

The Yarlung Tsangpo Hydropower Project and Regional Water Dynamics: Strategic Considerations for Bangladesh

Mohosina Mostofa Mity¹

Introduction



Source: PMF IAS

The construction of the Yarlung Hydropower Project by China is going to have a massive impact on ensuring the balance of regional water dynamics in South Asia. For Bangladesh, a lower riparian nation situated at the conflux of some of the world's largest transboundary river systems, developments upstream carry considerable implications for water security, agriculture, and regional stability. As climate change intensifies the unpredictability of river flows and seasonal variations, the strategic management of shared water resources has become a central issue in the country's geopolitical calculations. The Yarlung project, though presented as a clean energy

¹Mohosina Mostofa Mity is a Research Associate at the Bangladesh Institute of Peace and Security Studies (BIPSS). She completed her BSS & MSS in International Relations from the Bangladesh University of Professionals (BUP).

initiative, sits within a broader context of hydro-political maneuvering in the region, particularly along the Brahmaputra basin, where competing national interests and limited institutional cooperation increase tensions.²

Bangladesh's dependence on transboundary rivers originating from India, China and others makes it especially vulnerable to upstream interventions. The Yarlung project's potential impact on downstream flow regimes, sediment transport, and ecological balance cannot be viewed in isolation. It forms part of a growing pattern of hydropower and infrastructure development that could reshape water-sharing arrangements and influence regional diplomacy. At a time when Bangladesh is trying hard to strengthen its climate resilience and ensure sustainable development, the evolving dynamics of river governance present both challenges and opportunities.

Understanding the strategic dimensions of the Yarlung Hydropower Project requires going beyond its technical and environmental aspects to assess its geopolitical significance. In a rapidly changing regional order where energy needs, climate adaptation, and strategic competition intersect, Bangladesh must carefully evaluate how such upstream projects affect its long-term water security, regional partnerships, and national interests. The issue of water, once seen purely as a developmental concern, is increasingly becoming a question of strategy and survival for the region at present.

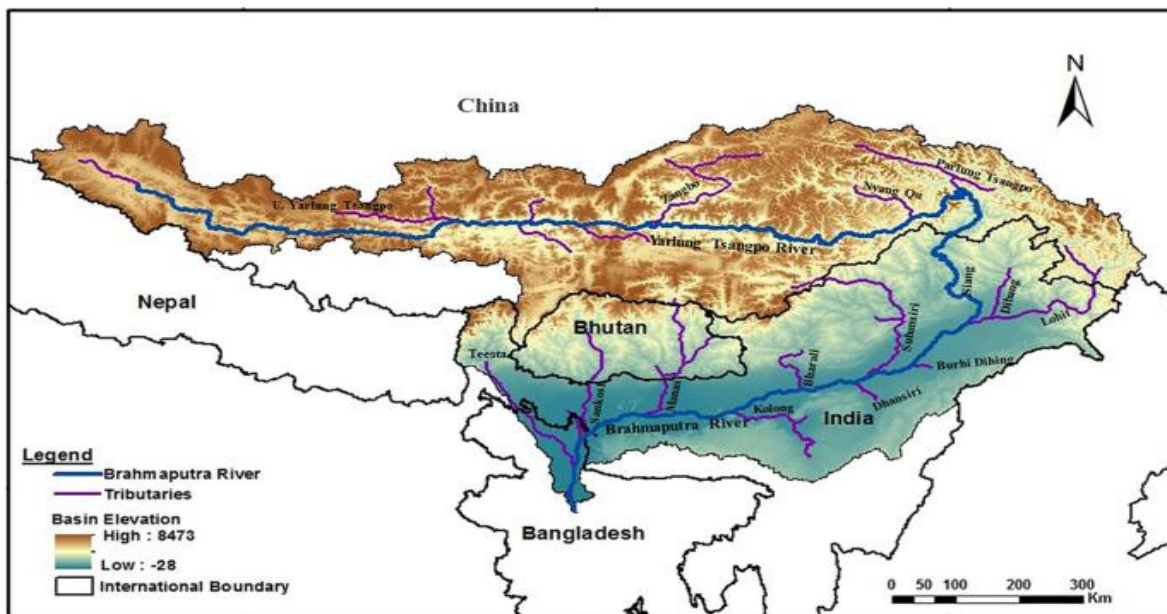
The Brahmaputra Basin: A Shared Lifeline

