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IMPORTANT INSIGHTS

Election Commission Dissent Row Raises Questions Over Collective Decision-Making, Electoral Roll Governance and Institutional Accountability

Recent Developments:

- Recent reports in September 2026 have highlighted **formal objections** by **Election Commissioners Sukhbir Singh Sandhu and Vivek Joshi** regarding several decisions connected with the Special Intensive Revision (SIR) of electoral rolls.
- An *Indian Express* investigation reported that the two Commissioners recorded objections on at least **14 occasions over approximately 10 months**, including concerns relating to voter registration, deletion and restoration of names, Form 6, electoral-roll software and allocation of administrative responsibilities.
- The **Election Commission of India (ECI)** subsequently stated that differing views are part of institutional deliberation and maintained that SIR-related orders and Form 6 changes were ultimately approved unanimously.
- The controversy has therefore renewed attention on **Article 324**, collective decision-making, the statutory majority rule, internal dissent and the institutional independence of the ECI.

Constitutional Framework of the Election Commission:

Article 324 and Constitutional Mandate:

- The **Election Commission of India** is a constitutional body established under **Article 324** of the Constitution.
- Article 324 vests the ECI with the **superintendence, direction and control** of the preparation of electoral rolls and the conduct of elections to Parliament, State Legislatures, and the offices of the President and Vice-President.
- The Constitution provides for a **Chief Election Commissioner (CEC)** and such number of other Election Commissioners as the President may determine, subject to parliamentary law.
- When other Election Commissioners are appointed, the **CEC acts as Chairman** of the Commission; this chairmanship does not by itself create a separate overriding vote.
- The ECI was transformed from a single-member body into a **three-member Commission in 1993**, comprising the CEC and two Election Commissioners. The present institutional design therefore emphasises collective functioning.

Scope of ECI Functions:

- The Commission administers elections to the **Lok Sabha, Rajya Sabha, State Legislative Assemblies, and the offices of President and Vice-President**.
- Its constitutional responsibilities also include maintaining electoral rolls, supervising election processes and enforcing election-related norms such as the **Model Code of Conduct (MCC)**.
- The ECI also exercises **advisory and quasi-judicial functions** in specified matters, including certain post-election disqualification questions and cases involving corrupt electoral practices.

Decision-Making Mechanism Within the ECI:

Chief Election Commissioner and Other Election Commissioners Act, 2023:

- The present statutory framework is contained in the **Chief Election Commissioner and Other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023**, which came into force on 2 February 2024.
- **Section 17** provides that the business of the Election Commission shall be transacted according to the provisions of the Act.
- **Section 18** specifically regulates the disposal of business and provides the mechanism for dealing with differences among Commissioners.

Unanimity and Majority Rule:

- Under **Section 18(1)**, the Commission may regulate its procedure and allocation of business among the CEC and other Election Commissioners only through a **unanimous decision**.
- Under **Section 18(2)**, the Commission should, as far as possible, conduct its business **unanimously**.
- When the CEC and other Election Commissioners differ in opinion, the matter is decided according to the **opinion of the majority**.
- Since the Commission currently has three members, a disputed matter can ordinarily be decided by **two members against one**.
- The statutory framework therefore makes collective decision-making central to the functioning of the Commission rather than assigning unilateral decision-making authority to the CEC.

Supreme Court and Status of Election Commissioners:

T.N. Seshan v. Union of India, 1995:

- The Supreme Court examined the legality of the expansion of the ECI and the appointment of additional Election Commissioners in **T.N. Seshan v. Union of India (1995)**.
- Then CEC **T.N. Seshan** had challenged the appointment of Election Commissioners M.S. Gill and G.V. Krishnamurthy.
- The Supreme Court upheld the multi-member structure and recognised the principle of **collective functioning and majority decision-making** within the Commission.
- The judgment is significant because the CEC's position as Chairman does not convert the Commission into a hierarchical institution in which the CEC alone determines its decisions.
- The constitutional design must therefore be understood through the **institution of the Election Commission as a whole**, rather than through the individual occupying the office of CEC.

CEC as Chairman, Not Sole Decision-Maker:

- The CEC has an important institutional position because the Constitution designates the CEC as Chairman when other Election Commissioners are appointed.
- However, **Section 18 of the 2023 Act** establishes unanimity as the preferred mode and majority decision as the mechanism for resolving disagreement.
- Consequently, the CEC does not possess a statutory **casting vote** that can automatically override the other Commissioners.

Institutional Dissent: Historical Precedents:

T.N. Seshan and Other Commissioners:

- The expansion of the Commission in 1993 was followed by disagreements between **T.N. Seshan, M.S. Gill and G.V. Krishnamurthy**.
- The dispute ultimately reached the Supreme Court, which upheld the multi-member structure and clarified the constitutional position of the Commission.

N. Gopalaswami and Navin Chawla:

- In **2009**, CEC N. Gopalaswami sought the removal of Election Commissioner **Navin Chawla**, citing concerns about his political neutrality.
- The request was not acted upon, and Chawla subsequently became Chief Election Commissioner. The ECI's own historical records confirm their respective tenures in the Commission.

Ashok Lavasa and Model Code of Conduct:

- During the **2019 Lok Sabha election**, Election Commissioner Ashok Lavasa differed from the majority view in several complaints concerning alleged Model Code of Conduct violations.
- Reports stated that Lavasa sought the inclusion of his minority views in the Commission's orders.
- The Commission decided by **2:1** that such dissent would remain part of its records but would not form part of the final orders in the relevant MCC cases.
- The episode demonstrated the distinction between **internal disagreement, recording of dissent and publication of dissent**.

Current SIR Controversy and Institutional Questions:

Special Intensive Revision of Electoral Rolls:

- The current controversy is closely linked with the **Special Intensive Revision (SIR)** of electoral rolls, which has involved large-scale verification, inclusion, deletion and restoration of voter records.
- According to *Indian Express* reporting, Commissioners Sukhbir Singh Sandhu and Vivek Joshi raised objections concerning **Form 6, voter database access, electoral-roll deletions, restoration of names and appeals relating to electoral-roll decisions**.
- The report also described concerns regarding the increasing centralisation of access to electoral-roll databases and the role of digital systems in implementing roll revisions.
- These issues are constitutionally significant because **Article 324** places the preparation and supervision of electoral rolls within the ECI's institutional mandate.

ECI's Position:

- The ECI has disputed the interpretation that the reported objections demonstrate a breakdown of Commission decision-making.
- Its position is that **differing views during deliberation are normal**, while final SIR decisions were taken with the approval of the Commission.
- The distinction is important for UPSC analysis: an **internal observation or objection is not automatically equivalent to a dissenting final decision**.
- Similarly, the existence of disagreement during deliberation does not by itself establish that the final statutory decision was invalid.

