
Prelims Exam Topics

PRAMBANAN TEMPLE

Context:

The Prime Minister of India and the Indonesian President inaugurated an international conservation and restoration project at the **Prambanan Temple Compounds in Indonesia**.

About Prambanan Temple

- Prambanan, also known locally as **Roro Jonggrang (Loro Jonggrang)**, is the **largest Hindu temple complex in Indonesia** and one of the largest in **Southeast Asia**.
- It is regarded as the finest example of **classical Shaivite temple architecture** in the region.
- Located along the border of the **Special Region of Yogyakarta** and **Central Java**.
- **The temple was** built around **850 CE** during the reign of the **Sanjaya Dynasty** (8th–9th centuries CE).
- Temple walls feature detailed stone carvings depicting scenes from the **Ramayana** and **Bhagavata Purana**.
- **The temple was** built using **dry interlocking stone masonry** without mortar, enhancing resistance to earthquakes.
- Declared a **UNESCO World Heritage Site** in **1991** and designated a **National Cultural Property of Indonesia** in **1998**.

BRAHMOS MISSILE SYSTEM

Context:

During Prime Minister **Narendra Modi's** visit to **Indonesia**, the two countries signed agreements expressing Indonesia's intent to procure **BrahMos** missiles from India.

About the BrahMos Missile System

BrahMos is a **supersonic cruise missile** capable of flying at speeds of around **Mach 2.8–3**, making it one of the fastest cruise missiles currently in service.

Multi-Platform Launch Capability: The missile can be launched from multiple platforms:

- Land-based mobile launchers
- Warships and submarines

- Combat aircraft such as the **Sukhoi Su-30MKI**
- Coastal defence batteries

Operational Range and Precision

- BrahMos has a range of around **290–500 km depending on variants**, and is equipped with advanced guidance systems enabling **high precision strikes against land and maritime targets**.

Key Weapon of the Indian Armed Forces: The missile is deployed across all three services of the Indian military:

- **Indian Army** – land-attack missions
- **Indian Navy** – anti-ship warfare
- **Indian Air Force** – air-launched strike capability

Future Developments

- **Next-Generation BrahMos:** India and Russia are reportedly working on an upgraded **BrahMos-II hypersonic missile**, expected to achieve speeds above Mach 5.
- **Expansion of Export Markets:** India is actively negotiating further export deals with multiple countries, which could significantly expand its global presence in the defence market.

MISSION DRISHTI

Context:

Bengaluru-based space start-up **GalaxEye** announced that communication with **Mission Drishti** has been lost.

About Mission Drishti

- **Mission Drishti** is a **190-kg Earth observation satellite** developed by Bengaluru-based space start-up **GalaxEye**.
- **Launch Vehicle:** **SpaceX Falcon 9**.
- It is the **world's first operational OptoSAR satellite**, integrating **Electro-Optical (EO)** and **Synthetic Aperture Radar (SAR)** sensors on a single satellite platform.
- To develop an **indigenous all-weather Earth observation capability** for uninterrupted monitoring of land and maritime regions.

HIMALAYAN YAK

Context:

Scientists have developed an **Internet of Things (IoT)-based smart collar** to monitor high-altitude Himalayan yaks.

About the Himalayan Yak

- The **Himalayan Yak** is a domesticated, long-haired bovine species, adapted to cold, high-altitude environments and provides **milk, meat, fibre, dung (fuel), and transport** to Himalayan communities.
- Found in **high-altitude alpine regions** between **8,000 and 18,000 feet**.
- Females live in herds, while adult males are generally solitary except during the breeding season.
- **IUCN Red List: Vulnerable (VU)**
- **Indian WildLife (Protection) Act of 1972: Schedule II**
- **CITES: Appendix I**

NARMADA RIVER

Context:

Madhya Pradesh, Gujarat, Rajasthan, and Maharashtra governments reached an agreement on pending issues related to the Narmada Project.

About the Narmada River

- The **Narmada River** is the **largest west-flowing river** in peninsular India.
- **Origin: Narmada Kund** at **Amarkantak** in the **Maikal Hills, Madhya Pradesh** (about **1,057 m** above sea level).
- Flows west through **Madhya Pradesh, Maharashtra, and Gujarat**, before emptying into the **Arabian Sea** through the **Gulf of Khambhat**.
- Flows through a **rift valley (graben)** between the **Vindhya Range** (north) and the **Satpura Range** (south).
- Forms an **estuary**, not a delta, due to limited sediment deposition.
- Notable waterfalls include:
 - **Kapildhara Falls** (near Amarkantak)
 - **Dhuandhar Falls** (near Jabalpur)

- The **Sardar Sarovar Project** is one of the largest multipurpose river valley projects on the Narmada.

Major Tributaries

- **Left-bank:** Tawa (largest), Banjar, Sher, Shakkar, Dudhi, Ganjal, Chhota Tawa, Goi, Karjan.
- **Right-bank:** Hiran, Barna, Kolar, Kanar, Man, Uri, Orsang.