The Brahmaputra River, one of the world's mightiest and most complex river systems, flows through Tibet, India, and Bangladesh, linking the ecological and geopolitical destinies of these nations.³ Originating from the Chemayungdung Glacier in Tibet—where it is known as the Yarlung Tsangpo—the river flows eastward across the Tibetan plateau before turning south into India's Arunachal Pradesh, where it becomes the Siang, and later joins the Lohit and Dibang rivers to

² Jain, Roshani. 2025. "The Yarlung Zangbo Hydroelectric Project: Power at a Price." Orfonline.org. OBSERVER RESEARCH FOUNDATION (ORF). September 23, 2025. <https://www.orfonline.org/expert-speak/the-yarlung-zangbo-hydroelectric-project-power-at-a-price>.

³ "Brahmaputra River | River, Asia." 2019. In Encyclopædia Britannica. <https://www.britannica.com/place/Brahmaputra-River>.

form the Brahmaputra in Assam.⁴ It then travels westward through the fertile plains of northeastern India before entering Bangladesh as the Jamuna, eventually merging with the Ganges and Meghna rivers to form the largest delta in the world. This immense river system supports hundreds of millions of people through agriculture, fisheries, and livelihoods which makes it a lifeline for South Asia.



Source: Springer

For Bangladesh, the Brahmaputra's flow is critical to sustaining its economy and ecology. The river contributes a major share of the country's surface water, supporting irrigation, navigation, and hydrological balance.⁵ However, any alteration in the river's flow upstream—through hydropower projects, diversion, or dam construction—poses serious concerns for the downstream areas. Seasonal variations, sedimentation, and flood cycles are integral to Bangladesh's fertile deltaic ecosystem. Unilateral upstream interventions could disrupt this balance, potentially leading

⁴ "Brahmaputra River System| Tributaries of Brahmaputra River UPSC CSE." 2024. Chahalacademy.com. 2024. <https://chahalacademy.com/brahmaputra-river>.

⁵ Mosselman, Erik. 2025. "Sustainable Stabilisation of the Brahmaputra-Jamuna River in India and Bangladesh." *International Journal of River Basin Management*, May, 1–9. <https://doi.org/10.1080/15715124.2025.2499872>.

to reduced dry-season flow, changes in sediment load, and increased flood intensity during monsoons. For a deltaic nation already facing the dual threats of climate change and rising sea levels, such changes could have severe socio-economic and environmental repercussions.

China's decision to move forward with the construction of a massive dam on the Yarlung Tsangpo without prior consultation with downstream nations has added more concerns. This unilateral move has raised growing geopolitical tension across the region. The lack of transparency surrounding China's hydropower projects in Tibet has led to fears of strategic water control—where upstream storage and flow regulation could become tools of political influence.⁶ Given that the Brahmaputra originates in China and is shared with India and Bangladesh, any large-scale alteration of its natural flow could have cascading effects downstream, not just in water availability but also in regional trust and cooperation.

The situation got more complicated by the absence of an official water-sharing treaty among China, India, and Bangladesh.⁷ No comprehensive trilateral or basin-wide agreement exists for the Brahmaputra. This vacuum leaves room for misunderstanding and mistrust. Moreover, Bhutan, which also lies within the Brahmaputra basin, is indirectly affected by such projects, as changes in the hydrological regime influence its river systems and hydropower sector. The lack of coordinated water governance in this interconnected basin means that actions taken by one country resonate across borders.