Why Institutional Dissent Matters:

Constitutional Accountability:

- Internal dissent can provide an **institutional check** within a constitutional body by placing alternative legal, administrative or operational views on record.
- Recording disagreement can help identify potential problems before a final decision is implemented.
- Majority rule simultaneously ensures that disagreement does not permanently prevent the Commission from functioning.

Transparency and Institutional Legitimacy:

- A credible electoral institution requires both **effective decision-making and transparent institutional procedures**.
- Where decisions affect voter registration, deletion or restoration, procedural clarity becomes especially important because electoral rolls directly determine access to the electoral process.
- The central issue is therefore not whether Commissioners may disagree, but whether the disagreement is handled through the **constitutional and statutory decision-making framework**.

Electoral Roll Governance:

- Electoral-roll revision requires a balance between **accuracy and inclusion**.
- Removal of duplicate, deceased or otherwise ineligible entries can improve roll integrity, while inadequate verification mechanisms can create risks for eligible voters.
- Digital systems can improve efficiency and auditability, but their design must remain consistent with the statutory authority of designated electoral officials.
- The current SIR debate therefore connects **Article 324, electoral integrity, administrative accountability, digital governance and the right to participate in elections**.

UPSC Relevance:

GS Paper II:

- **Constitutional Bodies:** Election Commission of India, Article 324, institutional independence.
- **Polity and Governance:** Collective decision-making, majority rule, accountability and transparency.
- **Judiciary:** T.N. Seshan v. Union of India and judicial interpretation of the multi-member ECI.
- **Electoral Reforms:** Electoral-roll management, voter inclusion, deletion procedures and institutional safeguards.
- **Democratic Governance:** Balancing electoral integrity with protection against wrongful exclusion.

Key Constitutional and Legal Provisions:

- **Article 324:** Superintendence, direction and control of elections and electoral rolls.
- **Article 325:** One general electoral roll and prohibition of exclusion on specified grounds.
- **Article 326:** Elections to Lok Sabha and State Assemblies based on adult suffrage.
- **2023 Act, Section 17:** Transaction of business of the ECI.
- **2023 Act, Section 18:** Unanimous decision-making as far as possible and majority rule in case of disagreement.

Value Addition for UPSC:

Mains Analytical Framework:

- **Constitutionalism:** Institutional power must operate through constitutionally prescribed procedures rather than individual authority.
- **Checks and Balances:** Internal disagreement can operate as an institutional safeguard when properly recorded and resolved.
- **Electoral Integrity:** Clean electoral rolls require both removal of ineligible entries and protection against wrongful exclusion.
- **Due Process:** Electoral-roll decisions affecting citizens should be supported by clear procedures, notice, verification and opportunities for correction or appeal.
- **Institutional Independence:** The credibility of the ECI depends not only on formal constitutional status but also on transparent, rule-based and collectively accountable functioning.
- **Digital Governance:** Centralised electoral databases require strong access controls, audit trails, statutory accountability and mechanisms for correcting technological errors.
- **UPSC Core Insight:** The ECI is constitutionally designed as a **Commission**, while the CEC serves as its Chairman; the 2023 statutory framework prefers unanimity but expressly provides for majority decision-making when Commissioners differ.

AFSPA Extended in Northeast for Six Months, Renewing Debate on Internal Security, Federalism and Human Rights

Recent Developments:

- The **Ministry of Home Affairs** has extended the application of the **Armed Forces (Special Powers) Act, 1958 (AFSPA)** in specified areas of **Manipur, Nagaland and Arunachal Pradesh** for another 6 months from **1 October 2026**, unless withdrawn earlier.
- In **Manipur**, the entire State remains a disturbed area except areas under **13 police stations** in 5 districts, including Imphal West, Imphal East, Thoubal, Bishnupur and Kakching.
- In **Nagaland**, AFSPA continues in **9 districts** and specified areas under **21 police stations** in 5 additional districts.
- In **Arunachal Pradesh**, the Act continues in **Tirap, Changlang and Longding districts**, along with specified areas under 3 police stations in Namsai district.
- The extension follows a periodic review of the **law-and-order situation**, illustrating the statutory link between AFSPA and the declaration of an area as a “**disturbed area**”.

AFSPA: Constitutional and Legal Framework:

Origin and Purpose:

- The **Armed Forces (Special Powers) Act, 1958** was enacted to confer specified powers upon members of the armed forces operating in areas declared as **disturbed areas**.
- The Act is administered by the **Ministry of Home Affairs** and was enacted on **11 September 1958**.
- AFSPA is a statutory framework for deploying the armed forces **in aid of civil power** in areas affected by serious disturbance or insurgency; it does not transfer ordinary civil administration to the armed forces.

Declaration of a Disturbed Area:

- **Section 3** empowers the **Governor of a State, Administrator of a Union Territory or the Central Government** to declare the whole or part of a State or Union Territory as a disturbed area when the area is in such a disturbed or dangerous condition that the use of armed forces in aid of civil power is considered necessary.
- The declaration is made through a notification in the **Official Gazette**, and the present Northeast notifications specify a definite period subject to earlier withdrawal.

Special Powers and Legal Safeguards:

Powers under Section 4:

- In a disturbed area, specified armed forces personnel may, after giving due warning where required, **use force, including force causing death**, against persons acting in contravention of specified laws or orders concerning prohibited assemblies, weapons, firearms, ammunition or explosives.
- The Act also permits **arrest without warrant, search without warrant** and the destruction of arms dumps, fortified positions, shelters or structures used as training camps or hideouts, subject to statutory conditions.

Arrest and Accountability:

- **Section 5** requires a person arrested under the Act to be handed over to the officer in charge of the nearest police station with the least possible delay, together with a report explaining the circumstances of arrest.
- **Section 6** requires prior sanction of the Central Government before prosecution, suit or other legal proceedings can be instituted against a person for anything done or purported to be done under the Act.
- The Supreme Court has clarified that this protection does not amount to absolute immunity because the statutory protection operates through the requirement of **prior sanction**, which remains subject to judicial review.

Supreme Court's Position on AFSPA:

Naga People's Movement of Human Rights v. Union of India, 1997:

- In **Naga People's Movement of Human Rights v. Union of India, 1997**, the Supreme Court upheld the constitutional validity of AFSPA while examining its relationship with fundamental rights and the federal distribution of legislative powers.
- The Court clarified that the armed forces deployed under AFSPA **assist the civil power rather than replace or supplant it**.
- The powers under AFSPA permit functions such as search, seizure and arrest, while investigation, prosecution, trial and other components of the criminal justice system remain with the **civilian authorities and State criminal justice machinery**.
- The Court also required compliance with operational safeguards, including restrictions against excessive force, harassment of civilians and improper treatment of women and children.
- Complaints concerning misuse or abuse of AFSPA powers must be properly investigated, and where allegations are established, appropriate action and compensation mechanisms should follow.

