both** parents (autosomal recessive) — one copy alone gives only “sickle cell trait,” which is why screening programmes must test broadly, not just the visibly symptomatic.

PYQ LINKAGE

UPSC CSE Mains, GS Paper II, 2018 asked about local community-level health interventions as a prerequisite for “health for all” in India — thematically adjacent to NSCAEM's district-level, community-screening model; verify the exact wording independently before quoting it. No sickle-cell-specific past PYQ is confidently recalled this edition.

PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding Sickle Cell Disease and India's response to it:

1. Sickle cell disease is caused by a mutation in the gene coding for haemoglobin.
2. It follows an autosomal dominant pattern of inheritance.
3. The National Sickle Cell Anaemia Elimination Mission aims to eliminate the disease as a public health problem by 2047.

Which of the statements given above is/are correct?

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

Answer: (b). Statement 2 is false — sickle cell disease follows an autosomal recessive, not dominant, pattern of inheritance: two copies of the mutated gene (one from each parent) are required to manifest the disease, while carriers with one copy generally remain without major symptoms.

Sickle Cell Disease

NSCAEM

CCMB

Genomics

Tribal Health

Haemoglobinopathy

GS3

Science & Technology – Space-Based Remote Sensing (Static Conceptual Topic)

Static Topic — technology-principle explainer · Source: ISRO; NASA

Radar in Orbit: The Science of SAR and InSAR Behind NISAR

Why in News: With this edition's verification bar not met by a specific breaking S&T story, the second Science & Technology card profiles Synthetic Aperture Radar (SAR) and Interferometric SAR (InSAR) — the technology principle behind NISAR (NASA-ISRO Synthetic Aperture Radar), the landmark joint NASA-ISRO Earth-observation satellite launched in 2025 — as a durable, frequently tested conceptual topic rather than a dated news item.

Background: Unlike optical satellites, which passively capture reflected sunlight and are blocked by cloud cover or darkness, SAR instruments actively transmit microwave pulses toward the Earth's surface and record the reflected signal, allowing all-weather, day-and-night imaging. "Synthetic aperture" refers to the technique of combining signals received as the satellite moves along its orbit to synthesise the resolution of a much larger physical antenna than could practically be flown. InSAR extends this by comparing the phase difference between two or more SAR images of the same location taken at different times, detecting ground-surface displacement — from earthquakes and landslides to glacier movement and subsidence — at millimetre-level precision. NISAR, a joint NASA-ISRO mission launched in 2025, is distinctive for carrying dual-frequency radar (an L-band instrument from NASA and an S-band instrument from ISRO) on a single platform, the first satellite to do so, enabling it to sense both finer surface features (S-band) and penetrate deeper into vegetation canopy and soil (L-band) in the same observation.

⚡ KEY FACTS

- SAR actively transmits and receives microwave signals, enabling all-weather, day-and-night Earth imaging — unlike passive optical remote sensing.

- “Synthetic aperture” combines signals along the satellite’s flight path to simulate a much larger antenna, improving image resolution.
- InSAR compares the phase of repeat SAR images over the same location to detect ground displacement at millimetre-scale precision.
- NISAR (NASA-ISRO Synthetic Aperture Radar) is the first satellite to carry both L-band (NASA) and S-band (ISRO) radar instruments on one platform.
- Typical SAR/InSAR applications: earthquake and landslide monitoring, glacier and ice-sheet movement, land subsidence, flood mapping, forest biomass and agricultural monitoring, and disaster response.
- L-band radar penetrates deeper into vegetation canopy and soil; S-band radar is more sensitive to finer surface features and smaller-scale changes.
- SAR’s cloud- and darkness-penetrating capability makes it especially valuable for monitoring India’s monsoon-affected and Himalayan terrain, where optical satellites face frequent cloud cover.
- NISAR builds on ISRO’s own prior SAR missions (such as RISAT) and complements India’s broader Earth-observation satellite constellation.

MAINS DIMENSIONS / ANALYSIS

- All-weather, day-night imaging capability gives SAR/InSAR a disaster-management edge over optical remote sensing precisely when it matters most — during monsoon flooding or immediately after an earthquake, when cloud cover or darkness would blind optical sensors.
- NISAR’s joint NASA-ISRO architecture is a template for high-cost, high-capability space-science missions pooling two agencies’ distinct technological strengths (L-band from NASA, S-band from ISRO) rather than either building a comparable dual-frequency instrument alone.
- Millimetre-precision ground-displacement monitoring has direct application to Himalayan geodynamic hazard monitoring (land subsidence, glacial-lake changes) — a theme of acute and growing policy relevance for India’s hill states.
- Open data-sharing commitments attached to missions like NISAR raise questions about balancing open scientific access with any strategic-sensitivity considerations over high-resolution radar imagery of Indian and neighbouring territory.
- Way forward: integrating NISAR-class InSAR data into India’s existing disaster-management and agricultural-monitoring institutional pipelines (NDMA, ISRO’s Bhuvan portal) is the key translation step from raw capability to policy usefulness.

