

Assam CM on Pakistan ‘scare narrative’: Could Chinese dams affect Brahmaputra flow in India?

How much of the Brahmaputra’s water in Assam comes from Tibet? A top water resources expert and a researcher on transboundary river systems explain.

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The Brahmaputra, lifeline of Assam and Arunachal Pradesh, originates as Yarlung Tsangpo in Tibet and enters India near Gelling in Arunachal Pradesh. (Wikimedia Commons)

To counter “Pakistan’s scare narrative” about Chinese dams on the Brahmaputra, Assam Chief Minister Himanta Biswa Sarma has pointed out that “65-70% [of the Brahmaputra’s flow] is

generated within India, and “even if China were to reduce water flow..., it may actually help... mitigate the annual floods in Assam...”.

The Brahmaputra, lifeline of Assam and Arunachal Pradesh, originates as Yarlung Tsangpo in Tibet and enters India near Gelling in Arunachal Pradesh. The river, which is called Siang in Arunachal, is joined by many tributaries in Assam as it flows down the plains before entering Bangladesh, where it is called Jamuna.

What interventions does China plan?

India has been monitoring [Chinese infrastructure interventions](#) on the river. Most are hydropower projects with minimal storage, and are located far upstream of Arunachal Pradesh, with no significant impact in Arunachal or Assam.

A major concern is the planned Medog (or Motuo) Hydropower Project, a massive dam in Medog County near the ‘Great Bend’ where the river makes a U-turn and plunges into a canyon before entering Arunachal Pradesh.

Explained | Why China is building the world’s largest dam on the Tsangpo, how India may be impacted

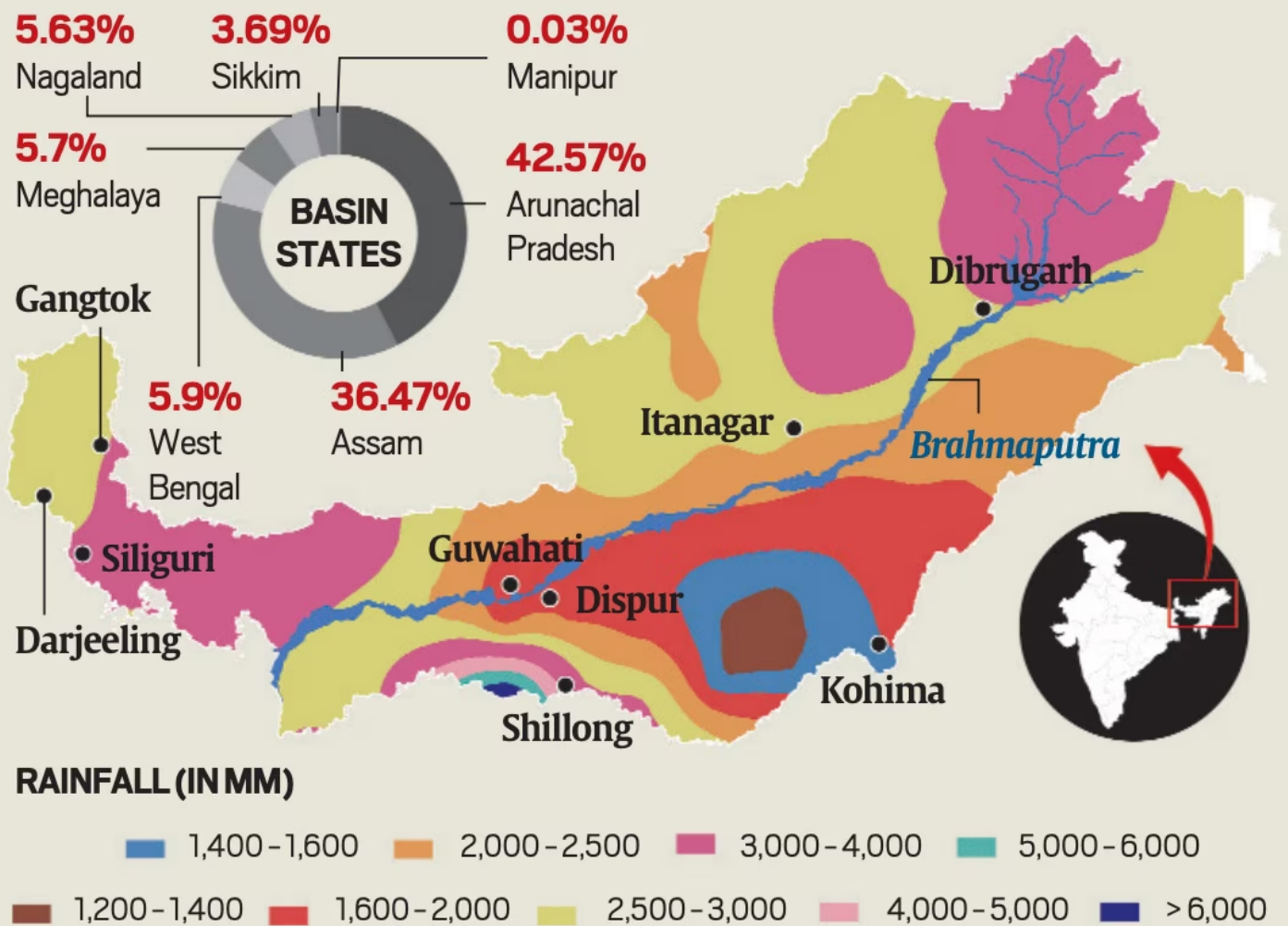
According to reports, the planned 60,000-MW Medog project will be the world’s largest hydropower facility, with a generation capacity three times that of the Three Gorges Dam on the Yangtze, currently the world’s largest hydropower station.