Why Does Insurgency Persist in Parts of Northeast India?

Historical and Political Factors:

- Several Northeast communities possess distinctive **ethnic, linguistic, cultural and historical identities**, and post-independence integration generated demands for greater autonomy and political recognition.
- Insurgency has therefore involved a combination of **identity-based mobilisation, demands for autonomy, territorial claims and political alienation** rather than a single uniform cause.

Economic and Developmental Factors:

- Perceived **economic marginalisation, unemployment, inadequate infrastructure and uneven development** have contributed to grievances in some areas.
- Difficult terrain and connectivity constraints have historically complicated the delivery of public services and integration with wider national markets.

International Borders and Cross-Border Networks:

- The Northeast shares international borders with **Myanmar, Bangladesh, Bhutan and China**, creating strategic challenges involving difficult terrain, illegal movement, arms trafficking and cross-border insurgent networks.
- Porous sections of international borders have historically provided opportunities for militant groups to obtain **safe havens, logistical support and weapons**.

Migration and Demographic Change:

- Migration has generated concerns in some States regarding **land, employment, political representation, demographic change and cultural identity**.
- These concerns can interact with ethnic mobilisation and intensify local political tensions.

Arguments Supporting AFSPA:

Operational and Security Considerations:

- AFSPA provides **operational flexibility** to security forces confronting armed insurgency and serious security threats.
- Powers relating to search, arrest and use of force can enable rapid action where conventional policing capacity is considered insufficient.
- The statutory framework provides legal protection to personnel performing difficult **counter-insurgency operations**, while remaining subject to statutory and judicial safeguards.
- AFSPA is linked to the declaration of a **disturbed area**, allowing the Union Government to periodically review the geographical and temporal extent of its application.

Concerns Associated with AFSPA:

Human Rights and Accountability:

- Critics have raised concerns that extensive operational powers can create risks of **excessive use of force, arbitrary detention and violations of fundamental rights**.

- The prior-sanction requirement under Section 6 has generated concerns regarding effective criminal accountability for alleged abuses.

Civil-Military Relations and Federalism:

- **Public order** is primarily a State subject under the Seventh Schedule, while deployment of Union armed forces and national security fall within the Union domain.
- AFSPA therefore raises questions regarding the appropriate balance between **State police authority, Union security responsibilities and federalism**.
- The Supreme Court's interpretation makes clear that armed forces operating under AFSPA do not replace the State's civilian criminal justice machinery.

Alienation and Long-Term Security:

- Prolonged military deployment can create **mistrust between local communities and security forces**, particularly where allegations of abuse remain unresolved.
- Consequently, counter-insurgency policy requires security operations to be accompanied by **political dialogue, development, effective governance and grievance redressal**.

Major Committees and Reform Recommendations:

Justice B. P. Jeevan Reddy Committee, 2005:

- The committee recommended **repealing AFSPA** and incorporating its essential provisions into the **Unlawful Activities (Prevention) Act, 1967**, along with safeguards and grievance-redressal mechanisms.

Second Administrative Reforms Commission, 2007:

- The **Second Administrative Reforms Commission**, headed by Veerappa Moily, also recommended repeal of AFSPA and supported an alternative legal framework incorporating necessary safeguards while addressing security requirements.

Justice Santosh Hegde Commission, 2013:

- The Commission examined alleged extrajudicial killings in Manipur and highlighted concerns regarding the **accountability of security forces and alleged misuse of AFSPA**.
- Its findings strengthened the debate over independent investigation, accountability and safeguards in counter-insurgency operations.

UPSC Relevance:

General Studies Paper II:

- **Polity:** Federalism, fundamental rights, constitutional safeguards, Union-State relations.
- **Governance:** Accountability, transparency, grievance redressal and civilian oversight.
- **Constitutional Issues:** Legislative competence, fundamental rights and judicial review of security legislation.

General Studies Paper III:

- **Internal Security:** Insurgency, counter-insurgency, border management and security forces.
- **Northeast India:** Ethnic conflict, connectivity, development deficit, cross-border militancy and peace processes.
- **Security-Governance Linkage:** Long-term internal security requires a combination of security operations, political engagement and development.

Value Addition for UPSC:***Key Constitutional and Legal Points:***

- **Article 14:** Equality before law and equal protection of laws remain relevant to the exercise of extraordinary statutory powers.
- **Article 19:** Restrictions on specified freedoms must operate within the constitutional framework.
- **Article 21:** Protection of life and personal liberty remains relevant to arrests, use of force and allegations of excessive action.
- **Article 246 and Union List:** The Supreme Court in the 1997 judgment recognised Parliament's legislative competence to enact AFSPA in the context of deployment of armed forces in aid of civil power.
- **Seventh Schedule:** AFSPA illustrates the interaction between Union responsibilities relating to defence and armed forces and State responsibilities relating to public order and policing.
- **UPSC Core Insight:** AFSPA represents the constitutional challenge of balancing **national security, operational effectiveness, fundamental rights, federalism and democratic accountability**; therefore, its continuation requires periodic security assessment together with effective safeguards, civilian oversight and mechanisms for addressing legitimate grievances.

Poompuhar Excavations Reveal Ancient Tamilakam's Maritime Links with West Asia and Wider Indian Ocean Trade Networks**Recent Developments:**

- The **Tamil Nadu State Department of Archaeology**, in collaboration with the **Indian Maritime University**, conducted the third phase of underwater archaeological exploration off **Poompuhar in Mayiladuthurai district, Tamil Nadu**, during September 2026.
- The exploration recovered a **fragment of a West Asian torpedo jar**, more than **250 ceramic fragments including glazed ware**, and **4 terracotta ring wells** from an underwater area covering nearly 2 square kilometres.
- The torpedo-jar fragment is significant because such vessels were used to transport **liquid commodities such as wine and oil** through western Indian Ocean maritime routes, strengthening evidence of Poompuhar's commercial links with **West Asia and the Mediterranean world**.
- The ring wells found on the seabed may indicate the presence of a **palaeochannel**, suggesting that parts of the ancient settlement and its landscape were subsequently submerged because of coastal changes and erosion.
- The exploration is important for understanding **ancient Indian maritime trade, coastal archaeology, Chola history and the integration of Tamilakam into wider Indian Ocean networks**.

