info@rpmias.com

ASPIRE with RAM IAS

Guiding Dreams, Empowering Future

By DR. V. RAM PRASATH MANOHAR, IAS

Weekly Current Affairs Compilation for UPSC TNPSC KPSC

3RD WEEK | JULY-2026

EXCLUSIVE CURRENT AFFAIRS BULLETIN

INDIA-NEW ZEALAND STRATEGIC PARTNERSHIP

ROADMAP TO 2030

Why in News?

The Prime Minister of India paid a historic official visit to New Zealand in July 2026, the first by an Indian Prime Minister in four decades. During this visit, both countries elevated bilateral ties to a Strategic Partnership and adopted the India-New Zealand Strategic Partnership: Roadmap to 2030. A special gala event themed "India-New Zealand: A Winning Partnership" was hosted by the Prime Minister of New Zealand to commemorate the deepening ties and shared democratic values.

Part I: Features of the India-New Zealand Strategic Partnership: Roadmap to 2030

Political & Diplomatic Engagement

- Institutionalises regular high-level visits, Foreign Ministers' Dialogue, parliamentary exchanges, and annual Secretary-level meetings to steer the Strategic Partnership.

Defence and Maritime Security

- Expands military exchanges and naval exercises.
- Implements new arrangements on Maritime Cooperation, Hydrography and Nautical Cartography, and Mutual Logistics Support.
- Establishes an annual Maritime Security Dialogue for regular cooperation, coordination, and information exchange.

Counter-Terrorism & Security Cooperation

- Establishes a Joint Working Group on Counter-Terrorism.
- Strengthens cooperation on narcotics trafficking and law enforcement.
- Enhances cybersecurity cooperation through the India-New Zealand Cyber Dialogue.

Trade & Economic Cooperation

- Sets aspirational target of doubling bilateral trade to NZ$ 7 billion (₹35,000 crore) by 2030.
- Facilitates trusted trade through the 2025 Authorised Economic Operators Mutual Recognition Arrangement (AEO-MRA) under the 2024 Customs Cooperation Arrangement (CCA).
- Aims for early implementation of the India-New Zealand Free Trade Agreement.

Agriculture & Primary Industries

- Expands cooperation in horticulture, forestry, animal husbandry, and dairying.
- Concluded Memorandum of Cooperation (MoC) on Animal Husbandry and Dairying.
- Under the Agricultural Productivity Partnership, a Kiwifruit Action Plan and two Centres of Excellence in Nagaland and Uttarakhand will promote productivity through agricultural innovation, skills, and education.

Tourism, Culture & Sports

- Tourism Cooperation Agreement signed to increase two-way tourist flows.
- Updated Air Services Agreement seeks to encourage direct non-stop flights

between India and New Zealand.
- India-New Zealand Joint Action Plan on Sport will expand collaboration beyond cricket, particularly as India prepares to host the 2030 Commonwealth Games.
- Cultural Cooperation Arrangement will promote exchanges in arts and heritage.
- Cooperation between the National Maritime Heritage Complex, Lothal, and the New Zealand Maritime Museum will strengthen collaboration in maritime history and heritage.

Education, Research & Technology

- Expands cooperation in education, climate, digital transformation, and emerging technologies.
- Agreements between NCPOR and the University of Canterbury will strengthen Antarctic research.
- Cooperation between NIFTEM-K & Massey University will promote research, academic exchanges, and student mobility.

8. Clean Energy and Disaster Management
- New Zealand joined the Global Biofuels Alliance.
- MoC between NDMA and NEMA concluded to strengthen earthquake resilience, tsunami preparedness, coastal hazard mitigation, and disaster-response capacity.

Indo-Pacific & Multilateral Cooperation

- New Zealand prioritised the Maritime Security pillar of the IPOI, with focus on combating IUU Fishing.
- Both countries reaffirm support for a rules-based Indo-Pacific, peaceful dispute resolution under UNCLOS, UN reform, and India's permanent membership of a reformed UNSC.

Non-Binding Framework

- The Roadmap to 2030 creates no financial commitments or legally binding obligations and serves as the implementation framework for the Strategic Partnership.

Part III: Major Challenges to the Strategic Partnership

1. Dairy Sector Friction
- India's dairy sensitivities remain a major issue.

2. Agricultural Technology Transfer Concerns
- Technology transfer concerns exist despite cooperation opportunities.

3. Divergent China Calculus
- China's importance to New Zealand influences strategic choices.

4. Strategic and Normative Divergences
- Five Eyes membership and differing foreign-policy approaches require careful calibration.

5. Transnational Extremism Concerns
- India seeks stronger cooperation against separatist activities.

6. Labour Mobility Constraints
- Immigration policies affect skilled mobility.

Part IV: India's Strategic Partnerships - An Overview
- India has Strategic Partnerships or equivalent arrangements with around 46 countries and regional blocs.
- France was India's first Strategic Partnership.
- Japan is a Special Strategic and Global Partner.
- Russia has a Special and Privileged Strategic Partnership.
- Bhutan shares a treaty-based relationship.

Part V: Measures Required to Actualize the Roadmap to 2030

1. Institutionalizing Dispute Resolution
- Use Sectoral Working Groups to resolve SPS disputes.

2. Upgrading the Air Services Agreement
- Prioritise direct flight connectivity.

3. Deepen Non-Traditional Maritime Cooperation
- Focus on IUU Fishing, MDA, HADR and UNCLOS.

4. Fostering Niche Technological Synergies
- Focus on Green Hydrogen, Agri-Tech, Space and GBA.

5. Joint Outreach to Pacific Island Countries
- Expand NDMA-NEMA and CDRI cooperation.

Brief Conclusion

The India-New Zealand Strategic Partnership: Roadmap to 2030 represents a significant milestone in bilateral relations, elevating ties after four decades across trade, defence, maritime security, agriculture, technology, clean energy and disaster management. Effective implementation will determine whether this roadmap becomes a strong pillar of India's Indo-Pacific strategy.

Previous Year Question (Prelims)

Q. Consider the following countries: (2025)
- United Kingdom
- Denmark
- New Zealand
- Australia
- Brazil

How many of the above countries have more than four time zones?

A. All the five
B. Only four
C. Only three
D. Only two

Answer: B (Only four)

3rd India-Australia Annual Leaders' Summit 2026

Why in News?

- Prime Minister Narendra Modi visited Australia from 8-10 July 2026 for the Third Australia-India Annual Summit, held in Melbourne on 9 July 2026.
- The two leaders reviewed the Comprehensive Strategic Partnership and announced new initiatives in defence, maritime security, trade, critical minerals, energy, climate, technology, space, education, skills, sports and cultural cooperation.
- The summit is important because India and Australia are increasingly coordinating on Indo-Pacific stability, resilient supply chains, clean-energy transition and trusted technology partnerships.

India-Australia Relations: Background

- Diplomatic relations were established in 1941, even before India's independence.
- The relationship was upgraded to a Strategic Partnership in 2009 and to a Comprehensive Strategic Partnership (CSP) in 2020.
- The Annual Leaders' Summit mechanism began in 2023 and provides regular political direction to the bilateral relationship.
- The two countries cooperate through the Quad, G20, East Asia Summit, Indian Ocean Rim Association (IORA), Indo-Pacific Oceans Initiative (IPOI), Commonwealth and other multilateral forums.
- Strong people-to-people ties are supported by a large Indian-origin community, growing student mobility and expanding university partnerships.

Major Outcomes of the 2026 Summit

A. Defence and Security Cooperation

- A Joint Declaration on Defence and Security Cooperation was announced, signalling a major expansion in the scope and ambition of bilateral defence ties.
- An Annual Defence Ministers' Dialogue was established to institutionalise high-level strategic consultation.
- Both sides welcomed more frequent and complex exercises and exchanges under the Mutual Logistics Support Arrangement, which enables reciprocal logistics support.
- They agreed to improve interoperability across land, sea, air, cyber and space domains, including with multilateral partners.
- Work will continue on an MoU for the provision of defence articles and defence services, along with deeper defence-industry linkages.
- Professional military education will be expanded through institutional exchanges, wargaming, joint research and the General Rawat India-Australia Young Officers' Exchange Programme.
- A bilateral defence innovation framework will be explored to connect governments, industry, academia and research institutions.

