

## CHINA MEGA DAM ON BRAHMAPUTRA: GEOGRAPHY

**NEWS:** Explained: China's mega dam on Brahmaputra & concerns in India

### WHAT'S IN THE NEWS?

China has started constructing the world's largest hydropower dam on the Yarlung Zangbo (Brahmaputra) near Arunachal Pradesh, aiming to generate 60,000 MW. This raises major ecological, strategic, and diplomatic concerns for downstream countries like India and Bangladesh.

### Overview of the Tsangpo (Brahmaputra) Hydropower Project

- **Project Location:**  
The dam is being constructed in **Medog County, Tibet**, near the **Great Bend** of the Yarlung Zangbo River, close to the **Arunachal Pradesh** border.
- **Strategic Importance of the Location:**  
This stretch witnesses a dramatic drop (~2,000 meters), providing ideal hydrological conditions for **high-capacity hydropower generation**.
- **Scale of the Project:**  
It is set to become the **world's largest hydropower project**, aiming to generate **60,000 MW**, which is **thrice the capacity of the Three Gorges Dam**, China's current largest dam.
- **River Flow Control:**  
The project will give China **unprecedented control** over the flow of the **Siang/Brahmaputra River**, before it enters **India (Arunachal Pradesh)** and **Bangladesh**.

### Brahmaputra River: Course and Nomenclature

- **Origin:**  
The Brahmaputra originates as **Yarlung Tsangpo** in the **Tibet Autonomous Region of China**.
- **Course in India:**
  - Enters India through **Arunachal Pradesh** as **Siang or Dihang**.
  - Flows through **Assam** as the **Brahmaputra**.
  - Enters **Bangladesh** as **Jamuna**, then merges with the **Padma** (Ganga in Bangladesh), and finally joins the **Meghna River** before draining into the **Bay of Bengal**.
- **Different Names in Different Regions:**
  - **Yarlung Zangbo Jiang** – In China
  - **Tsangpo** – Upper Tibetan stretch, meaning "The Purifier"
  - **Siang/Dihang** – In Arunachal Pradesh (India)
  - **Brahmaputra** – In Assam (India)
  - **Jamuna** – In Bangladesh

- **Padma and Meghna** – Final confluence and stretch in Bangladesh



### Concept of Riparian States

- **Upper Riparian State:**
  - A country located at the **upstream end** of a river.
  - Has **geographical and strategic control** over the river's origin and initial flow.
  - Example: **China** is the upper riparian state for the Brahmaputra.
- **Lower Riparian State:**
  - A country located **downstream** of the river.
  - Is **dependent** on the flow released by the upper riparian.
  - Examples: **India and Bangladesh**.

### Implications of the Dam Project on India and Bangladesh

#### Weaponising Water Resources

- China's ability to control water flow can be used as a **strategic tool** against India.
- Sudden release of water during monsoons could lead to **flash floods** in Assam and Arunachal Pradesh.
- During dry seasons, **withholding water** can cause **drought-like conditions**, harming agriculture and ecology.
- Proximity of the dam to **disputed India-China border** adds a **geopolitical dimension**, increasing its **strategic significance**.

## Agricultural Impact

- **Reduced Water Availability:** Can adversely affect **irrigation systems** in the Northeast.
- **Livelihood Threat:** Farmers in **Arunachal Pradesh and Assam**, who rely on Brahmaputra's waters, may face **crop failures**, food insecurity, and economic stress.

## Seismic Risks

- The dam is located in a **seismically active region** of the **Himalayas**.
- In the event of an earthquake, there is a risk of **dam breach**, which could cause **catastrophic floods downstream**.

## Ecosystem and Biodiversity Concerns

- Altered flow regimes can disturb the **ecological balance** of wetlands, **aquatic species**, and **riparian forests**.
- Could affect **fish migration**, reduce sediment flow, and degrade **wetland fertility** in North-east India and Bangladesh.

## Diplomatic and Geopolitical Ramifications

- The unilateral construction by China **violates principles of international river cooperation**.
- Could **escalate tensions** between India and China, particularly over **transboundary water governance**.
- Bangladesh may also **raise concerns** about reduced water availability during dry seasons.

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