Poompuhar: Historical and Geographical Significance:

Location and Historical Importance:

- **Poompuhar**, also known as **Kaveripoompattinam** or **Kaveripattinam**, was an important early Chola port situated at the **mouth of the Cauvery River**, where the river meets the Bay of Bengal.
- The settlement occupied an important position on the **Coromandel Coast**, providing access to maritime routes across the Bay of Bengal and the wider Indian Ocean.
- **Sangam and post-Sangam literature** portray Poompuhar as a major commercial centre frequented by merchants from different parts of India and Southeast Asia.
- The city was traditionally described through **Maruvurppakkam**, located near the seashore, **Pattinappakkam**, located towards the west, and **Nalangadi**, situated between the two.
- Literary and archaeological evidence together indicate that Poompuhar functioned as an important centre of **commerce, craft production, maritime exchange and urban activity**.

Archaeological Evidence:

- Earlier underwater investigations had already indicated that the ancient habitation extended beyond the present shoreline, while recent excavations have added material evidence for its wider maritime connections.
- The discovery of a **West Asian torpedo-jar fragment** provides material evidence that complements literary references to Poompuhar's overseas commercial activity.
- The recovery of **ring wells, pottery and structural remains** is also important for reconstructing the ancient settlement, freshwater management and changing coastal landscape.
- The Government of India had permitted the Tamil Nadu State Department of Archaeology to undertake exploration at Poompuhar in 2025; a Lok Sabha reply in March 2026 stated that the report of that work had not yet been submitted at that time.

Poompuhar and Ancient Indian Ocean Trade:

West Asian and Mediterranean Connections:

- The **torpedo jar** is an important archaeological indicator because these vessels were associated with the transportation of liquid cargo across western Indian Ocean routes.
- Its presence at Poompuhar supports the interpretation that Tamilakam participated in maritime exchanges extending towards **West Asia, the Persian Gulf and the Mediterranean-linked trade system**.
- The evidence demonstrates that ancient Indian maritime commerce involved not only coastal exchange but also **long-distance transoceanic networks**.

Southeast Asian Connections:

- Poompuhar's geographical position on the eastern coast facilitated connections with **Sri Lanka, Southeast Asia and other Bay of Bengal trading centres**.
- Literary evidence describes the movement of commodities and merchants between Poompuhar and regions associated with present-day **Southeast Asia**.
- These networks contributed to the movement of **goods, people, cultural practices, religious ideas and technologies** across the Indian Ocean.

Maritime Trade of Major Ancient Indian Powers:

Mauryan Empire:

- The **Mauryan Empire** developed extensive internal and external trade networks connecting different regions of the subcontinent with maritime centres.
- The **Arthashastra** refers to the **Navadhyaksha**, an official associated with waterways and shipping, indicating state attention to maritime activity and regulation.

Satavahanas:

- The **Satavahanas** played an important role in trade connecting the **Deccan with the western coast**.
- Ports such as **Kalyan, Sopara and Bharukachcha** facilitated commercial exchanges with western Indian Ocean and Roman trading networks.

Cheras:

- The **Muziris** region on the Malabar Coast emerged as an important centre of overseas commerce.
- The **Periplus of the Erythraean Sea** and Sangam literature provide evidence of maritime trade involving the Chera realm, particularly in commodities such as **pepper and other high-value goods**.

Pandyas:

- The **Pandyan kingdom** participated in Indian Ocean commerce through ports such as **Korkai**, which was particularly associated with the **pearl fisheries of the Gulf of Mannar**.
- Korkai therefore illustrates the relationship between **maritime trade, coastal resources and specialised commodity production**.

Western Kshatrapas:

- The **Western Kshatrapas** controlled parts of western India and participated in **Arabian Sea trade** through important commercial centres of Gujarat and the western Deccan.

Pallavas:

- The **Pallavas** maintained maritime and cultural connections from the eastern coast with **Southeast Asia**, particularly regions corresponding to present-day Cambodia and mainland Southeast Asia.
- These links demonstrate that maritime commerce also facilitated wider **cultural transmission and political interaction**.

Other Important Ancient Indian Ports:

Western and Southern Coast:

- **Muziris:** An important Malabar Coast centre associated with trade across the Arabian Sea and contacts with the Roman world.
- **Bharuch:** Located on the Narmada and known as **Broach**, it became an important western Indian commercial centre connected with inland and maritime trade.
- **Korkai:** A major Pandyan port associated with the **Gulf of Mannar pearl fisheries**.

Eastern Coast:

- **Arikamedu:** Located near present-day Puducherry, it has yielded archaeological evidence of **Indo-Roman commercial connections**.

- **Tamralipti:** Located in present-day West Bengal, it was an important eastern maritime centre connecting India with both western and eastern trading regions.
- **Kaveripattinam:** The port of Poompuhar served as an important centre for trade with **Southeast Asia and the Far East**; NCERT material also identifies it as a major centre for merchandise handling and shipbuilding.

Maritime Trade as a Driver of Ancient India's Prosperity:

Economic and Urban Impact:

- Overseas trade generated **wealth, customs revenue and wider markets** for Indian agricultural, craft and luxury goods.
- Major ports developed into **urban commercial centres**, attracting merchants, artisans, sailors and specialised service providers.
- Foreign demand encouraged specialised production of **textiles, spices, beads, ceramics, pearls and metal goods**.
- Rulers benefited through **customs duties, port taxes and regulation of commercial activity**.

Cultural and Technological Impact:

- Maritime networks facilitated the movement of **religions, art, languages, ideas and technologies** across the Indian Ocean.
- Sustained maritime commerce encouraged advances in **shipbuilding, navigation and knowledge of seasonal monsoon winds**.
- NCERT notes the ancient Indian tradition of **stitched shipbuilding**, in which wooden planks were joined using cords rather than nails, demonstrating technological adaptation to Indian Ocean sailing conditions.

Underwater Archaeology and Changing Coastal Landscapes:

Archaeological Significance:

- Poompuhar demonstrates how **underwater archaeology** can supplement literary and terrestrial archaeological evidence for reconstructing ancient Indian history.
- The discovery of structures and ring wells below the present sea level suggests that archaeological interpretation must consider **coastal erosion, changing shorelines, palaeochannels and sea-level changes**.
- Modern investigations use technologies such as **side-scan sonar, echo sounders and other seabed-survey techniques** to identify submerged archaeological features before targeted excavation.

Broader Historical Significance:

- Poompuhar provides a case study of how ancient Indian coastal settlements were simultaneously **economic centres, cultural interfaces and nodes in international trade networks**.
- Its archaeological record helps connect **Sangam literature with material evidence**, strengthening the multidisciplinary study of early historic South India.
- The continuing exploration also demonstrates the importance of protecting submerged cultural heritage from **coastal erosion and changing marine conditions**.