LET’S REMEMBER THIS THROUGH A TRICK

Optical “takes a photograph”; SAR “sends a radar ping and listens.” That is the whole reason SAR works through clouds and in the dark when optical cannot.

PYQ LINKAGE

UPSC CSE Prelims has periodically tested Synthetic Aperture Radar and its applications in a statement-based format; the exact statement set is not confidently recalled verbatim this edition —

verify this citation independently before quoting it, though SAR/remote-sensing fundamentals remain a well-established, recurring Prelims GS3 theme.

 PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding Synthetic Aperture Radar (SAR):

1. SAR is a passive remote-sensing technique that depends on sunlight reflected from the Earth's surface.
2. SAR can be used to image the Earth's surface during both day and night and through cloud cover.
3. NISAR is the first satellite to carry both L-band and S-band radar instruments on a single platform.

Which of the statements given above is/are correct?

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

Answer: (b). Statement 1 is false — SAR is an active remote-sensing technique: it transmits its own microwave signal and measures the reflection, which is precisely why, unlike passive optical sensors, it does not depend on sunlight and can image through clouds and at night.

Synthetic Aperture Radar

InSAR

NISAR

ISRO-NASA

Remote Sensing

Disaster Management

THEIAS AKADEMIA From sickle-cell genomics to the radar physics behind NISAR, today's Science & Technology coverage spans biology and space in a single morning — the breadth-with-depth **LAKSHYAM AIR1** is designed to convert into rank-defining Mains answers. Learn more at theiasakademia.com.

§7 Economy

GS3

Economy-Environment Interface – Vehicle Emission & Fuel Efficiency Regulation

Notified; effective from April 2027 · Source: Society of Indian Automobile Manufacturers (SIAM); Bureau of Energy Efficiency

Tightening the Fleet Average: CAFE-3 Norms Notified for India's Passenger Vehicles

Why in News: India's third-phase Corporate Average Fuel Efficiency (CAFE-3) norms have been notified and are set to take effect from April 2027, the Society of Indian Automobile Manufacturers (SIAM) confirmed in media coverage around early October 2026. CAFE-3 tightens fleet-average fuel-consumption and carbon-dioxide-emission limits that passenger-

vehicle manufacturers must meet across their entire model range sold in India, continuing a regulatory tightening cycle that has run since CAFE-1 in 2017 and is explicitly designed to accelerate the industry's shift toward more fuel-efficient, hybrid and electric vehicles ahead of the mandated compliance date.

Background: Corporate Average Fuel Efficiency norms, administered by the Bureau of Energy Efficiency under the Energy Conservation Act, 2001, regulate the sales-weighted average fuel consumption (expressed as CO₂ grams per kilometre) across a manufacturer's entire passenger-vehicle fleet, rather than setting a limit for any single model. CAFE-1, covering 2017–2022, set a fleet-average target of 130 grams CO₂/km; CAFE-2, covering 2022–2027, tightened this to 113 grams CO₂/km while offering “super-credits” that let manufacturers count electric and strong-hybrid vehicle sales favourably toward their fleet average, incentivising cleaner technology adoption without an outright mandate. Because the standard is fleet-wide rather than per-model, manufacturers can continue selling larger or less efficient vehicles so long as they are offset by smaller, hybrid or electric vehicles elsewhere in the range — a design that nudges rather than bans. CAFE-3 is the next tightening phase in this trajectory, feeding directly into India's Nationally Determined Contributions under the Paris Agreement and its 2070 net-zero pathway announced at COP26.

KEY FACTS

- CAFE norms are administered by the Bureau of Energy Efficiency under the Energy Conservation Act, 2001.
- They regulate a manufacturer's sales-weighted fleet-average fuel consumption/CO₂ emissions, not any single model's performance.
- CAFE-1 (2017–2022): fleet-average target of 130 grams CO₂/km.
- CAFE-2 (2022–2027): tightened target of 113 grams CO₂/km, with “super-credits” for EVs and strong hybrids.
- CAFE-3: notified, with manufacturer compliance beginning April 2027, per SIAM.
- Non-compliance with CAFE fleet-average targets attracts financial penalties on manufacturers.
- The norms are a central plank of India's push to meet its 2070 net-zero commitment announced at COP26 (Glasgow, 2021).
- CAFE operates alongside, but is distinct from, the FAME (Faster Adoption and Manufacturing of Electric Vehicles) scheme — CAFE regulates through a fleet-average mandate, FAME through direct demand incentives.