Beyond national boundaries, the Brahmaputra plays a vital role in regulating broader climatic and ecological patterns across South Asia. Its flow influences regional rainfall distribution, soil fertility, and monsoon behavior—factors that are transboundary by nature and do not adhere to political borders. Any disruption to the river's natural course or sediment flow can alter weather systems, agricultural productivity, and biodiversity across multiple countries. As climate change intensifies extreme weather events, coordinated river management becomes even more essential. Without

⁶Tillman, Courtney. 2025. "China's Massive Hydropower Project in Tibet Illustrates Climate Security Risks." The Center for Climate & Security. February 4, 2025. <https://climateandsecurity.org/2025/02/chinas-massive-hydropower-project-in-tibet-illustrates-climate-security-risks/>.

⁷ Manhas, Neeraj Singh, and Hari Yadav G. 2024. "Beyond the Border: Exploring the Complex Dynamics of Water Tensions between India and China." *Discover Global Society* 2 (1). <https://doi.org/10.1007/s44282-024-00089-x>.

regional cooperation, the future of the Brahmaputra could turn from being a source of shared prosperity into a cause of competition and instability.

Is This a Risky Project?

The Medog Hydropower Project poses significant environmental and technical risks. It is one of the most complex hydropower projects ever attempted, requiring massive tunnels across the great bend of the Yarlung Tsangpo to divert water, alongside the construction of the main hydropower facility, transmission lines, roads, and other critical infrastructure. The risks are not limited to surface water; the project will also affect groundwater systems and atmospheric water cycles, including fog, mist, and local rainfall patterns. These changes threaten traditional agricultural practices, which rely on indigenous knowledge of local climate and water cycles, and could disrupt livelihoods for generations.

Besides, the project is being constructed in one of the most seismically active regions in the world—the Indo-Tsangpo Suture Zone⁸—raising the risk of earthquakes, landslides, and, in the worst-case scenario, catastrophic flooding. Furthermore, the project has the potential to alter monsoonal patterns significantly, possibly leading to drier conditions downstream and degrading fertile lands. The environmental, social, and geological consequences of this project are therefore profound, long-lasting, and multi-dimensional.

Vulnerabilities of Bangladesh

For Bangladesh, the river is not merely a physical feature. In fact, it is central to food, jobs, transport, and the shape of the delta where more than 100 million people live.⁹ The project's scale and its location on the river's upper reaches mean effects could reach Bangladesh in the form of altered flows, changed sediment loads, shifting flood patterns, and new political pressures. These

⁸ "Website Filtered." 2025. Britannica.com. 2025. <https://www.britannica.com/place/Indus-Tsang-po-Suture-Zone>.

⁹ "Implementing Bangladesh Delta Plan 2100: Key to Boost Economic Growth." 2021. World Bank Blogs. 2021. https://blogs.worldbank.org/en/endpovertyinsouthasia/implementing-bangladesh-delta-plan-2100-key-boost-economic-growth?utm_source=chatgpt.com.

impacts must be read together with past experiences and current geopolitics to understand what lies ahead.

Hydrological Control: The Medog project's capacity to store and release vast quantities of water gives China pioneering upstream influence over seasonal flows. Dry-season flows, crucial for agriculture and drinking water, could be reduced, while sudden releases during the monsoon could exacerbate flooding in northern Bangladesh. Historical precedent proves the gravity of such risks: upstream projects like India's Farakka Barrage have already caused downstream water scarcity, navigational challenges, and ecological disruptions.¹⁰ Unlike the Ganges, where Bangladesh has some bilateral agreements with India, no formal trilateral framework exists with China for the Brahmaputra, leaving Bangladesh exposed to unilateral upstream management.

Ecological and Sediment Disruption: The Brahmaputra carries immense sediment that maintains the delta's fertility and natural flood buffers. Trapping sediment upstream could accelerate riverbank erosion, weaken deltaic resilience against sea-level rise, and increase saltwater intrusion into farmland.¹¹ This would compound existing climate stressors in Bangladesh, where rising seas and erratic monsoons already threaten agriculture and rural livelihoods. The social consequences are equally stark: reduced water and fertile soil could push farmers into economic precarity, trigger internal migration, and amplify urban pressures in Dhaka, Khulna, and other cities.