UPSC Relevance:

General Studies Paper I:

- **Ancient Indian History:** Sangam Age, early Cholas, Cheras, Pandyas and ancient urban centres.
- **Indian Culture:** Maritime heritage, literature, archaeological sources and cultural exchanges.
- **Geography:** Coastal geomorphology, palaeochannels, erosion and changing shorelines.
- **World History Linkage:** Ancient Indian Ocean networks and India's commercial connections with West Asia, the Mediterranean and Southeast Asia.

Prelims Focus:

- **Poompuhar:** Early Chola port on the Cauvery–Bay of Bengal interface.
- **Korkai:** Pandyan port associated with pearl fisheries.
- **Muziris:** Major Malabar Coast trading centre.
- **Arikamedu:** Important archaeological site associated with Indo-Roman trade.
- **Tamralipti:** Major eastern maritime centre.
- **Arthashastra:** Reference to **Navadhyaksha** in the context of waterways and shipping.
- **Periplus of the Erythraean Sea:** Important source for ancient Indian Ocean commercial networks.

Value Addition for UPSC:

Analytical Framework:

- **Archaeology + Literature:** Poompuhar shows how archaeological material can corroborate and contextualise evidence from Sangam and pōst-Sangam literature.
- **Indian Ocean World:** Ancient India was an active participant in a wider maritime system linking **South Asia, West Asia, the Mediterranean and Southeast Asia**.
- **Economic History:** Ports functioned as nodes connecting production centres, inland markets and overseas consumers.
- **Cultural Diffusion:** Maritime trade facilitated the circulation of **commodities, technologies, languages, religions and cultural practices**.
- **Environmental History:** The submergence of parts of Poompuhar highlights the role of **coastal erosion, palaeochannels and changing shorelines** in shaping human settlements.
- **UPSC Core Insight:** Poompuhar demonstrates that ancient India's maritime economy was not an isolated coastal phenomenon but an interconnected system in which **ports, inland production centres, merchant networks, monsoon navigation and overseas markets** collectively supported economic and cultural exchange across the Indian Ocean.

River Interlinking Debate Highlights India's Water Security Challenge, Inter-State Disputes and Cooperative Federalism

Recent Developments:

- The **31st Southern Zonal Council meeting**, chaired by Union Home Minister Amit Shah at Mahabalipuram, Tamil Nadu, on **20 August 2026**, highlighted the need for faster resolution of pending water disputes among



southern States through dialogue involving the concerned States, Ministry of Jal Shakti, Ministry of Home Affairs and the Inter-State Council.

- The Union Home Minister also proposed linking major rivers from the **Brahmaputra to the Godavari and Cauvery** as a long-term water-security approach, while arguing that interconnected waterways could also support transportation. This was a policy proposal, not the announcement of a single approved Brahmaputra–Cauvery project.
- The discussion gained significance because southern India continues to face disputes involving the **Cauvery, Krishna, Pennaiyar, Mokedatu and Mullaperiyar** river systems, demonstrating that water scarcity is simultaneously a geographical, ecological, legal and federal issue.

Interlinking of Rivers: Concept and Objectives:

What is River Interlinking?

- **Interlinking of Rivers (ILR)** involves transferring water between river basins through canals, reservoirs, tunnels and diversion structures after assessing the water balance and requirements of the concerned basins.
- The underlying objective is to reduce **spatial and temporal variations in water availability** by transferring water from identified surplus basins to water-deficit regions.
- The approach seeks to expand irrigation, improve drinking-water availability, moderate floods and droughts, generate hydropower and support regional development. The National Water Development Agency estimates that the complete ILR programme could provide substantial additional irrigation and hydropower benefits.

Historical Evolution and Institutional Framework:

- The idea of large-scale river interlinking has evolved through several proposals, including **Sir Arthur Cotton's** nineteenth-century irrigation and navigation ideas and later proposals for inter-basin transfers.
- The Government formulated the **National Perspective Plan (NPP) in 1980** for transferring water between river basins and reducing regional imbalances. It has two components: **Peninsular Rivers Development** and **Himalayan Rivers Development**.
- The NPP identifies **30 links**, comprising **16 Peninsular links and 14 Himalayan links**.
- The **National Water Development Agency (NWDA)** was established in July 1982 to undertake surveys, water-balance studies and feasibility assessments for river-linking projects; its mandate was subsequently expanded to cover the Himalayan component and preparation of DPRs.

Major River-Linking Projects and Examples:

Existing or Operational Inter-Basin Transfers:

- **Mullaperiyar Project:** Water from the Periyar basin in Kerala is diverted towards the Vaigai basin in Tamil Nadu, supporting irrigation and drinking-water requirements in parts of Tamil Nadu.
- **Parambikulam–Aliyar Project:** This multi-reservoir system transfers water between river basins involving Kerala and Tamil Nadu and demonstrates the importance of inter-State agreements in implementing complex water-transfer projects.
- **Krishna Water Supply Project:** Krishna-basin water is transferred to meet the drinking-water requirements of **Hyderabad**, demonstrating the role of inter-basin transfers in urban water security.
- **Indira Gandhi Canal:** Water from the **Sutlej–Beas system** is carried towards north-western Rajasthan, substantially expanding irrigation and agricultural activity in an otherwise arid region.

Current Priority Links:

- The **Ken–Betwa Link Project** is the first river-linking project under implementation under the NPP and is planned for completion by March 2030.
- The **Godavari–Cauvery Link Project** consists of three proposed link systems and has been under consultation among the concerned States; draft DPR and draft agreement processes have been undertaken.
- The wider Peninsular component envisages links involving the **Mahanadi, Godavari, Krishna, Pennar and Cauvery**, making it particularly relevant to southern India's long-term water-management debate.

Arguments Supporting River Interlinking:***Water Security and Regional Balancing:***

- Inter-basin transfers can increase water availability in **drought-prone and water-deficient regions**, particularly where local water resources are insufficient to meet irrigation and drinking-water requirements.
- The proposed **Ken–Betwa Link** illustrates this approach by targeting irrigation and water-supply benefits in Bundelkhand, a region historically affected by water stress.

Agricultural and Economic Benefits:

- Additional irrigation can increase agricultural productivity, encourage **crop diversification**, reduce dependence on erratic rainfall and support rural incomes.
- Large infrastructure projects can also generate employment and stimulate associated activities such as construction, transport, irrigation services and hydropower.

Flood and Drought Management:

- Storage and diversion structures can potentially moderate **flood peaks** and transfer part of the stored water towards deficit regions.
- However, such benefits depend on basin-specific hydrology, reservoir capacity, ecological flows and the actual availability of transferable water.