MAINS DIMENSIONS / ANALYSIS

- Fuel-efficiency regulation functions as an indirect push toward electrification — rewarding a cleaner fleet average — in contrast to FAME's direct subsidy approach, giving India a two-pronged regulatory-plus-incentive EV-transition strategy.
- Compliance costs fall unevenly: EV-forward manufacturers gain fleet-average headroom to sell more profitable larger ICE vehicles elsewhere, while ICE-heavy manufacturers face a harder compliance path, raising competitive-fairness questions within the industry.

- Tightening standards align with India's NDC and 2070 net-zero pathway, but their real-world emissions impact depends on actual on-road driving conditions, which often diverge from standardised test-cycle results.
- Consumer-facing trade-off: compliant vehicles may carry a higher upfront price from efficiency/hybrid/EV technology, offset by lower running costs over the vehicle's life — a trade-off that affects affordability-sensitive segments of India's auto market most.
- Way forward: CAFE-3's weight-based, fleet-average formula could be compared with the European Union's flatter, more uniform CO₂-per-km norms as India considers whether an even tighter CAFE-4 should move toward a simpler, harder cap in the 2030s.

LET'S REMEMBER THIS THROUGH A TRICK

Three phases, falling numbers: CAFE-1 (**130** g CO₂/km, 2017–22) → CAFE-2 (**113** g CO₂/km, 2022–27) → CAFE-3 (tighter still, effective April 2027) — remember it as a fleet-average ratchet, not a per-car ban.

PYQ LINKAGE

UPSC CSE Prelims 2021 carried a statement-based question on vehicular emission norms (BS-VI/Euro-VI) and the pollutants they regulate; CAFE norms belong to the adjacent fuel-efficiency/CO₂ regulatory family rather than tailpipe-pollutant limits. A CAFE-specific past question is not confidently recalled this edition — verify the 2021 citation's exact wording independently before quoting it.

PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding India's Corporate Average Fuel Efficiency (CAFE) norms:

1. CAFE norms set a fuel-efficiency limit that every individual passenger-vehicle model sold in India must separately meet.
2. CAFE norms are administered by the Bureau of Energy Efficiency under the Energy Conservation Act, 2001.
3. CAFE-2 norms allowed “super-credits” that favoured electric and strong-hybrid vehicle sales in a manufacturer's fleet-average calculation.

Which of the statements given above is/are correct?

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

Answer: (b). Statement 1 is false — CAFE norms apply to a manufacturer's sales-weighted fleet average, not to each individual model separately; a manufacturer may sell less-efficient models so long as they are offset by more efficient ones elsewhere in its range.

CAFE-3 Norms

Fuel Efficiency

Bureau of Energy Efficiency

Net Zero 2070

Electric Vehicles

SIAM

Counting the Factory Floor: What the Annual Survey of Industries Actually Measures

Why in News: Rather than cite specific Annual Survey of Industries (ASI) 2024-25 figures that this edition could not independently verify with confidence, this card profiles the ASI itself — India's principal annual statistical instrument for the registered manufacturing sector — as the data architecture underpinning a large share of India's industrial-policy debate, from Make in India outcomes to the formal-informal employment divide.

Background: The Annual Survey of Industries, conducted by the National Statistical Office (NSO) under MoSPI, is India's oldest continuous industrial statistical series, tracing its lineage back to 1959, and is the principal source of data on the country's registered ("organised") manufacturing sector. It covers factories registered under Sections 2m(i) and 2m(ic) of the Factories Act, 1948 — broadly, units employing ten or more workers using power, or twenty or more without power — capturing Gross Value Added, output, employment, fixed and invested capital, and wages. Because it is a detailed, factory-level survey rather than a rapid indicator, the ASI is typically released with a lag of roughly eighteen months to two years after its reference financial year, in contrast to the Index of Industrial Production (IIP), a monthly volume index that offers near-real-time but much less granular tracking of industrial activity. ASI data feeds directly into the National Accounts Statistics' estimation of the manufacturing sector's contribution to GDP, making its methodology and coverage a recurring subject of economic-policy debate, particularly around the gap between registered manufacturing's data footprint and India's much larger informal manufacturing workforce that the ASI does not capture.