B. Maritime Security and Indian Ocean Cooperation

- The India-Australia Maritime Security Collaboration Roadmap was adopted to guide information sharing, capability development, capacity building and operational coordination.
- An MoU between Australia's Maritime Border Command and the Indian Coast Guard will support a more secure maritime environment.
- The leaders reaffirmed freedom of navigation and overflight, peaceful settlement of disputes and respect for the United Nations Convention on the Law of the Sea (UNCLOS).
- Cooperation will deepen through IORA, IPOI and the Australia-India-Indonesia trilateral mechanism in maritime domain awareness, marine pollution control and the blue economy.
- Search-and-rescue cooperation and maritime safety training for IORA members were highlighted.

C. Trade, Investment and Economic Security

- The leaders welcomed growth in two-way trade under the India-Australia Economic Cooperation and Trade Agreement (ECTA).
- They committed to advancing an ambitious, balanced and mutually beneficial Comprehensive Economic Cooperation Agreement (CECA).
- Both sides agreed to reduce non-tariff barriers, improve investment flows and strengthen coordination among financial institutions.
- The CEO Forum and Track 1.5 Dialogue were recognised as useful mechanisms for industry-led engagement.
- Complementarities between 'Make in India' and 'Future Made in Australia' were highlighted in manufacturing, technology and investment.

D. Critical Minerals and Supply Chains

- The two countries agreed to promote investment, long-term supply and offtake arrangements in critical minerals.
- Cooperation will focus not only on mining but also processing, refining and value addition.
- Australia's mineral resources and India's manufacturing scale can jointly strengthen clean-energy and strategic-technology supply chains.

- Transparent, secure and resilient supply chains were identified as central to economic security.

E. Energy Security, Climate and Civil Nuclear Cooperation

- A Joint Statement on Energy Security was welcomed, covering reliable, affordable and sustainable energy supplies.
- Renewable energy, electrification and the India-Australia Renewable Energy Partnership will support the energy transition.
- The Rooftop Solar Academy was noted as a practical capacity-building initiative.
- Both countries reaffirmed the Paris Agreement and the principle of common but differentiated responsibilities and respective capabilities.
- Australia reiterated support for India's membership of the Nuclear Suppliers Group.
- An Administrative Arrangement under the bilateral Nuclear Cooperation Agreement was finalised, enabling long-term Australian uranium exports to India exclusively for peaceful purposes and under IAEA safeguards.

F. Cyber, Critical Technologies and Trusted Innovation

- The Australia-India Partnership on Cyber, Critical Technologies and Supply Chains (PACTS) was announced.
- PACTS aims to raise cooperation in cyber security, digital resilience, supply-chain diversification, critical technologies and defence research.
- The Australia-Canada-India Technology and Innovation (ACITI) Partnership MoU was also welcomed.
- Priority areas may include artificial intelligence, quantum technologies, semiconductors, telecommunications, cyber security and other emerging technologies.
- The emphasis on trusted partnerships reflects concerns about technological dependence and supply-chain vulnerability.

G. Space Cooperation

- Australia reaffirmed support for India's Gaganyaan Human Space Flight Programme.
- A temporary space-tracking terminal on the Cocos (Keeling) Islands will assist mission tracking.
- ISRO and the Australian Space Agency will deepen institutional and industry-to-industry cooperation.
- Australia's geographical location provides strategic advantages for tracking spacecraft over the southern Indian Ocean.

H. Education, Skills and People-to-People Links

- Australia announced AUD 10 million for Maitri grants to deepen economic and people-to-people connections.
- Flinders University received a Letter of Intent to establish a campus in Bengaluru.
- Victoria University received approval to operationalise a campus in Gurugram.
- A National Centre of Excellence for Skilling in Mining will be established at the National Skill Training Institute, Bhubaneswar, with support from Western Australia.
- The leaders recognised the contribution of the Indian diaspora and encouraged stronger parliamentary and democratic-institution linkages.

I. Sports and Cultural Cooperation

- An India-Australia Sports Collaboration Roadmap was welcomed, including cooperation linked to the Brisbane 2032 Olympics and Paralympics and Ahmedabad 2030 Commonwealth Games.
- Both sides noted progress in voluntary repatriation of human remains and cultural artefacts.
- Cultural cooperation strengthens public trust and adds a civilisational dimension to the strategic partnership.

Challenges in the Relationship

- CECA negotiations remain complex because of differences over agriculture, services, professional mobility, investment and regulatory standards.
- Trade is still concentrated in a limited number of commodities and needs greater diversification.
- Critical-mineral projects require high investment, long lead times, environmental safeguards and commercially viable offtake agreements.
- Visa, student welfare, qualification recognition and migration-policy changes can affect people-to-people ties.
- Different economic exposure to China can produce differences in strategic emphasis and risk tolerance.
- Implementation gaps can arise when political announcements are not followed by financing, institutional coordination and time-bound execution.
- Sensitive issues involving diaspora politics, misinformation and social tensions need careful diplomatic management.

Way Forward

- Conclude a balanced CECA while protecting legitimate domestic sensitivities.
- Develop joint critical-mineral projects covering extraction, processing, recycling and battery value chains.
- Operationalise defence roadmaps through joint production, maintenance, research and innovation.
- Build real-time maritime information-sharing and coordinated humanitarian assistance and disaster relief capabilities.
- Expand cooperation in green hydrogen, rooftop solar, storage, smart grids and clean-energy finance.
- Create strong safeguards for students, professionals and diaspora communities.
- Use the Quad, IORA, IPOI and trilateral mechanisms to deliver regional public goods.
- Set measurable timelines for summit announcements and conduct periodic implementation reviews.

Conclusion

The Third India-Australia Annual Leaders' Summit shows that the relationship has moved beyond a narrow security partnership into a broad framework covering defence, trade, critical minerals, clean energy, technology, education and regional governance. Its long-term value will depend on converting political commitments into commercially viable projects, stronger institutions and measurable outcomes.
A mature India-Australia partnership can contribute significantly to a stable Indo-Pacific, resilient supply chains and India's development and strategic autonomy.

UPSC Civil Services Prelims PYQ

Question (UPSC CSE Prelims 2015): With reference to the Indian Ocean Rim Association for Regional Cooperation (IOR-ARC), consider the following statements:
1. It was established very recently in response to incidents of piracy and accidents of oil spills.
2. It is an alliance meant for maritime security only.
Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer: (d) Neither 1 nor 2.

ACADEMIC BANK OF CREDITS & APAAR

Why in News?

- The Academic Bank of Credits (ABC) and the Automated Permanent Academic Account Registry (APAAR) are being expanded as the digital backbone of India's learner-centric education system.
- The current policy focus is on linking students, educational institutions, verified academic credentials and credit records through a common interoperable ecosystem.
- The reform is important because India is moving from a rigid, institution-bound model towards flexible learning pathways, multiple entry and exit, multidisciplinary education, online learning and recognition of skills.