Geopolitical Implications: As the most downstream nation in the river basin, Bangladesh faces a profound asymmetry: its water security, agricultural productivity, and ecological stability now depend heavily on decisions taken by upstream actors—primarily China—with limited institutional checks or binding agreements to guarantee equitable management. The unilateral nature of the project shows the latent power that upstream states can exercise through control over water flow, sediment transport, and seasonal regulation, creating potential leverage that extends beyond hydrology into political and economic influence. This dynamic not only amplifies regional tension, particularly with India, but also weakens cooperative frameworks for flood management,

¹⁰ "India and Bangladesh Conflict over the Ganges River." 1957. Climate-Diplomacy. 1957. <https://climate-diplomacy.org/case-studies/india-and-bangladesh-conflict-over-ganges-river?>

¹¹ Raff, Jessica L., Steven L. Goodbred, Jennifer L. Pickering, Ryan S. Sincavage, John C. Ayers, Md Saddam Hossain, Carol A. Wilson, et al. 2023. "Sediment Delivery to Sustain the Ganges-Brahmaputra Delta under Climate Change and Anthropogenic Impacts." *Nature Communications* 14 (1): 2429. <https://doi.org/10.1038/s41467-023-38057-9>.

climate adaptation, and sustainable river governance, exposing Bangladesh to uncertainties that are environmental, social, and strategic in nature. Furthermore, the project's long-term implications intersect with domestic stability. For example, altered flows and sedimentation threaten agriculture, fisheries, and deltaic resilience, potentially exacerbating internal migration, food insecurity, and socio-political pressures.

Strategic Implications: The strategic implications extend to long-term regional stability. The Medog project demonstrates how water infrastructure upstream can be a tool of geopolitical leverage. Water security is directly linked to agricultural productivity, food security, and urban-rural migration in Bangladesh. Any upstream manipulation, be it intentional or not, can generate cascading socio-economic pressures, intensifying internal political tensions and complicating disaster management strategies. Beyond national borders, such pressures could influence Bangladesh's foreign policy orientation, its alliance calculus with regional powers, and its broader integration into South Asian water governance frameworks.

The Shortcomings

Dhaka officially requested detailed technical documents from Beijing, including environmental and feasibility assessments, in order to understand potential impacts on downstream flows, sedimentation, and flooding patterns. This was a measured step, but beyond that, Bangladesh's approach has remained limited to expressions of concern and appeals for data sharing. Although Bangladesh's decision to accede to an international water convention in 2025 marked a positive development, the move remains largely allusive in the absence of a direct, binding framework that includes China, and also India. As of now, Beijing has not provided comprehensive documentation to Dhaka such as the environmental impact assessment, feasibility study, climate and disaster-impact reports, and Bangladesh lacks a robust diplomatic mechanism to pursue the issue further. Although the current ambassador of China in Bangladesh has verbally assured that the project will not affect downstream flow, such assurances are not sufficient—Bangladesh must still demand official documents and technical assessments to verify these claims.

This limited response reflects a deeper institutional weakness in Bangladesh's approach to transboundary water management. The country has no formal trilateral framework involving India and China to govern the Brahmaputra's use. Unlike the Indus River system, which is regulated by

the Indus Waters Treaty, or the Mekong, which has its own regional commission, the Brahmaputra basin operates without a shared governance structure.¹² This leaves Bangladesh dependent on the goodwill of upstream nations and the uncertain politics of regional relations. Moreover, China's selective participation in international water treaties, often based on its preference for bilateral arrangements rather than multilateral obligations, further limits Bangladesh's legal leverage. Dhaka's institutional framework for crisis response on water issues also remains fragmented, with different ministries working in isolation and without a coordinated, long-term strategy.

From a technical and scientific standpoint, Bangladesh faces a significant deficit in independent monitoring and modelling capacity. There is no comprehensive hydrological model that integrates the upper Brahmaputra's flow dynamics, reservoir operations, sediment transport, and climate variability. Ground-level observation networks in the upper basin are sparse, forcing Bangladesh to rely on satellite data and external reports that provide only partial accuracy. This makes it difficult for Dhaka to contest or validate China's claims about the safety and environmental management of the project.