⚡ KEY FACTS

- ASI is conducted annually by the National Statistical Office (NSO) under MoSPI; the series' lineage traces to 1959.
- It covers factories registered under Sections 2m(i)/2m(ic) of the Factories Act, 1948 (broadly, 10+ workers with power or 20+ without).
- Captures Gross Value Added (GVA), output, employment, fixed and invested capital, and wages at the factory level.
- Reference period is the Indian financial year (April–March); results are typically released 18–24 months after the reference year.
- Distinct from the Index of Industrial Production (IIP), a monthly volume index that is faster but far less granular than the ASI.
- ASI data feeds directly into the manufacturing-sector component of India's National Accounts Statistics (GDP estimation).
- The survey does not capture India's informal/unregistered manufacturing sector, which independent estimates suggest employs a workforce multiple times larger than the registered sector it does cover.

- ASI findings are commonly used to assess outcomes of schemes such as Make in India and the Production-Linked Incentive (PLI) scheme.

MAINS DIMENSIONS / ANALYSIS

- The formal-informal manufacturing employment gap that the ASI cannot capture is central to India's "jobless growth" and "premature deindustrialisation" debates, since a rising registered-sector GVA can coexist with stagnant total manufacturing employment once the much larger informal sector is considered.
- The ASI's fixed-capital-to-output ratio over successive surveys serves as a rough proxy for automation and capital-intensity trends in Indian manufacturing, relevant to debates on capital-versus labour-intensive industrial policy.
- The 18–24-month release lag creates a genuine policymaking tension: using the ASI's detailed but stale data alongside faster, less granular real-time proxies like GST and e-way-bill generation data.
- ASI-based evaluation is central to assessing whether flagship programmes like Make in India and the PLI scheme are durably raising manufacturing's share of GDP, or merely shifting activity between formal-sector categories.
- Way forward: supplementing the ASI's detailed-but-lagged factory census with faster administrative-data proxies (GST returns, EPFO payroll data, e-way bills) could narrow the gap between statistical accuracy and real-time policy responsiveness.

LET'S REMEMBER THIS THROUGH A TRICK

Do not confuse the twins: **ASI** is annual, factory-level, detailed, and slow (18–24-month lag); **IIP** is monthly, index-based, and fast but shallow. One counts the floor in detail, the other reads the pulse in real time.

PYQ LINKAGE

UPSC CSE Mains, GS Paper III, has repeatedly featured questions on raising manufacturing's share of India's GDP, including through the MSME sector — a theme for which the ASI is the core underlying statistical source; an exact year/wording citation is not confidently recalled this edition — verify independently before quoting a specific past question.

PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding the Annual Survey of Industries (ASI):

1. It is conducted by the National Statistical Office under the Ministry of Statistics and Programme Implementation.
2. It is a monthly survey providing a real-time volume index of industrial production.
3. It covers only factories registered under the Factories Act, 1948.

Which of the statements given above is/are correct?

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

Answer: (b). Statement 2 is false and describes the Index of Industrial Production (IIP), not the ASI — the ASI is an annual (not monthly) factory-level survey, released with a

considerable lag, and is far more granular but far less timely than the IIP.

Annual Survey of Industries

MoSPI

NSO

Factories Act 1948

Index of Industrial Production

Manufacturing GVA

GS3

Economy – Critical Minerals, Mining Reform

Discovery confirmed February 2023; auction process under the 2023 framework · Source: Geological Survey of India; Ministry of Mines

Lithium in the Shivaliks: Reasi's Critical-Mineral Block and J&K's First Auction Push

Why in News: Jammu & Kashmir's Reasi district — site of India's first confirmed lithium discovery — continues to be the focus of India's critical-minerals auction push under the post-2023 mining framework, as the Union Territory moves toward its first mineral-block auctions under the Ministry of Mines' e-auction process. The Geological Survey of India first reported an inferred (G3-level) lithium resource of 5.9 million tonnes in the Salal-Haimana area of Reasi in February 2023 — India's first lithium find of this scale — and the block's progress toward auction marks one of the earliest tests of India's redesigned critical-minerals auction regime being applied to a Union Territory with little prior history of mineral-block auctions of its own.