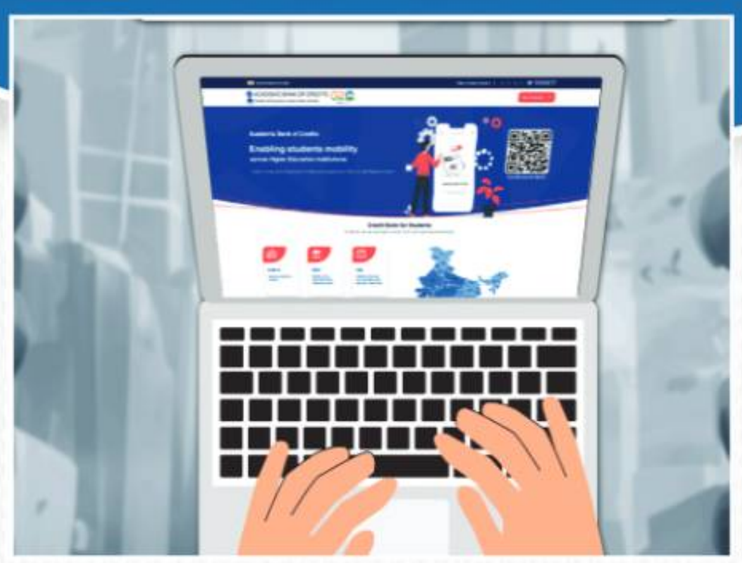
Background: National Education Policy 2020

- NEP 2020 seeks to make education holistic, multidisciplinary, flexible, inclusive and learner-centred.
- It recommends an Academic Bank of Credit to digitally store credits earned from recognised Higher Education Institutions (HEIs), so that qualifications may be awarded after considering accumulated credits.
- ABC supports multiple entry and exit. A learner may pause education because of financial, family, health or employment reasons and later resume studies without losing valid credits.
- APAAR extends this idea by creating a permanent digital identity that can connect records across school education, higher education, skilling and lifelong learning.
- The wider objective is portability of learning: the student should not lose verified academic achievements merely because the institution, programme, state or mode of study changes.

Academic Bank of Credits (ABC)

3.1 Meaning

- ABC is a digital or virtual academic service mechanism established under the Ministry of Education and regulated through the University Grants Commission framework.



- It functions like a bank only by analogy: instead of money, verified academic credits are deposited in the learner's academic account.
- It facilitates credit recognition, accumulation, transfer and redemption among eligible institutions, subject to the rules of the institution awarding the final qualification.

3.2 Main Functions

- Deposit: Credits awarded by registered institutions are digitally deposited in the learner's account.
- Accumulation: Credits earned at different times, through eligible courses and institutions, may be accumulated.
- Transfer: Credits can be transferred between participating institutions according to regulatory and institutional norms.
- Redemption: An awarding institution may count eligible credits towards a certificate, diploma or degree.
- Authentication: The system supports verified credit records and reduces dependence on unverified paper claims.
- Academic mobility: It enables learners to move within or between institutions and across approved learning modes.

3.3 How ABC Works

3. A student receives an APAAR ID and has an academic account linked with the ABC ecosystem.
4. The student completes an eligible course from a recognised and participating institution or approved platform.
5. The credit-awarding institution uploads verified credits to the ABC account.
6. The student may later request recognition or transfer of those credits.
7. The institution granting the final qualification evaluates equivalence, curriculum requirements, validity and the maximum credits that may be accepted.
8. After satisfying programme requirements, the credits are redeemed for the relevant academic award.

3.4 Important Regulatory Points

- ABC does not independently award degrees, diplomas or certificates. The recognised educational institution remains the awarding authority.
- Credit transfer is not automatic in every case. It depends on equivalence, programme structure and the rules of the receiving or degree-awarding institution.
- The UGC regulations provide for a defined shelf-life of credits, ordinarily not exceeding seven years, as specified and accepted under applicable institutional rules.
- Academic institutions are responsible for the authenticity and integrity of credits uploaded by them.
- ABC supports learning through face-to-face, online, open and distance, and hybrid modes where these are approved under the regulatory framework.

APAAR: One Nation, One Student ID

4.1 Meaning and Identity

- APAAR stands for Automated Permanent Academic Account Registry.
- It is a unique 12-digit identification number intended to serve as a permanent digital academic identity for a learner.
- APAAR is part of the "One Nation, One Student ID" initiative and is aligned with NEP 2020 and the National Credit Framework.
- It is integrated with DigiLocker and the Academic Bank of Credits, enabling verified credentials and credit records to be associated with one learner identity.

4.2 Records That May Be Linked

- Marksheets, grade sheets and scorecards.
- Degrees, diplomas and certificates.
- Academic credits and qualifications.
- Skill, vocational and upskilling achievements.
- Co-curricular and other recognised learning accomplishments, where integrated by authorised institutions.

4.3 Registration Process

9. Verification of student demographic details through the educational institution.
10. Parental consent where the student is a minor.
11. Identity authentication and matching of records.
12. Generation of the APAAR ID after successful verification.
13. Availability of the digital APAAR card through DigiLocker.

Official prerequisites commonly include: matching of the student's name in institutional/UDISE+ records with Aadhaar details and availability of the Permanent Education Number (PEN), wherever applicable to the school-level process.

5. ABC and APAAR: Difference and Relationship

Aspect	APAAR	Academic Bank of Credits
Nature	Unique lifelong student identity	Digital academic credit-management mechanism
Main purpose	Identifies the learner and links verified academic records	Stores, accumulates, transfers and redeems eligible credits
Coverage	Designed for the learner's academic journey across levels	Primarily supports credit-based learning and mobility
Integration	Connected with DigiLocker and ABC	Uses the learner's APAAR identity to manage credit records
Awarding power	Does not award qualifications	Does not itself award qualifications; the eligible institution does
Simple analogy	Academic identity/passport	Academic credit ledger/bank account

Link with Other Education Reforms

- National Credit Framework (NCrF): Creates a common credit language across school education, higher education and vocational/skilling pathways.
- Multiple Entry and Exit: Allows learners to pause and re-enter programmes with recognition of valid accumulated credits.
- SWAYAM and Online Learning: Approved online courses can support credit earning and transfer under applicable rules.
- DigiLocker and National Academic Depository: Provide trusted digital storage and verification of academic awards and documents.
- Multidisciplinary Education: Enables learners to combine courses from different disciplines and institutions, subject to programme norms.
- Lifelong Learning: Supports reskilling and upskilling throughout a person's educational and professional life.

Significance for Students and the Education System

- Seamless mobility: Students can move between institutions and learning modes with better continuity of records.
- Academic flexibility: Learners can design more personalised and multidisciplinary learning pathways.
- Reduction in dropout loss: A temporary break need not erase previously earned and valid academic credits.
- Paperless governance: Verified digital records reduce repeated submission, loss or damage of physical certificates.
- Faster verification: Institutions, examination bodies and employers can verify authorised academic records more efficiently.
- Fraud reduction: Digitally issued and institution-verified credentials can help control fake marksheets and degree fraud.
- Recognition of diverse learning: The system can integrate academic, vocational, skill and approved online learning.
- Administrative efficiency: Standardised digital records can improve planning, credit mapping and institutional coordination.
- Improved employability: A consolidated learning profile may help demonstrate qualifications and skills to employers.
- Support for inclusion: Migrant students and learners compelled to interrupt education may benefit from portable records and credits.

Concerns & Implementation Challenges

- Privacy and data protection: APAAR may hold extensive lifelong educational data. Collection, sharing, retention and access must follow purpose limitation, informed consent, security and legal safeguards.
- Aadhaar dependence and exclusion: Mismatch in names, dates or demographic details can delay ID creation. Students without smooth documentation access may face exclusion.
- Consent of minors: Parental consent must be meaningful and informed, rather than merely procedural.
- Cybersecurity: A central digital ecosystem can become a target for data theft, identity misuse or unauthorised profiling.
- Digital divide: Students and institutions in rural or disadvantaged areas may have weak connectivity, limited digital literacy or inadequate technical support.
- Institutional readiness: Credit mapping, curriculum equivalence and timely uploading require trained staff and interoperable information systems.

Safeguards & Way Forward

- Adopt privacy-by-design: collect only necessary data, define retention periods and restrict access according to role and purpose.
- Provide genuine informed consent, especially for minors, along with simple opt-out, correction and grievance procedures consistent with applicable law.
- Create offline and assisted registration routes so that documentation or connectivity gaps do not exclude learners.
- Develop transparent national standards for credit equivalence, learning outcomes, assessment quality and maximum transferable credits.
- Retain academic oversight by the final awarding institution while preventing arbitrary rejection of valid credits.