The diplomatic limitations are equally apparent. Bangladesh's foreign policy toward both China and India has historically been guided by economic pragmatism and balancing behavior. While this approach has yielded investment, infrastructure, and political goodwill, it has also made Dhaka reluctant to press aggressively on contentious issues such as water management. The result is a cautious diplomacy that prioritizes immediate stability over long-term strategic security. By contrast, India has actively raised concerns about the Medog project through political and many other channels, seeing it as a threat to its northeastern ecosystem and national security. Bangladesh, however, has remained on the margins of this regional conversation. This type of posture prevents the country from shaping the narrative or influencing the outcome in any significant way.

Another major shortcoming is the absence of robust domestic adaptation and resilience planning. Bangladesh, despite its sufficient expertise in disaster management and climate adaptation, has yet to design a comprehensive strategy that specifically addresses transboundary water risks. The

¹² Baten, Mohammed Abdul, and Rashed Al Mahmud Titumir. 2015. "Environmental Challenges of Trans-Boundary Water Resources Management: The Case of Bangladesh." *Sustainable Water Resources Management* 2 (1): 13–27. <https://doi.org/10.1007/s40899-015-0037-0>.

Brahmaputra basin is central to Bangladesh's agricultural and ecological health, yet there is limited investment in sediment management, saline-resistant crops, and groundwater protection in northern regions that depend on its flow. A sudden alteration in water volume, flow timing, or sediment load could have serious effects—undermining irrigation, reducing soil fertility, and accelerating erosion in deltaic regions. Without large-scale adaptation measures, such disruptions could fuel rural displacement, exacerbate urban congestion, and strain the country's social fabric.

In the legal sphere, Bangladesh's options are limited but not nonexistent. While China is not bound by most multilateral water treaties, customary international law provides Bangladesh with a foundation to assert its rights. Principles such as “equitable and reasonable utilization” and the obligation to avoid “significant harm” to downstream states are widely accepted norms in international water law.¹³ There is an international court order which says that when an upstream country starts developing a hydropower project, which has an impact on the downstream country, then the downstream country can demand a joint EIA (Environmental Impact Assessment).¹⁴ Dhaka could use these principles to frame its position and build moral and diplomatic pressure. However, such legal steps would require years of preparation and strong political will, which have historically been lacking in our country.

India's Counter Strategy: Will Bangladesh's Water Security Be Caught Between Two Giants?

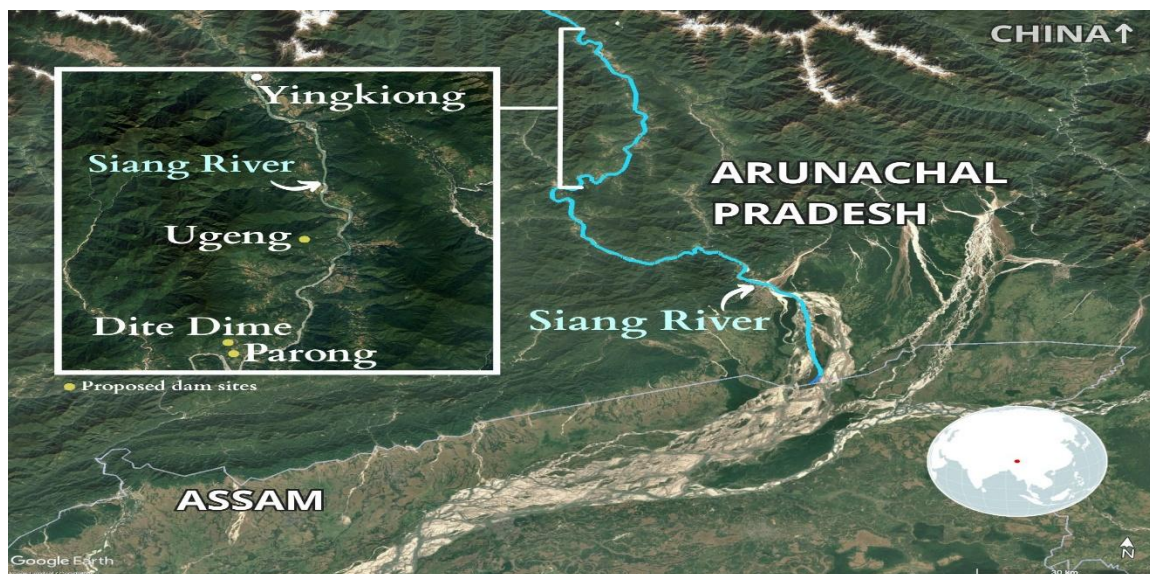
In a strategic move, New Delhi decided to build its own ambitious hydropower project — the Siang Upper Multipurpose Project (SUMP) in Arunachal Pradesh. This project, led by the National Hydroelectric Power Corporation (NHPC), is designed not only to generate huge amounts of electricity but also to assert India's control over the Brahmaputra's waters before they cross into Bangladesh.¹⁵ It is one of the largest hydropower projects ever planned in India, involving a series