Urban, Industrial and Navigation Benefits:

- Inter-basin transfers can supplement water supplies for **urban centres and industries** facing local shortages.
- Integrated water infrastructure can also support inland navigation where suitable waterways and storage systems exist.

Major Concerns and Limitations:***Ecological and Hydrological Risks:***

- River ecosystems depend on natural flow regimes, sediment transport, seasonal flooding and ecological connectivity; altering these processes can affect **aquatic biodiversity, wetlands, groundwater recharge and downstream ecosystems**.
- The concept of a permanently “surplus” basin is also increasingly questioned because river flows vary seasonally and are affected by climate variability.
- Climate change can alter **rainfall patterns, drought frequency, glacier behaviour and river discharge**, making long-term water-balance assumptions uncertain.

Inter-State Water Disputes:

- River waters are shared resources, and transferring water across basins can create new disputes if the source or recipient States disagree over the definition of surplus water.
- The **Pennaiyar dispute** illustrates the difficulty of resolving questions concerning historical agreements, water utilisation and tribunal mechanisms.
- The **Mekedatu Project**, proposed by Karnataka on the Cauvery, has faced opposition from Tamil Nadu because of concerns over downstream water availability.

Federal and Legal Challenges:

- Water is primarily a **State subject**, but inter-State rivers require institutional coordination between States and the Union Government.
- **Article 262** provides the constitutional framework for adjudication of disputes relating to waters of inter-State rivers and river valleys.
- The **Inter-State River Water Disputes Act, 1956** provides for adjudication through water disputes tribunals when disputes cannot be settled through negotiations.
- Delays in negotiations, tribunal processes, implementation and compliance can prolong disputes and reduce confidence in large inter-State projects.

Social and Rehabilitation Challenges:

- Large dams, reservoirs and canals can require substantial land acquisition and may affect **tribal communities, farmers, forests and settlements**.
- Rehabilitation and resettlement must therefore address not only physical displacement but also livelihood loss, common-property resources and cultural ties with land.

Financial and Technical Constraints:

- River-linking requires extensive **capital investment, land acquisition, engineering infrastructure and long-term maintenance**.
- Long gestation periods and complex clearances can increase project costs and delay expected benefits.

Demand-Side Management: The Missing Complement:

Why Supply Augmentation Alone Is Insufficient:

- India's water challenge is not simply a shortage of physical water; it also involves **inefficient irrigation, groundwater depletion, pollution, leakage, uneven distribution and weak demand management**.
- Large inter-basin transfers should therefore complement, rather than replace, **water conservation and efficient utilisation**.
- Priority measures include **micro-irrigation, rainwater harvesting, watershed development, groundwater recharge, wastewater reuse and restoration of traditional water bodies**.

Basin-Level Water Governance:

- Water planning should increasingly move from isolated projects towards **Integrated River Basin Management**, considering surface water, groundwater, ecological flows, agriculture, urban demand and climate risks together.

- NWDA itself undertakes basin-level water-balance studies to determine whether water can be transferred after meeting the reasonable needs of the source basin.

Way Forward:

Strengthen Cooperative Federalism:

- The **Zonal Councils** provide an institutional platform for dialogue on common inter-State and Centre–State issues and can support political consensus before disputes become prolonged legal conflicts.
- Regular joint meetings involving States, the **Inter-State Council, Ministry of Jal Shakti and technical institutions** can improve information sharing and facilitate negotiated settlements.

Adopt a Scientific and Climate-Resilient Approach:

- Every proposed link should undergo rigorous **hydrological assessment, environmental impact assessment, climate-risk analysis and cumulative basin-level assessment**.
- Transfer decisions should be based on scientifically established water availability rather than static assumptions of permanent surplus and deficit.

Combine Supply-Side and Demand-Side Solutions:

- River linking should be integrated with **watershed management, groundwater regulation, efficient irrigation, rainwater harvesting and wastewater reuse**.
- The objective should be to improve water productivity and resilience rather than merely increase the volume of water supplied.

Ensure Participatory and Equitable Governance:

- Affected States, local communities, farmers, environmental experts and other stakeholders should participate in project planning.
- **Rehabilitation, ecological-flow protection and benefit sharing** should be treated as integral components of project design rather than post-project measures.

Conclusion:

River interlinking can provide **location-specific benefits** for irrigation, drinking water and regional water security, but it cannot by itself resolve India's complex water crisis. The Brahmaputra–Godavari–Cauvery idea has renewed attention on large-scale inter-basin transfers, while disputes such as Pennaiyar, Cauvery and Mokedatu demonstrate that water security also depends on **cooperative federalism, legal certainty, ecological sustainability and efficient demand management**. India's long-term strategy therefore requires a balanced combination of carefully assessed water-transfer projects, conservation, groundwater management and basin-level governance.

Value Addition for UPSC:

- **GS-I:** Drainage systems, river basins, monsoon variability, droughts, floods and regional geography.
- **GS-II:** Cooperative federalism, Article 262, Inter-State River Water Disputes Act, Zonal Councils and Centre–State relations.
- **GS-III:** Irrigation, water-resource management, climate change, environmental impacts and sustainable agriculture.

- **Prelims Facts:** NPP — 1980; NWDA — 1982; 30 NPP links — 16 Peninsular + 14 Himalayan; Ken-Betwa — first NPP link under implementation.
- **Core UPSC Insight:** *India's water-security challenge is not only about moving more water; it is also about managing existing water more efficiently, equitably and sustainably.*

India's Nuclear Expansion Raises Long-Term Challenges of Radioactive Waste Management, Financing and Institutional Responsibility

Recent Developments:

- India's **Nuclear Energy Mission** aims to raise nuclear power capacity to **100 GW by 2047**, increasing the role of nuclear energy as a reliable, low-carbon baseload source while supporting the Net Zero target for 2070. The expansion also envisages wider participation of the private sector.
- The **SHANTI Act, 2025** has enabled wider public and private participation in the nuclear power sector while modernising the legal framework for nuclear energy, safety and liability. Sensitive nuclear fuel-cycle activities continue to remain under sovereign control.
- As of 2026, India's installed nuclear power capacity was **8.78 GW**, with the government roadmap targeting about **22 GW by 2031–32** and 100 GW by 2047. The roadmap envisages contributions from NPCIL, other public-sector entities, private companies and joint ventures.
- The expansion of nuclear capacity increases the importance of **spent-fuel management, radioactive-waste conditioning, interim storage, decommissioning and eventual geological disposal** over much longer time horizons than the operating life of individual reactors.