Conclusion

The Academic Bank of Credits and APAAR can transform India's education system by making learning portable, flexible and verifiable. Their real success, however, will depend not merely on generating digital IDs or uploading credits, but on ensuring academic quality, institutional interoperability, meaningful consent, data protection and equal access. Implemented with strong safeguards, the two systems can become an important foundation for multidisciplinary education and lifelong learning under NEP 2020.

Prelims PYQ

UPSC CSE Prelims 2016

'SWAYAM', an initiative of the Government of India, aims at:
(a) Promoting Self Help Groups in rural areas
(b) Providing financial and technical assistance to young start-up entrepreneurs
(c) Promoting the education and health of adolescent girls
(d) Providing affordable and quality education to the citizens for free

Answer: (d) Providing affordable and quality education to the citizens for free.

DRDO TESTS PINAKA LONG RANGE GUIDED ROCKET (LRGR-120)

Why in News?

- DRDO successfully conducted the maiden flight test of the Pinaka Long Range Guided Rocket, designated LRGR-120, at the Integrated Test Range in Chandipur on 29 December 2025.
- The rocket was tested up to its maximum range of 120 km, performed all planned in-flight manoeuvres and impacted the designated target with high precision.
- The LRGR-120 was fired from an in-service Pinaka launcher. This demonstrates that the same launcher can fire Pinaka variants of different ranges, reducing the need for separate launcher platforms.
- The test strengthens the Indian Army's long-range precision-strike capability and advances India's defence indigenisation goals.

Pinaka Rocket System: Basic Profile

- Pinaka is an indigenous, all-weather, indirect-fire, multi-barrel rocket launcher system developed for the Indian Army.
- The system is named after the bow of Lord Shiva.
- It was developed primarily by DRDO's Armament Research and Development Establishment (ARDE), Pune, with contributions from other DRDO laboratories, public-sector entities and private industry.
- Pinaka is designed to deliver a large volume of fire in a short period against area targets such as troop concentrations, artillery positions, logistics nodes, command centres and infrastructure.
- Unlike a conventional gun, a rocket system carries its own propulsion. A multi-barrel launcher can rapidly fire several rockets, producing a concentrated strike over a target area.
- Pinaka has evolved from unguided, shorter-range rockets to enhanced-range and precision-guided variants.

LRGR-120: Main Features Demonstrated

- Extended strike range: The rocket demonstrated a maximum range of 120 km, substantially extending the reach of the Pinaka family.
- Precision guidance: The guided configuration allows the rocket to correct its trajectory and strike a selected target more accurately than an unguided area-fire rocket.
- In-flight manoeuvrability: The trial validated planned manoeuvres during flight, showing the performance of its guidance, navigation and control functions.
- Common-launcher compatibility: It was launched from an existing Pinaka launcher, enabling different rocket variants to be operated through a common platform.
- Mobile land-based firepower: The truck-mounted launcher offers mobility, quicker deployment and the ability to relocate after firing.
- Indigenous development: The project strengthens domestic capability in propulsion, guidance, navigation, control, warheads, launch systems and system integration.

How a Guided Artillery Rocket Works

- Propulsion system: A solid rocket motor produces thrust and carries the rocket towards the target. Solid propellant allows relatively quick launch readiness and easier field handling.
- Navigation system: Inertial navigation estimates position and movement using onboard sensors. Satellite-based navigation may provide position updates where incorporated and available.
- Guidance and control: The onboard computer compares the rocket's actual path with the planned trajectory and commands control surfaces or other control mechanisms to correct deviations.
- Warhead and fuze: The warhead produces the intended battlefield effect, while the fuze determines the conditions under which it functions.
- Launcher and fire-control system: Target coordinates, firing data and mission parameters are processed before launch. The launcher provides elevation and direction for firing.
- Tracking and telemetry during trials: Ground-based sensors, telemetry stations and range instruments record the rocket's path and verify whether the mission objectives were achieved.

Strategic Significance for India

- Long-range precision fires: LRGR-120 enables artillery units to engage important targets deeper inside hostile territory without moving launchers close to the forward line.
- Standoff capability: Greater range permits forces to strike from a relatively safer distance, reducing exposure to enemy artillery and counter-battery fire.
- Reduced collateral damage: Greater accuracy allows commanders to use rockets against selected military targets with lower unintended damage than broad-area unguided fire, subject to target identification and operational conditions.
- Common-platform advantage: Compatibility with existing launchers simplifies logistics, training, maintenance and deployment. Ammunition variants can be selected according to the mission.
- Faster concentration of fire: Multiple-launch systems can deliver intense fire quickly, supporting offensive operations, suppression of enemy defences and disruption of logistics.
- Network-centric warfare: When connected with drones, satellites, radars, battlefield surveillance systems and secure

Rocket, Missile and Artillery Gun: Exam-Oriented Difference

Basis	Artillery shell	Guided rocket	Missile
Propulsion	No onboard propulsion after leaving the gun barrel	Onboard rocket propulsion	Onboard propulsion; may use rocket or air-breathing propulsion
Guidance	Usually ballistic; guided shells also exist	Guidance may correct trajectory	Normally has a sophisticated guidance system
Typical role	Direct/indirect artillery fire	Area fire or precision land attack	Specialised precision attack, air defence, anti-ship, ballistic or other roles
Cost and complexity	Generally lower	Intermediate	Usually higher, depending on type

communications, precision rockets can shorten the sensor-to-shooter cycle.
- Import substitution: Indigenous rocket artillery reduces dependence on foreign systems, spares and ammunition during crises.
- Defence exports: A mature and operationally proven Pinaka ecosystem can enhance India's position as a supplier of complete defence systems, subject to government policy and export agreements.

Role in Modern Warfare

- Modern conflicts show increasing use of long-range precision fires to attack ammunition depots, air-defence nodes, command posts, bridges and supply routes.
- Rocket artillery fills the capability space between conventional tube artillery and more expensive tactical missiles.
- A guided rocket generally offers a combination of longer reach, faster response and lower cost per engagement than many missile systems, though its exact suitability depends on target type, required accuracy and warhead effect.
- Mobility and "shoot-and-scoot" tactics improve survivability against counter-battery radars, drones and precision retaliation.
- The system's effectiveness ultimately depends on accurate intelligence, surveillance, target acquisition, communications, logistics and trained crews—not merely maximum range.

Indigenisation and Aatmanirbhar Bharat

- Pinaka represents a transition from importing complete weapon systems to designing, producing and improving a domestic family of rocket artillery systems.
- Indigenisation creates domestic design knowledge, testing infrastructure, skilled employment and a production ecosystem that can support upgrades throughout the system's life cycle.
- Industry participation improves production capacity and allows DRDO to focus increasingly on advanced research, new variants and critical technologies.
- A common system family creates economies of scale in launchers, spares, training, maintenance and ammunition manufacture.
- However, true self-reliance requires secure supply chains for seekers, sensors, navigation components, energetic materials, electronics and specialised manufacturing equipment—not merely final assembly in India.

Limitations & Challenges

- Testing is not the same as induction: A successful developmental test must be followed, where applicable, by additional technical trials, user evaluation, quality assurance, procurement and production.
- Targeting quality: A 120 km weapon requires reliable real-time intelligence and precise target coordinates. Poor targeting information can negate the advantage of an accurate rocket.
- Navigation resilience: Guided weapons must remain effective in an environment affected by satellite-navigation jamming, spoofing and electronic warfare.
- Survivability: Long-range launchers can still be located by drones, satellites and counter-battery systems; camouflage, mobility, deception and rapid relocation remain essential.
- Cost balance: Precision-guided ammunition is costlier than unguided rockets, so commanders must match the munition to the value and nature of the target.
- Mass production and quality control: Strategic value depends on adequate stockpiles, consistent production quality and timely delivery, not only successful prototypes.
- Doctrine and integration: The Army must integrate LRGR-120 with surveillance assets, command networks, airspace management and other artillery and missile units.