Background: The Mines and Minerals (Development and Regulation) Amendment Act, 2023 reclassified lithium and several other "critical and strategic minerals" out of the restricted atomic-minerals category and centralised their auction authority with the Union government rather than state governments, specifically to accelerate exploration and auctioning in response to India's near-total import dependence on lithium, cobalt and other battery-grade minerals essential to the electric-vehicle and energy-storage transition. Auctions under this framework are conducted via the Ministry of Mines' MSTC e-auction platform. Jammu & Kashmir, reorganised into a Union Territory in August 2019, has a limited prior history of conducting its own mineral-block auctions, making any concluded auction process for the Reasi block a notable administrative first for the Union Territory. Reasi district itself sits in the Shivalik and lower-Himalayan belt of the Jammu division, along the Chenab river system, and already hosts the 690-megawatt Salal Hydroelectric Project — meaning the district combines hydropower and now critical-mineral significance within the same river valley.

⚡ KEY FACTS

- Geological Survey of India reported an inferred (G3-level) lithium resource of 5.9 million tonnes in the Salal-Haimana area, Reasi district, J&K, in February 2023 — India's first lithium discovery of this scale.
- The Mines and Minerals (Development and Regulation) Amendment Act, 2023 moved lithium and other critical minerals out of the restricted atomic-minerals list and centralised auction authority with the Union government.

- Auctions for such blocks are conducted through the Ministry of Mines' MSTC e-auction platform.
- Jammu & Kashmir has been a Union Territory since the August 2019 reorganisation, with little prior independent mineral-auction history.
- Reasi district lies in the Jammu division's Shivalik/lower-Himalayan belt, along the Chenab river system.
- Reasi also hosts the 690 MW Salal Hydroelectric Project, on the same river system as the lithium find.
- India's National Critical Mineral Mission (2025) targets reduced import dependence on lithium, cobalt, nickel and rare earth elements.
- Early rounds of critical-mineral block auctions in India, including for this Reasi block, have previously drawn limited bidder interest, reflecting the geological uncertainty inherent in "inferred" (G3-level) resource estimates.

MAINS DIMENSIONS / ANALYSIS

- Centre-Union Territory dynamics: critical-mineral auction authority sitting with the Union government, applied to a Union Territory still rebuilding its post-370 administrative and investment institutions, is a distinct federalism question from auctions in full states.
- Import-substitution strategy: India's near-total reliance on imported lithium, with processing capacity concentrated in a handful of countries, makes domestic discoveries like Reasi strategically significant even at an early, geologically uncertain exploration stage.
- Environmental and livelihood sensitivity: mining in the fragile Himalayan Shivalik belt carries landslide, seismic and watershed-disruption risks requiring environmental-clearance scrutiny distinct from mining in peninsular India's more geologically stable mineral belts.
- Investment-climate challenge: weak bidder interest in early critical-mineral auctions reflects the gap between "inferred" (G3) resource classification and the proven, bankable reserve data investors need — highlighting the importance of follow-on exploration before blocks are auction-ready.
- Way forward: a post-370 investment and employment narrative for Jammu & Kashmir could be built around successfully operationalising Reasi's lithium potential, provided exploration de-risking, environmental safeguards and processing-infrastructure investment accompany the auction process.

LET'S REMEMBER THIS THROUGH A TRICK

One river, two resources: the Chenab powers the **690 MW Salal** hydro project and now sits beside Reasi's **5.9-million-tonne** inferred lithium find — hydropower and critical minerals in the same Himalayan valley.

PYQ LINKAGE

UPSC CSE Prelims 2023 carried a statement-based question on critical minerals used in electric-vehicle and battery technology, including lithium, cobalt and nickel; the exact statement set is not confidently recalled verbatim this edition — verify independently before quoting it, though the critical-minerals theme itself is a well-established, recurring Prelims and Mains topic since 2023.

 PROBABLE PRELIMS MCQ (STATEMENT-BASED)

Q. Consider the following statements regarding India's critical mineral resources:

1. India's first lithium discovery of significant scale was reported in Jammu and Kashmir's Reasi district.
2. The Mines and Minerals (Development and Regulation) Amendment Act, 2023 brought the auction of critical minerals like lithium under the exclusive authority of state governments.
3. A "G3" level resource classification refers to a reconnaissance-level, inferred estimate rather than a proven reserve.

Which of the statements given above is/are correct?

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

Answer: (b). Statement 2 is false — the MMDR Amendment Act, 2023 centralised the auction authority for critical and strategic minerals with the Union government, precisely to accelerate auctions that might otherwise be slowed at the state level.

Critical Minerals

Lithium

Reasi J&K

MMDR Amendment Act 2023

Mining Reform

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