LEUCINE

Context:

Researchers have found that **leucine**, a branched-chain amino acid (BCAA), acts as a protective shield by preventing the premature breakdown of proteins in the **outer mitochondrial membrane**, helping maintain healthy mitochondrial function.

About Leucine

- **Leucine** is an **essential amino acid**, meaning it cannot be synthesized by the human body and must be obtained through the diet.
- It belongs to the **Branched-Chain Amino Acids (BCAAs)** family, along with **isoleucine** and **valine**.
- Supports **muscle growth**, **tissue repair**, and **energy production**.

Branched-Chain Amino Acids (BCAAs)

- BCAAs consist of **Leucine, Isoleucine and Valine**
- They are **essential amino acids** and must be obtained through food. They play a key role in **protein synthesis**, muscle metabolism, and tissue repair.

PERFORMANCE GRADING INDEX (PGI)

Context:

The **Ministry of Education** has released the **Performance Grading Index (PGI) 2.0 for States/UTs (2025–26)** and the **Performance Grading Index for Districts (PGI-D)**.

About Performance Grading Index (PGI)

- **PGI** is an assessment framework developed by the **Department of School Education & Literacy (DoSEL)**, **Ministry of Education**.

- It evaluates the performance of **States/UTs and districts in school education** using a common set of indicators.
- It aims to promote **evidence-based policymaking** and encourage improvement through performance-based grading.

PGI 2.0 (States/UTs)

- Assesses States and Union Territories on a **1,000-point scale** using **70 indicators**.
- Covers **2 categories**:
 - **Outcomes**
 - **Governance & Management**
- The indicators are grouped into **6 domains**:
 - Learning Outcomes & Quality
 - Access
 - Infrastructure & Facilities
 - Equity
 - Governance Processes
 - Teacher Education & Training
- Uses data from **UDISE+**, **PARAKH Rashtriya Sarvekshan**, **PM POSHAN**, **PRABANDH**, and **Vidyanjali** portals.

Performance Grading Index for Districts (PGI-D)

- Measures the performance of districts on a **600-point scale** using **70 indicators**.
- Covers key areas such as **learning outcomes, infrastructure, digital learning, school safety, governance, and teacher availability**.
- Based on data from **UDISE+**, **PARAKH Rashtriya Sarvekshan**, and the **PRABANDH Portal**.

KWAR HYDROELECTRIC PROJECT

Context:

Heavy rainfall recently triggered a major landslide near the under-construction **540 MW Kwar Hydroelectric Project**.

About the Kwar Hydroelectric Project

- The **Kwar Hydroelectric Project** is a **540 MW** hydropower project being developed on the **Chenab River** in **Kishtwar district, Jammu & Kashmir**.
- It is designed as a **Run-of-the-River (RoR)** project, generating electricity without creating a large storage reservoir.

NORWEGIAN SEA

Context:

UK fighter jets recently intercepted a Russian maritime patrol aircraft after it repeatedly approached a carrier strike group operating in the **Norwegian Sea**.

About the Norwegian Sea

- The Norwegian Sea is a **marginal sea of the Arctic Ocean**, located between the **North Atlantic Ocean** and the **Arctic Ocean**.
- The sea is bounded by **Norway (east)**, **Iceland (west)**, **Greenland (northwest)**, and the **Barents Sea (northeast)**. It is separated from the **Greenland Sea** by the **Jan Mayen Ridge**.
- It serves as an important transition zone between **boreal** and **Arctic** climatic regions.
- Formed due to the separation of the **Eurasian Plate** and the **North American Plate**.
- The **warm North Atlantic Current** and cold **East Iceland Current** meet here, creating **rich fishing grounds**.



Mains Exam Topics

INDIA-INDONESIA RELATIONS

Context:

The Prime Minister of India paid a **State Visit to Indonesia**, during which both countries adopted a **Joint Statement** to strengthen their **Comprehensive Strategic Partnership** across defence, maritime security, trade, digital technology, connectivity, and multilateral cooperation.

Why is Indonesia Significant to India?

- **Geostrategic Positioning and Maritime Chokepoints:** Indonesia sits at the junction of the Indian and Pacific Oceans and controls key maritime chokepoints, making it indispensable for India's Indo-Pacific strategy and maritime security.
 - E.g., Cooperation on **Sabang Port**, the **India-Indonesia Shared Vision on Maritime Cooperation (2018)**, and proximity to the **Malacca, Sunda, and Lombok Straits**.
- **Resource Security and Supply Chain Resilience:** Indonesia is India's largest trading partner in ASEAN and a reliable source of critical resources essential for energy security and the green transition.
 - E.g., Bilateral trade stood at **US\$28.4 billion (2024-25)**, along with imports of **coal, palm oil, and nickel** for EV battery manufacturing.
- **Indo-Pacific Security Architecture:** India and Indonesia cooperate to maintain a Free, Open and Inclusive Indo-Pacific (FOIP) by strengthening maritime security, combating piracy, and ensuring freedom of navigation.
 - E.g., **Coordinated Patrols (CORPAT)**, **Samudra Shakti** naval exercise, defence cooperation, and collaboration through **IORA, ADMM-Plus**, and the **East Asia Summit**.
- **Institutional Synergy and Global South Leadership:** As leading democracies and emerging economies, both countries strengthen ASEAN centrality while promoting a more representative and multipolar global order.
 - E.g., Cooperation through **ASEAN**, the **East Asia Summit**, **Indian Ocean Rim Association (IORA)**, and successive **G20 presidencies** (Indonesia in 2022 and India in 2023).
- **Blue Economy and Civilisational Partnership:** Shared maritime interests and centuries-old cultural links provide a strong foundation for long-term strategic cooperation.