Broader Security and Policy Implications

- The system can strengthen conventional deterrence by increasing the cost of hostile troop concentration, logistics build-up and command infrastructure near conflict zones.
- Long-range precision weapons can compress decision time and make escalation management more complex; operational doctrine and political control are therefore important.
- India must combine technological capability with adherence to international humanitarian law, including distinction, proportionality and precautions in attack.
- Export potential should be balanced with end-use monitoring, strategic partnerships and India's international commitments.
- Domestic defence innovation should prioritise interoperable systems, open architectures, testing capacity and long-term maintenance support.

Relevant Government and Defence Concepts

- Defence indigenisation: Increasing domestic design, development, manufacturing and life-cycle support of military equipment.
- Positive indigenisation lists: Lists of defence items that are planned to be procured from domestic sources within specified timelines.
- Innovations for Defence Excellence (iDEX): Supports innovation by start-ups, MSMEs, individual innovators and research institutions for defence applications.
- Defence corridors: Industrial clusters intended to promote defence manufacturing and supply-chain development.

- Technology transfer: Transfer of design and production know-how from the developer to authorised production agencies and industry partners.
- User trials: Trials conducted with the armed forces to assess whether a system meets operational requirements under realistic conditions.

and its range is about 4,000 km rather than 7,500 km. Therefore, only Statement 1 is correct.

Sources Consulted

- Press Information Bureau, Ministry of Defence: "DRDO successfully conducts maiden flight test of Pinaka Long Range Guided Rocket", 29 December 2025.
- Drishti IAS: "Pinaka Long Range Guided Rocket", 30 December 2025, and the linked current-affairs topic provided by the user.
- Ministry of Defence Annual Reports: background on Guided Pinaka, its guidance system, earlier range development and trials.
- DRDO Newsletter, February 2026: report

on the LRGR-120 maiden flight test.

- Munitions India Limited and Indian defence-industry material: general Pinaka system and ammunition background.
- UPSC Civil Services Preliminary Examination 2014: Agni-IV question.

Brief Conclusion

The successful 120 km test of the Pinaka LRGR-120 is an important step in the evolution of India's indigenous rocket artillery. Its combination of precision guidance, longer reach and compatibility with the existing Pinaka launcher can improve operational flexibility while reducing additional infrastructure and logistics burdens. Its full strategic value, however, will depend on reliable targeting networks, electronic-warfare resilience, rigorous user trials, large-scale quality production and integration into Army doctrine. Thus, LRGR-120 reflects both India's expanding defence-technology capability and the broader requirement to build a complete indigenous military-industrial ecosystem.

Prelims PYQ

UPSC Civil Services Preliminary Examination, 2014

With reference to Agni-IV Missile, which of the following statements is/ are correct?

1. It is a surface-to-surface missile.
2. It is fuelled by liquid propellant only.
3. It can deliver one-tonne nuclear warheads about 7,500 km away.

Select the correct answer using the code given below:

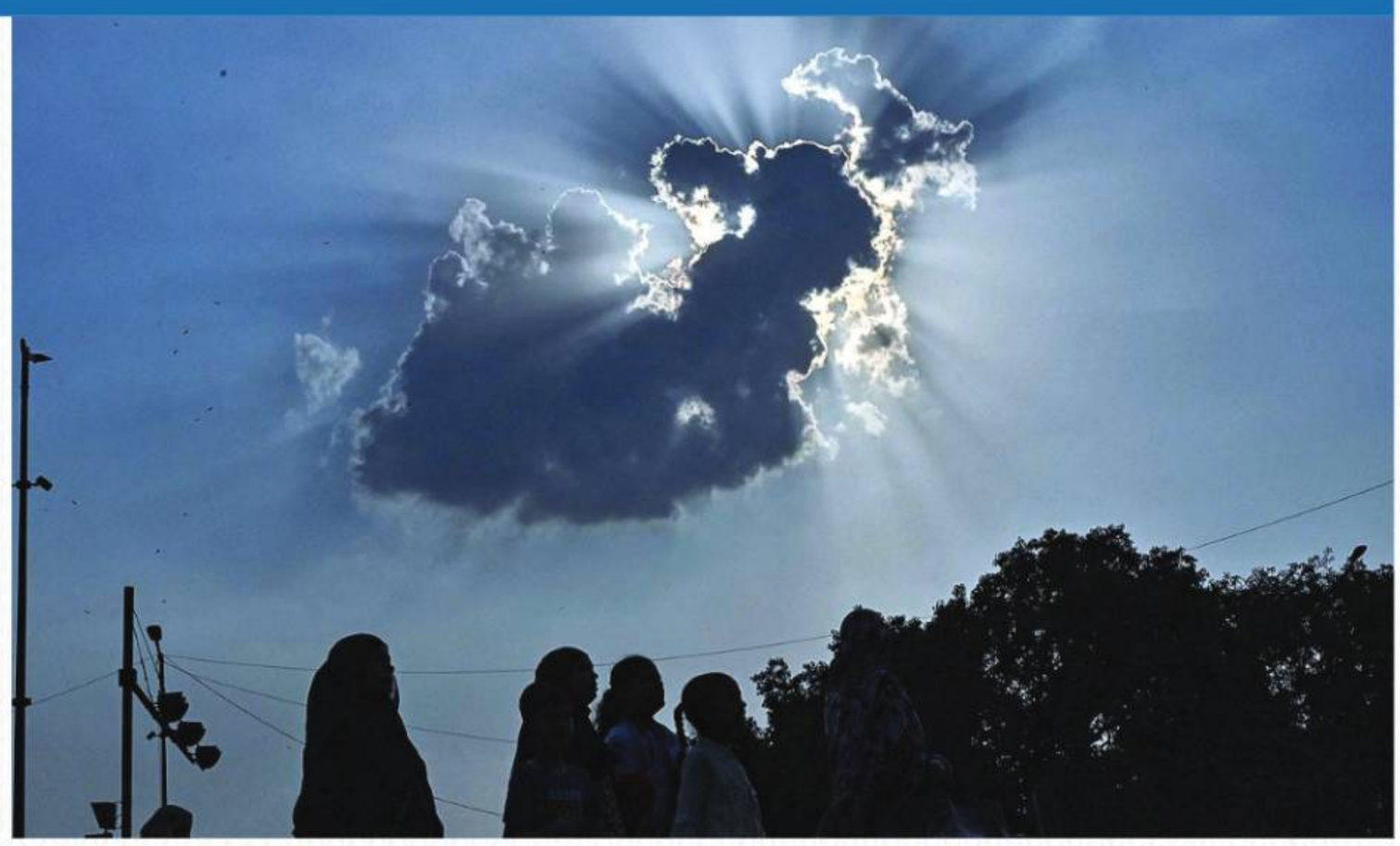
(a) 1 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Answer: (a) 1 only

EVAPORATION OF MONSOON RAIN

Why in News?

- A recent isotope-based study quantified how much monsoon rainfall evaporates while falling from clouds to the ground over Pune, located on the leeward side of the northern Western Ghats.
- The study found that daily raindrop mass loss varied from about 4% to 61% during the 2019 southwest monsoon, with a seasonal average of nearly 23%. Drishti IAS rounded the broader finding to about one-fourth of rainfall mass.
- The finding is important because conventional rain gauges record only the rain that reaches the surface. They do not directly measure the water that evaporates below the cloud base.
- The research improves understanding of monsoon hydrology, atmospheric cooling, downdrafts, cloud evolution and the accuracy of weather and climate models.