Not many details of the Medog project are available, but it is unlikely to have a large storage component that would have a major impact downstream.

Concerns have also been raised over China’s massive, multi-decade South-North Water Diversion (SNWD) project, the Western Route of which apparently involves diverting water from the Yarlung Tsangpo (and other rivers) to the country’s dry northern regions. However, no official sources or studies are available on these reported plans.

RAINFALL IN THE BRAHMAPUTRA BASIN

The Brahmaputra Basin in India sprawls over 1.94 lakh sq km from Arunachal Pradesh in the east to Sikkim in the west



RIVERS SWOLLEN BY THE MONSOON

No part of the Brahmaputra basin in India receives less than 1,200 mm of rain annually. This is four times the average rainfall over the Tibetan Plateau, where the Brahmaputra flows before entering India in Arunachal Pradesh.

Source: The River Basin Atlas of India prepared by CWC and ISRO National Remote Sensing Centre under the Water Resources Information System (India-WRIS) project.

Brahmaputra basin.

How much of the Brahmaputra's water yield is generated in India?

Official Indian estimates suggest that although the portion in India constitutes only 34.2% of the total basin area, it contributes to more than 80% of the Brahmaputra's yield, making the Tibet Autonomous Region a minor contributor to the basin's overall yield.

Read | ‘If China were to reduce Brahmaputra water flow...’: Himanta’s detailed ‘response to Pak’s scare narrative’

This is because the Tibetan Plateau is a region of scanty rainfall, of the order of 300 mm annually. By contrast, the southern part of the river basin in India receives 2,371 mm of rain on average every year, and very few places receive less than 1,200 mm. (See figure)

Also, the Brahmaputra receives a number of tributaries at both its northern and southern banks. The yield of the river system is increased significantly by the annual monsoon from June to September. Many of the Brahmaputra’s tributaries also receive considerable contributions from snowmelt, mostly in the Indian catchment area.

To what extent can upstream interventions reduce the Brahmaputra’s flow?

Based on available information, and given the contributions from the Brahmaputra’s tributaries and the monsoon rain in Indian territory, no significant impact is expected overall.

However, changes in the river’s flow patterns can impact hydropower projects planned on the Siang during the lean period and during peak power production.

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As a mitigation strategy, India could plan storage on rivers of the Brahmaputra system to absorb the variations in flows (periods of flooding and reduced flows). The Upper Siang Project, for example, will not only generate power, its storage can also serve as a buffer against variations in flows.

Risks of flooding may also arise from intentional or unintentional operation of reservoirs in Tibet, as well as unforeseen events such as dam failure, landslides, or earthquakes.

Upstream interventions have the potential to affect the river morphology, with consequences for riverine flora and fauna.

How is India using the water potential of the Brahmaputra system?

The Brahmaputra and its tributaries carry more than 30% of the country’s total water resources potential, and 41% of the total hydropower potential, as per estimates in the CWC-[ISRO](#) Brahmaputra Basin Atlas.

However, hydropower in Arunachal Pradesh is the only significant planned use. The utilisation of potential has been slow due to difficulties of land acquisition and concern over the submergence of forest lands, etc.

The National Water Development Authority has proposed two links to connect the Brahmaputra and its tributaries to the Ganga basin with the aim of transferring surplus water to water-scarce regions.

These are (i) the Manas-Sankosh-Teesta-Ganga Link, joining the Manas, a tributary of the Brahmaputra, to the Ganga via the Sankosh and Teesta; and (ii) the Jogighopa-Teesta-Farakka Link, joining the Brahmaputra at the planned Jogighopa Barrage to the Ganga at the Farakka Barrage.

Neither of these proposed river-linking projects are expected to be impacted in any significant way by upstream intervention in the Brahmaputra in Tibet.

Going forward, what should India do in regard to China and the Brahmaputra?

It is important for India to assess the effects by conducting detailed multi-disciplinary scientific studies, and prepare an adaptive strategy. It needs to use diplomatic channels to actively seek detailed hydrological and project-related data to continuously assess the downstream impact of Chinese infrastructure interventions.

India should also work to develop comprehensive data sharing protocols with China for advance warning and disaster preparedness.

Could Chinese dam-building activity interfere with flows in the Indus river system, specifically the flow of the Sutlej?

Both the Sutlej and Indus originate in Tibet, and China has planned and executed hydropower projects on these rivers in Tibet.

The large reservoir at Bhakra (Gobind Sagar) in Bilaspur, Himachal Pradesh, can absorb variations in the flow of the Sutlej, even though there can be some impact on the generation pattern of hydropower projects such as Nathpa Jhakri.

On the Indus, India does not have significant consumptive use. However, there may be some impact on the run-of-the-river Nimoo Bazgo hydropower plant in Ladakh.

Naresh Kumar Mathur is former Member, Central Water Commission (CWC) under the Ministry of Jal Shakti. These are his personal views, based on publicly available data, and do

not represent the views of organisations with which he is/ was associated.

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