Radioactive Waste Management: Concept and India's Approach:

Closed Fuel Cycle:

- In a conventional **once-through fuel cycle**, nuclear fuel is used in a reactor and the discharged spent fuel is ultimately treated as waste requiring long-term disposal.
- India follows a **closed nuclear fuel cycle**, under which spent fuel is reprocessed to recover uranium and plutonium for further utilisation. The approach is intended to maximise energy extraction from limited uranium resources and support the long-term transition towards thorium utilisation.
- Spent fuel is therefore not treated entirely as waste in the Indian system because it contains **potentially reusable nuclear material**.
- Reprocessing can substantially reduce the volume of high-level waste requiring geological disposal, but it **does not eliminate radioactivity or the need for long-term isolation**. According to the Atomic Energy Regulatory Board, only around 2–3% of reprocessed spent fuel ultimately becomes waste, while the remaining material can be recycled.

Nuclear Fuel and Radioactive-Waste Management Chain:

Cooling and Interim Storage:

- Freshly discharged fuel remains **highly radioactive and thermally hot**, requiring initial cooling in spent-fuel pools followed by appropriate interim storage arrangements.
- Interim storage provides time for radioactive decay, heat reduction and subsequent treatment before final disposal.

Reprocessing:

- Spent fuel can undergo chemical reprocessing to recover **uranium and plutonium**, which can subsequently support further fuel fabrication and the closed fuel cycle.
- Reprocessing also separates high-level radioactive residues from materials that can potentially be reused.

Waste Conditioning:

- Radioactive residues that cannot be reused are converted into **stable and immobilised forms** suitable for storage and disposal.
- High-level liquid radioactive waste can be immobilised through **vitrification**, in which radioactive material is incorporated into a stable glass matrix.
- India has continued to develop high-level waste-management technologies, including an advanced vitrification facility at Tarapur.

Final Disposal:

- **Deep geological disposal** is intended for long-lived high-level radioactive waste that requires isolation from the biosphere over very long periods.
- India's regulatory framework recognises geological disposal as the eventual pathway for high-level waste, while the country continues to undertake technological and geological studies for such facilities.

Geological Repository: Long-Term Solution:***What is a Deep Geological Repository?***

- A **deep geological repository** is an engineered facility designed to isolate long-lived radioactive waste deep underground within stable geological formations.
- Safety depends on a **multi-barrier system**, combining the waste form, engineered containers, surrounding materials and geological formations to prevent radionuclide migration.
- A geological repository differs from an interim storage facility because its primary purpose is **long-term isolation rather than temporary holding**.
- India has considered geological disposal for high-level waste, with repository planning linked to the volume, characteristics and long-term management strategy for radioactive waste.

Why Long-Term Radioactive-Waste Management Matters:***Intergenerational Responsibility:***

- Radioactive waste can remain hazardous for **very long periods**, making its management fundamentally different from conventional industrial waste.
- Present-day nuclear expansion therefore creates responsibilities that may extend across several generations.

Financial Responsibility:

- Waste treatment, long-term storage, reactor decommissioning and geological disposal can generate significant costs **decades after a nuclear plant begins operation**.
- If adequate financial provisions are not created during the operating period, future governments and taxpayers may ultimately bear a disproportionate share of these costs.

Institutional Continuity:

- Nuclear reactors may operate for several decades, whereas radioactive-waste management and monitoring can continue for much longer.
- Responsibility must therefore remain clearly defined even if an operator **changes ownership, exits the sector, becomes financially inactive or shuts down a reactor**.

Emerging Concerns with Private Participation:***Defining Responsibility Across the Fuel Cycle:***

- The expansion of private participation makes it necessary to clearly distinguish the responsibilities of **private operators, public-sector entities, regulators and the government** for spent fuel, radioactive waste, decommissioning and long-term disposal.
- The SHANTI Act enables wider participation while retaining sovereign control over sensitive areas of the nuclear fuel cycle.

Public Acceptance and Environmental Justice:

- Communities may oppose radioactive-waste facilities because of concerns regarding **radiation exposure, environmental safety, land use, property values and long-term ecological risks**.
- Transparent risk communication, independent monitoring and meaningful public consultation are therefore important for social acceptance.

Regulatory Continuity:

- The **Atomic Energy Regulatory Board (AERB)** regulates radioactive-waste management associated with nuclear and radiation facilities and reviews waste management across the lifecycle of nuclear power plants, from siting and construction to operation and decommissioning.
- Radioactive-waste disposal is governed by the **Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987**, under which authorisation is required for disposal.

India's Three-Stage Nuclear Power Programme:***Stage I: Pressurised Heavy Water Reactors:***

- India's three-stage nuclear programme was conceptualised under **Dr Homi Jehangir Bhabha** to maximise energy extraction from limited uranium resources and progressively utilise India's large thorium resources.
- The first stage is based primarily on **Pressurised Heavy Water Reactors (PHWRs)** using natural uranium as fuel and heavy water as moderator and coolant.
- Natural uranium contains predominantly **Uranium-238 (U-238)** with a small fraction of fissile **Uranium-235 (U-235)**.
- A major objective of Stage I is to generate **Plutonium-239 (Pu-239)** from U-238 during reactor operation. Pu-239 subsequently serves as an important fuel for the second stage.
- India's indigenous PHWR programme has become a major component of the current nuclear expansion strategy, including the deployment of **700 MWe PHWRs**.

Stage II: Fast Breeder Reactors:

- The second stage is based on **Fast Breeder Reactors (FBRs)**, which use fast neutrons and are designed to produce more fissile material than they consume.
- The **Prototype Fast Breeder Reactor (PFBR)** at Kalpakkam uses uranium-plutonium mixed-oxide fuel and a U-238 blanket.
- Fast neutrons convert U-238 into **Pu-239**, thereby increasing the availability of fissile material.
- The reactor design can also use **Th-232 in the blanket**, which can be converted through nuclear transmutation into **U-233**, providing the bridge towards the third stage.
- The government has approved pre-project activities for **2 × 500 MW Fast Breeder Reactors** at Kalpakkam based on the PFBR design.

Stage III: Thorium-Based Reactors:

- The third stage seeks to utilise India's substantial **thorium resources** for large-scale nuclear energy generation.
- **Thorium-232 (Th-232)** is fertile rather than fissile; it is converted into fissile **Uranium-233 (U-233)** through neutron irradiation.
- U-233 can subsequently serve as nuclear fuel, creating a thorium-based fuel cycle.
- The **Advanced Heavy Water Reactor (AHWR)** has been developed as an important technology demonstration for this stage, combining thorium-based fuel with advanced safety features.
- The three-stage programme therefore creates a strategic sequence: **natural uranium and PHWRs → plutonium and fast breeders → thorium and U-233**.