Part I: Understanding Raindrop Evaporation

1. What is Raindrop Evaporation?

- Raindrop evaporation is the conversion of liquid water in falling rain droplets into water vapour before the droplets reach the ground.
- It mainly occurs in the sub-cloud layer, the atmospheric region between the cloud base and the land surface.
- The process is stronger when the air is warm and relatively dry, because the atmosphere has greater capacity to absorb water vapour.
- Small droplets are more vulnerable because they have a larger surface-area-to-volume ratio and a slower fall speed, giving them more time to evaporate.

Virga & Partial Evaporation

- Virga refers to precipitation that falls

from a cloud but completely evaporates or sublimates before reaching the surface.
- The Pune study mainly examined partial mass loss from raindrops that still reached the ground, not merely complete disappearance as virga.
- Thus, even during measurable rainfall, the original cloud-produced precipitation may have been substantially larger than the rain-gauge total.

Factors Controlling Evaporation

- Temperature: Higher air temperature increases the saturation vapour pressure and generally accelerates evaporation.
- Relative humidity: Lower humidity creates a larger vapour-pressure deficit between the raindrop surface and the surrounding air.
- Drop size: Smaller drops evaporate faster relative to their mass.
- Fall distance: A higher cloud base gives droplets more time to evaporate.
- Rain intensity: Light rain commonly contains many small drops and therefore can lose a larger fraction of mass.
- Vertical air motion: Updrafts and downdrafts change the time spent by droplets in the sub-cloud layer.
- Wind and ventilation: Airflow around a falling drop enhances transfer of heat and water vapour.
- Atmospheric stability and mixing: Entrainment of dry air below clouds can sharply increase evaporation.

Part III: Scientific and Climatic Significance

1. Atmospheric Cooling & Downdrafts

- Evaporation requires latent heat, which is taken from the surrounding air. The air therefore cools.
- Cooled air becomes denser and can sink, strengthening downdrafts and gust fronts beneath clouds.
- These downdrafts can influence storm organisation, cloud lifetime and the location of subsequent convection.

2. Monsoon Circulation and Cloud Evolution

- Raindrop evaporation changes temperature and humidity profiles in the lower troposphere.
- It can modify atmospheric stability, boundary-layer recovery and the triggering or suppression of new convective cells.
- When represented poorly in models, it can contribute to errors in simulated rainfall intensity, timing and spatial distribution.

3. Precipitation Efficiency

- Precipitation efficiency refers to the proportion of condensed cloud water that ultimately reaches the surface as rainfall.
- Strong below-cloud evaporation lowers precipitation efficiency, especially in light-rain and dry-subcloud conditions.
- A cloud may therefore produce substantial precipitation aloft while the surface receives much less water.

Water & Energy Budgets

- Evaporated rainfall returns moisture to the atmosphere instead of directly contributing to runoff, soil moisture, reservoirs or groundwater recharge.
- At the same time, evaporative cooling redistributes energy and affects the atmospheric heat budget.
- Accurate estimates are therefore relevant to both hydrological models and climate-energy balance studies.

Part IV: Implications for India

1. Weather Forecasting

- Numerical weather prediction models must represent raindrop size, fall speed, humidity and microphysical evaporation correctly.
- Better parameterisation can improve short-range forecasts of rainfall reaching the surface, thunderstorm downdrafts and local temperature changes.

2. Flood and Drought Assessment

- During intense rainfall, the fractional evaporation loss may be small, but the absolute amount can still be significant.
- During light rainfall, a large fraction may evaporate, reducing effective rainfall available for crops and recharge.
- Rainfall estimates from radar or satellites measure precipitation at different atmospheric levels and may overestimate surface rainfall if below-cloud evaporation is ignored.

3. Agriculture

- Farm decisions depend on effective rainfall reaching the soil rather than precipitation produced inside clouds.
- In rain-fed regions, repeated light-rain events may contribute less usable water than expected if evaporation losses are high.
- Improved estimates can support irrigation scheduling, crop advisories and drought monitoring.

4. Water-Resource Planning

- Reservoir inflow and groundwater recharge models require accurate surface precipitation data.
- Accounting for below-cloud loss can improve basin-scale water budgeting, especially across rain-shadow and semi-arid regions.

5. Climate Change Link

- A warmer atmosphere can hold more water vapour, but the effect on raindrop evaporation depends strongly on how relative humidity changes.
- Higher temperatures combined with drier sub-cloud layers may increase evaporation losses in some regions.
- Climate change may also alter cloud-base height, rain intensity and drop-size distributions, making regional impacts complex rather than uniform.

Part V: Western Ghats and Indian Monsoon Context

1. Orographic Rainfall Mechanism

- Moist winds from the Arabian Sea are forced to ascend the Western Ghats.
- Rising air expands, cools and condenses, causing heavy rainfall on the windward western slopes.
- After crossing the crest, descending air warms adiabatically, creating comparatively dry conditions on the eastern side.

2. Rain-Shadow Effect

- Pune and parts of interior Maharashtra receive less rainfall than the Konkan coast because of their leeward location.
- A deeper and drier sub-cloud layer can promote stronger evaporation of falling drops in such regions.