- E.g., Collaboration in **marine conservation, fisheries, coastal resilience**, and cultural diplomacy through the **Ramayana tradition, Bali, and Prambanan Temple**.

What Are the Major Challenges in India–Indonesia Relations?

- **Trade Imbalance and Market Access Barriers:** Despite strong trade volumes, bilateral trade remains commodity-driven, while non-tariff barriers (NTBs) restrict greater market access for Indian exports.
 - E.g., Bilateral trade declined to around **US\$28.4 billion (2024–25)**, with India's exports facing barriers in **pharmaceuticals, IT services, and agricultural products**.
- **Connectivity and Project Implementation Challenges:** While both countries have agreed to strengthen maritime connectivity, timely execution of strategic infrastructure projects remains a challenge.
 - E.g., The **Sabang Port and Andaman–Aceh connectivity initiative** requires faster implementation through streamlined approvals, environmental clearances, and infrastructure development.
- **Defence Industrial Cooperation:** Defence cooperation has expanded substantially, but collaboration must evolve beyond arms exports towards co-development, co-production, and technology partnerships.
 - E.g., Following **BrahMos** and **Astra Mk-1 missile** agreements, greater cooperation is needed in defence manufacturing and technology transfer.
- **Regulatory and Investment Constraints:** Complex regulatory procedures and policy uncertainties continue to affect bilateral investment and private-sector participation.
 - E.g., Indian companies face challenges relating to licensing, compliance requirements, and investment approvals in Indonesia.
- **Institutional Constraints within ASEAN:** ASEAN's consensus-based decision-making often limits coordinated responses to regional security challenges, affecting broader Indo-Pacific cooperation.
 - E.g., Divergent ASEAN positions on the **South China Sea** reduce the scope for collective maritime initiatives.
- **Limited People-to-People and Knowledge Partnerships:** Educational, tourism, research, and innovation exchanges remain below their potential despite strong civilisational ties.

- E.g., Student mobility, academic collaborations, and start-up partnerships remain relatively modest compared to the strategic relationship.

How Can India and Indonesia Deepen Their Strategic Partnership?

- **Strengthen Security and Defence Integration:** Build on recent defence agreements by transitioning from a buyer–seller relationship to long-term defence industrial cooperation and integrated maritime security.
 - E.g., Establish **Maintenance, Repair and Overhaul (MRO)** hubs for **BrahMos** and **Astra Mk-1** systems, while leveraging Indonesia's **International Liaison Officer (ILO)** at **IFC-IOR** for real-time Maritime Domain Awareness (MDA) and coordinated responses in the Andaman Sea.
- **Accelerate Trade and Supply Chain Integration:** Reduce market access barriers while building resilient supply chains in critical sectors essential for future economic growth.
 - E.g., Fast-track the **ASEAN–India Trade in Goods Agreement (AITIGA) Review**, integrate Indonesia's **nickel reserves** with India's **PLI Scheme** for EV manufacturing, and expand **government-to-government pharmaceutical cooperation** based on the **Jan Aushadhi** model.
- **Develop the Andaman–Aceh Maritime Growth Corridor:** Translate recent strategic commitments into an integrated maritime, logistics, and economic corridor connecting the eastern Indian Ocean.
 - E.g., Operationalise the **Sabang Port–Andaman connectivity initiative** through port infrastructure, coastal economic zones, tourism, and multimodal logistics.
- **Scale Digital and Frontier Technology Partnership:** Leverage India's digital public infrastructure and frontier technologies to build trusted and inclusive digital ecosystems.
 - E.g., Expand the **Indonesia Open Network (ION)** based on India's **ONDC** architecture, operationalise **UPI–QRIS** cross-border payments, and strengthen space cooperation through Indonesia's **Biak tracking station** for **Gaganyaan**.
- **Promote Blue Economy and Global South Leadership:** Deepen cooperation on sustainable ocean governance while jointly advancing the interests of developing countries in global forums.
 - E.g., Strengthen collaboration under the **Indo-Pacific Oceans Initiative (IPOI)** and **Indian Ocean Rim Association (IORA)** on marine conservation, disaster resilience, sustainable fisheries, and coordinated initiatives through the **G20** and **BRICS**.