Way Forward:***Create Dedicated Financial Provisions:***

- A dedicated **nuclear-waste management fund** can be considered, with contributions linked to electricity generation and accumulated throughout the operating life of nuclear facilities.
- Such provisions can support future **spent-fuel management, transportation, decommissioning, long-term storage and geological disposal** rather than shifting the entire burden to future taxpayers.

Define Private-Sector Obligations:

- Nuclear regulations should clearly specify the **financial, operational and liability responsibilities** of private operators for spent fuel and radioactive waste.
- Contracts and licences should ensure that waste-management obligations remain enforceable even after ownership changes or plant closure.

Begin Early Repository Planning:

- India does not necessarily need immediate large-scale construction of a geological repository, but it should undertake **systematic site identification, geological characterisation, safety assessment, technology development and public consultation** well before disposal becomes necessary.
- Long-term planning is particularly important because geological repositories require extensive scientific assessment and societal consensus.

Apply the Polluter-Pays Principle:

- The costs associated with radioactive waste should be **internalised into the economics of nuclear electricity** rather than being transferred entirely to future generations.
- Financial mechanisms should reflect the full lifecycle cost of nuclear power, including waste management and decommissioning.

Conclusion:

India's nuclear expansion is increasingly linked to **energy security, decarbonisation and long-term technological self-reliance**, but a larger nuclear fleet also creates obligations extending far beyond reactor operation. India's closed fuel cycle reduces the volume of high-level waste and enables recovery of uranium and plutonium, while vitrification and engineered storage provide intermediate management pathways. However, long-lived high-level waste ultimately requires durable isolation. The combination of **private-sector participation, the 100 GW nuclear target, the three-stage nuclear programme and emerging fast-breeder capacity** therefore makes financial provisioning, regulatory continuity, institutional accountability and geological-disposal planning central to India's nuclear policy.

Value Addition for UPSC:

- **GS-I:** Scientific developments, nuclear technology and India's technological evolution.
- **GS-III:** Nuclear energy, energy security, radioactive-waste management, environmental protection and low-carbon development.
- **GS-II:** Regulatory institutions, public accountability, private-sector participation and intergenerational governance.
- **Prelims Facts:** Atomic Energy Commission — 1948; Apsara — 1956; Tarapur Atomic Power Station — 1969; Nuclear Energy Mission — 100 GW by 2047; SHANTI Act — 2025; PFBR — 500 MW; India's nuclear programme — three stages.
- **Conceptual Chain:** PHWR → Pu-239 → FBR → U-233 → Thorium-based third stage.
- **Core UPSC Insight:** *India's nuclear-energy transition is not complete when electricity is generated; responsible nuclear governance extends across the entire fuel cycle, including spent fuel, radioactive waste, decommissioning, financing and final disposal.*

Best Institute for OAS/IAS

QUESTIONS

1. Given below are two statements, one labeled as Assertion (A) and the other labeled as Reason (R):

Assertion (A): The Chief Election Commissioner cannot unilaterally override the decisions or objections raised by other Election Commissioners regarding electoral roll revisions.

Reason (R): Section 18 of the Chief Election Commissioner and Other Election Commissioners Act, 2023 prescribes that when Commissioners differ in opinion, the matter must be decided by a statutory majority vote.

Select the correct answer:

- (A) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are true, but (R) is NOT the correct explanation of (A).
- (C) (A) is true, but (R) is false.
- (D) (A) is false, but (R) is true.

2. Consider the following statements regarding internal security and federal division of powers in India:

Statement 1: Parliament possesses the exclusive legislative competence to enact laws authorizing the deployment of Union armed forces in aid of civil power in any State.

Statement 2: "Public Order" and "Police" are subjects enumerated under List II (State List) of the Seventh Schedule of the Constitution of India.

Which one of the following is correct in respect of the above statements?

- (A) Both Statement 1 and Statement 2 are correct, and Statement 2 is the correct explanation for Statement 1.
- (B) Both Statement 1 and Statement 2 are correct, but Statement 2 is NOT the correct explanation for Statement 1.
- (C) Statement 1 is correct, but Statement 2 is incorrect.
- (D) Statement 1 is incorrect, but Statement 2 is correct.

3. Consider the following statements regarding the historical, administrative, and archaeological dimensions of ancient Indian ports and maritime trade:

- (1) Torpedo jars found at Indian Ocean ports are distinct ceramic indicators of maritime cargo exchange specifically associated with West Asian and Persian Gulf trade routes.
- (2) The Arthashastra references an official designated as Navadhyaksha, who was primarily responsible for regulating maritime customs, waterways, and shipping.
- (3) The Sangam literary tradition describes Kaveripoompattinam as being divided into distinct functional urban sectors, including Maruvurpakkam (coastal/harbor area) and Pattinappakkam (inland residential/city area).
- (4) In the traditional Indian Ocean shipbuilding technique known as stitched-plank construction, iron nails were extensively used to bind wooden planks to resist monsoon waves.

How many of the above statements are correct?

- (A) Only one
- (B) Only two
- (C) Only three

(D) All four

4. With reference to various inter-basin water transfer projects and inter-state river systems in India, consider the following statements:

- (1) The Mullaperiyar dam diverts water from the west-flowing Periyar river basin in Kerala to the east-flowing Vaigai basin in Tamil Nadu.
- (2) The Indira Gandhi Canal carries water from the confluence of the Sutlej and Beas rivers at Harike Barrage to feed the arid regions of north-western Rajasthan.
- (3) The Parambikulam–Aliyar Project is a multi-reservoir inter-state project that transfers water between Kerala and Tamil Nadu.
- (4) The proposed Mekedatu balancing reservoir project is situated on the Pennaiyar River near its confluence with the Palar River in Karnataka.

Which of the statements given above are correct?

- (A) 1 and 4 only
- (B) 1, 2 and 3 only
- (C) 2 and 3 only
- (D) 1, 2, 3 and 4

5. Consider the following major nuclear power stations in India:

- (1) Narora Atomic Power Station
- (2) Rawatbhata Atomic Power Station
- (3) Tarapur Atomic Power Station
- (4) Kaiga Generating Station
- (5) Kudankulam Nuclear Power Plant

Arrange the above nuclear power plant locations in geographical order from North to South across India:

- (A) 2 — 1 — 3 — 4 — 5
- (B) 1 — 2 — 4 — 3 — 5
- (C) 2 — 1 — 4 — 3 — 5
- (D) 1 — 2 — 3 — 4 — 5

ANSWER KEY

1 – Answer (A), 2 – Answer (B), 3 – Answer (C), 4 – Answer (B), 5 – Answer (D)



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