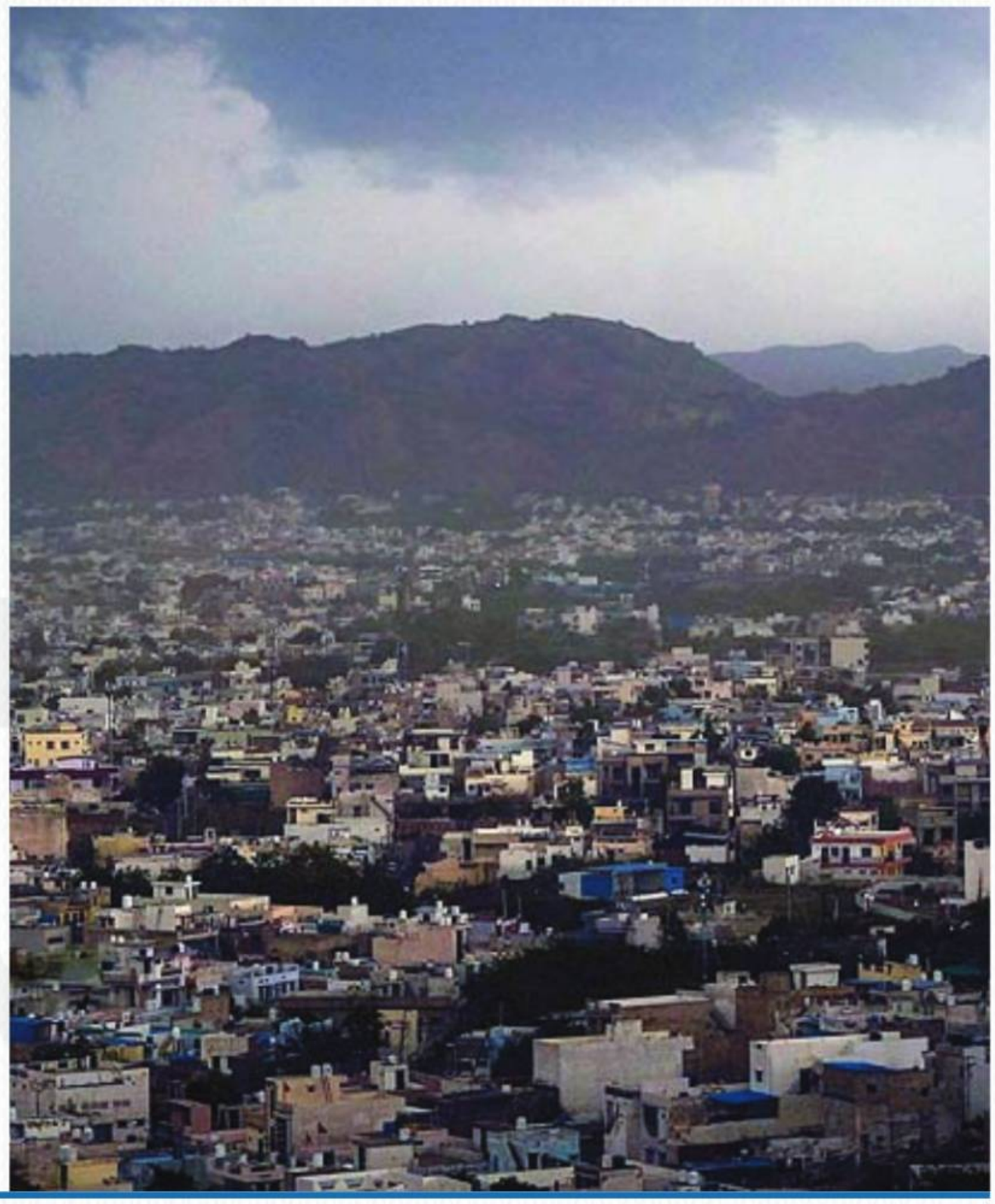
3. Types of Monsoon Rain

- Convective rain is generally intense, localised and associated with larger drops; its fractional evaporation is often lower.
- Stratiform or light rain contains smaller drops and may fall through a deeper unsaturated layer, producing greater fractional evaporation.
- Monsoon systems often contain both convective and stratiform components, so evaporation varies within the same weather system.
- ations for monsoon forecasting and water-resource planning in India.

Conclusion

The study on monsoon raindrop evaporation shows that rainfall measured at the ground can be substantially lower than precipitation produced within clouds. An average loss of about 23%

over Pune during the 2019 monsoon demonstrates that below-cloud processes are important even in a humid monsoon environment. Incorporating raindrop evaporation into weather models, satellite-rainfall correction, agricultural advisories and water budgeting can improve India's capacity to manage monsoon variability. However, the estimate is regional and must be validated through long-term observations across India before being generalised.



Previous Year Question (Prelims)

Q. La Nina is suspected to have caused recent floods in Australia. How is La Nina different from El Nino? (UPSC CSE Prelims, 2011)

- 1. La Nina is characterised by unusually cold ocean temperature in the equatorial Indian Ocean, whereas El Nino is characterised by unusually warm ocean temperature in the equatorial Pacific Ocean.
- 2. El Nino has an adverse effect on the southwest monsoon of India, but La Nina has no effect on the monsoon climate.

Select the correct answer using the code given below:

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

Answer: (d) Neither 1 nor 2.

WORLD'S FASTEST SUPERCOMPUTER

Context

China's supercomputer 'LineShine' was named the world's fastest supercomputer at the 2026 ISC High Performance, replacing the US-based 'El Capitan'. LineShine achieved double-precision performance on the High-Performance Linpack benchmark.

Part I: Understanding the Benchmark & Forum

1. High-Performance Linpack (HPL) Benchmark

- A global software test that measures a computer's floating-point computing power.
- Measures raw mathematical processing speed in solving large, dense linear systems.
- Performance is measured in floating-point operations per second (FLOPS).
- Standard benchmark for the TOP500 list.

2. ISC High Performance

- Formerly International Supercomputing Conference.
- Started in 1986.
- Covers HPC, AI and quantum technologies.
- Announces the bi-annual TOP500 list.

Part II: About Supercomputers

1. Definition

- High-performance computing systems using thousands of processing cores.
- Solve complex problems through parallel computation.
- Perform quadrillions of calculations per second.

2. Working Mechanism

- Uses parallel processing.
- Multiple processors execute different

parts simultaneously.
- Greatly reduces computation time.

3. Applications
- Weather forecasting and climate modelling.
- Drug discovery and molecular modelling.
- Nuclear simulations and defence.
- Financial modelling.
- AI and machine learning.
- Space research.

Part III: Global Supercomputing Landscape
1. China
- LineShine reclaimed first position.
- Earlier leaders included Sunway Taihu-Light and Tianhe-2.

2. United States
- El Capitan ranked second.
- Other systems include Summit and Sierra.

3. Other Players
- Japan: Fugaku.
- European Union: EuroHPC.
- India: AIRAWAT and PARAM series.

Part IV: India's Supercomputing Programme
1. National Supercomputing Mission
- Launched in 2015.
- Targets 70 supercomputers.
- Implemented by C-DAC and IISc.

2. Major Systems
- PARAM Siddhi-AI.
- AIRAWAT.
- PARAM Ganga.
- PARAM Utkarsh.

3. Significance
- Reduces foreign dependence.
- Supports AI, defence and research.
- Builds skilled workforce.

Part V: Strategic Implications
- National security.
- Economic competitiveness.
- Scientific leadership.
- Technological sovereignty.

Part VI: Challenges
- High energy consumption.
- High hardware cost.
- Software complexity.
- Export restrictions.
- Skilled manpower requirement.

Conclusion
China's LineShine becoming the world's fastest supercomputer reflects the growing strategic importance of high-performance computing in science, defence, artificial intelligence and economic competitiveness. For India, strengthening the National Supercomputing Mission and indigenous HPC capabilities is essential for technological sovereignty and future innovation.

Previous Year Question (Prelims)
Q. With reference to 'Supercomputers' in India, which of the following statements is/are correct?

1. The National Supercomputing Mission aims to install 70 supercomputers across India.
2. PARAM Siddhi-AI is India's first AI supercomputer.
3. The Centre for Development of Advanced Computing (C-DAC) is the implementing agency for the National Supercomputing Mission.
(a) 1 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

SABANG PORT

Context
India and Indonesia signed an agreement during Prime Minister Modi's state visit to Jakarta in July 2026 to jointly develop Sabang Port. This strategic move aims to enhance maritime cooperation, secure critical sea lanes, and expand bilateral trade.

Part I: About Sabang Port
1. Location
- Situated on Weh Island in Indonesia's Aceh province.
- Located at the northernmost tip of Sumatra.
- Overlooks the Strait of Malacca, one of the world's busiest shipping lanes.
- Lies just 160 km from Great Nicobar Island (India's southernmost territory).

Features
- A natural deep-water port with significant strategic value.
- Capable of handling large naval and commercial vessels.
- Positioned at the entrance of the Strait of Malacca, controlling access to one of the world's most critical choke points.

Part II: Strategic Significance of Sabang Port
1. Necklace of Diamonds Strategy
- Sabang Port serves as a node in India's 'Necklace of Diamonds' maritime strategy.
- Counters China's 'String of Pearls' network.

2. Complementing the Great Nicobar Project

- Works with India's Great Nicobar Project to secure the northern entrance of the Malacca Strait.

3. Control Over the Strait of Malacca

- The Strait carries about 25% of global seaborne trade and around 80% of China's crude oil imports.

Part III: Broader Geopolitical Implications

- Countering China's influence in the Indian Ocean.
- Strengthening India–Indonesia Comprehensive Strategic Partnership.
- Supporting Act East Policy and a free, open Indo-Pacific.

Part IV: Economic Dimensions

- Develop short-sea shipping networks.
- Target bilateral trade of USD 100 billion by 2030.
- Improve ASEAN–India connectivity and logistics.

Part V: India's Maritime Strategy

- SAGAR (Security and Growth for All in the Region).
- Indian Ocean Naval Symposium (IONS).
- Exercises: Malabar, Milan and BIMSTEC cooperation.

Part VI: Challenges

- Infrastructure investment.
- Geopolitical sensitivities.
- Environmental concerns in ecologically sensitive areas.

Part VII: Way Forward

- Joint naval coordination and maritime domain awareness.
- Promote trade facilitation and port connectivity.
- Strengthen ASEAN, IORA and Quad cooperation.

Conclusion

The joint development of Sabang Port significantly strengthens India's maritime strategy in the Indo-Pacific. Together with the Great Nicobar Project, it enhances India's strategic reach near the Strait of Malacca, supports the Act East Policy, reinforces the SAGAR doctrine, and deepens India–Indonesia cooperation while improving regional connectivity and trade.

Previous Year Question (Prelims)

Q. With reference to the 'Strait of Malacca', which of the following statements is/are correct?

1. It connects the Andaman Sea with the South China Sea.
2. It is one of the busiest shipping lanes in the world.
3. It is located between the Malay Peninsula and the island of Sumatra.

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

Answer: (d)

AGREEMENT ON SARDAR SAROVAR PROJECT FINANCIAL DISPUTES

Why in News?

In a landmark development for cooperative federalism, the states of Maharashtra, Gujarat, Rajasthan, and Madhya Pradesh signed a one-time settlement agreement in July 2026 to resolve decades-old financial disputes concerning the cost-sharing and pending dues of the Sardar Sarovar Project (SSP). The agreement was signed in New Delhi in the presence of Union Home Minister Amit Shah and Union Jal Shakti Minister C.R. Patil, along with the Chief Ministers of all four states.

Part I: Understanding the Agreement & Its Scope

1. Nature of the Agreement

- A one-time settlement agreement to resolve long-pending financial disputes among the four beneficiary states.
- Described as an example of cooperative federalism.
- The agreement does not alter existing allocation of water, electricity or irrigation benefits under the NWDT Award (1979).

2. Scope of Financial Disputes Resolved

- Cost-sharing of Sardar Sarovar and Indira Sagar projects.
- Resettlement & Rehabilitation (R&R) expenditure.
- Compensation for submerged land.
- Interest burden on construction borrowings.
- Maintenance costs and other pending liabilities.

3. Major Financial Adjustments

- Gujarat increased its share of project cost to 75%.
- Maharashtra will pay only ₹27 crore instead of earlier claims of ₹2,000–3,000 crore.
- Madhya Pradesh will pay ₹550 crore to Gujarat.

Part II: About the Sardar Sarovar Project (SSP)

1. Historical Background

- Vision proposed by Sardar Vallabhbhai Patel (1946).
- Foundation stone laid by Prime Minister Jawaharlal Nehru on 5 April 1961.
- One of India's largest multipurpose river valley projects.

2. Technical Specifications

- Concrete gravity dam on the Narmada River near Navagam, Gujarat.
- Located near the Statue of Unity.
- Among the world's largest concrete

gravity dams.

3. Benefits

- Irrigation: about 18 lakh ha in Gujarat and 2.46 lakh ha in Rajasthan.
- Drinking water to thousands of villages and towns.
- Hydropower generation: 1,450 MW.
- Power sharing: Madhya Pradesh 57%, Maharashtra 27%, Gujarat 16%.

Part III: Narmada Water Disputes Tribunal (NWDT)

1. Background

- Constituted in 1969 under the Inter-State Water Disputes Act, 1956.

2. NWDT Award (1979)

Water Allocation:

- Madhya Pradesh – 18.25 MAF
- Gujarat – 9.00 MAF
- Rajasthan – 0.50 MAF
- Maharashtra – 0.25 MAF

Hydropower Sharing:

- Madhya Pradesh – 57%
- Maharashtra – 27%
- Gujarat – 16%
- Rajasthan – No share

3. Institutional Mechanisms

- Narmada Control Authority (NCA).
- Review Committee headed by Union Jal Shakti Minister.

Part IV: Major Challenges

1. Financial disputes over land acquisition, R&R, compensation and maintenance.
2. Operational disputes over River Bed Power House (RBPH) and reservoir operations.
3. Social & environmental concerns:
   - Narmada Bachao Andolan led by Medha Patkar.
   - Displacement, rehabilitation and environmental issues.
   - World Bank withdrew funding in 1993.
   - Supreme Court permitted construction subject to rehabilitation.

Part V: Significance

- Strengthens cooperative federalism.
- Resolves decades-old financial disputes.
- Improves project implementation.
- Creates a model for future inter-state water dispute settlements.

Brief Conclusion

The 2026 settlement on the Sardar Sarovar Project resolves longstanding financial disputes while preserving the NWDT water- and power-sharing framework. It is an important example of cooperative federalism, enabling smoother project implementation and providing a model for consensus-based resolution of inter-state river disputes.

Previous Year Question (Prelims)

Q. Consider the following statements regarding the Narmada Water Disputes Tribunal (NWDT) Award:

1. The NWDT was constituted under the Inter-State Water Disputes Act, 1956.
2. The NWDT Award of 1979 determined water-sharing among Gujarat, Madhya Pradesh, Maharashtra and Rajasthan.
3. The Award also specified hydropower sharing from the Sardar Sarovar Project.

Which of the above are correct?

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

Answer: (d)

Why in News?

India has reported its first confirmed detection and genetic characterisation of Parrot Bornavirus 4 (PaBV-4), highlighting a previously undocumented threat to captive and exotic birds in the country. This discovery raises significant concerns for the exotic pet industry and conservation breeding programmes.

Part I: Understanding Parrot Bornavirus 4 (PaBV-4)

About PaBV-4

- Belongs to the genus Orthobornavirus within the Bornaviridae family.
- Infects psittacine birds such as parrots, parakeets, macaws, cockatoos, cockatiels, budgerigars, and lovebirds.

Classification of Parrot Bornaviruses

- Based on genome sequences, eight PaBV genotypes are identified.
- Grouped into two clades:
- Alphapsittaciforme: Comprising PaBV-1 to PaBV-4, PaBV-7, and PaBV-8.

- Betapsittaciforme: Comprising PaBV-5 and PaBV-6.

Associated Disease

- PaBVs are the causative agents of Proventricular Dilatation Disease (PDD).
- PDD is a serious neurological and digestive disorder.
- Symptoms include weight loss, regurgitation, weakness, poor coordination, behavioural changes, and death.

Part II: Findings of the Study

1. Detection Rate

- PaBV-4 was detected in 44 of the 83 birds tested.
- 88% of birds that had died from PDD tested positive for PaBV-4.
- 19% of apparently healthy birds also tested positive for the virus.

2. Global Link

- Genetic sequencing showed close similarity with PaBV-4 strains reported in the United States, Canada, Israel, Japan, and South Korea.
- This suggests possible spread through international bird trade.

3. Significance of Findings

- Detection of the virus in healthy-looking birds indicates asymptomatic transmission.
- Raises concerns for the exotic pet industry and conservation breeding programmes.
- Underlines the need for quarantine, regular screening, veterinary care, clean enclosures, stronger biosecurity, and improved avian disease surveillance.

Part III: Implications and Way Forward

Public Health Concern

- Bornaviruses have zoonotic potential, though PaBV-4 is primarily an avian pathogen.
- Requires monitoring of cross-species transmission risks. Trade and Biosecurity
- International bird trade is a potential pathway for introduction.
- Strengthened quarantine protocols at entry points are needed.

Conclusion

The first confirmed detection of Parrot Bornavirus 4 in India represents a critical alert for avian health, biosecurity, and conservation. With 88% mortality in affected birds and 19% of healthy birds carrying the virus, asymptomatic transmission poses a hidden threat to captive and wild psittacine populations. The genetic similarity to strains from multiple continents points towards international trade as a likely route of introduction. Immediate actions must include enhanced quarantine protocols, routine screening of exotic birds, improved veterinary care, and capacity building for avian disease surveillance. For India's growing exotic pet industry and conservation breeding efforts, this discovery necessitates a proactive, scientifically-driven response to prevent widespread outbreaks and safeguard avian biodiversity.

Previous Year Question (Prelims)

Q. With reference to 'Proventricular Dilatation Disease' sometimes seen in the news, which of the following statements is/are correct?

1. It is a neurological and digestive disorder affecting psittacine birds.
2. It is caused by a virus belonging to the Bornaviridae family.
3. It has been eradicated globally due to successful vaccination campaigns.

Select the correct answer using the code given below:

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

Answer: (b) 1 and 2 only