¹³ “Convention on the Law of the Non-Navigational Uses of International Watercourses - Main Page.” 2025. Un.org. 2025. https://legal.un.org/avl/ha/clnuiw/clnuiw.html?utm_source=chatgpt.com.

¹⁴ “TOWARDS a FRAMEWORK for TRANSBOUNDARY EIAs in SOUTH ASIA Policy Brief.” n.d. Accessed November 4, 2025. https://www.internationalrivers.org/wp-content/uploads/sites/86/2020/07/framework_for_transboundary_eia_in_south_asia.pdf

¹⁵ PTI. 2025. “Siang Upper Multipurpose Project in Arunachal Is Strategic Necessity Rijiju.” The Week. June 10, 2025. https://www.theweek.in/wire-updates/national/2025/06/10/cal15-ar-rijiju.html?utm_source=chatgpt.com.

of massive dams across the Siang River, which originates from the same Tibetan plateau as the Yarlung Tsangpo. India's goal is to counter China's upstream influence and ensure that it can manage the river flow within its own territory. At the same time, it aims to strengthen its strategic position in the eastern Himalayas and reinforce its claim over Arunachal Pradesh, which China still disputes. The project also serves India's energy and flood management goals, but beneath these practical reasons lies a strong message of strategic resilience. However, the plan has sparked protests in Arunachal Pradesh, where local communities fear the destruction of forests, cultural heritage, and fragile mountain ecosystems.¹⁶ Despite the controversy, India seems determined to move forward.



Source: Mongabay-India

Meanwhile, Bangladesh's water security is increasingly being shaped by a quiet yet evident geopolitical contest between India and China, both seeking greater control over shared transboundary rivers. Both the Chinese and the Indian projects reflect more than just efforts to generate energy—they represent strategic moves in a broader competition for regional influence.

¹⁶ Our Web Desk. 2025. "Why a Project of 'Strategic Necessity' Is Triggering Protests in Arunachal's Upper Siang." Telegraphindia.com. Telegraph India. June 10, 2025. https://www.telegraphindia.com/india/why-a-project-of-strategic-necessity-is-triggering-protests-in-arunachals-upper-siang-district/cid/2107133?utm_source=chatgpt.com.

Amidst this rivalry, Bangladesh, as the most downstream country, finds itself caught in the middle, with little say in decisions that could deeply affect its environment and economy. The reality is that both China and India seem more focused on advancing their national interests and strengthening their regional influence, while the long-term ecological and humanitarian implications downstream appear to receive comparatively less attention. For Bangladesh, this poses serious risks: potential changes in river flow, sediment patterns, and seasonal water availability could impact agriculture and livelihoods. Yet, in the absence of a cooperative water-sharing framework among the three nations, Bangladesh's capacity to safeguard its interests remains limited. The emerging pattern suggests that water is becoming less a shared resource and more a strategic instrument—leaving Bangladesh to face the difficult balance between two competing powers.

India's Upper Siang project can significantly harm Bangladesh by altering the river's natural flow. As the Brahmaputra enters Bangladesh as the Jamuna, any diversion or storage of water upstream may reduce dry-season flow, affecting irrigation, fisheries, and navigation. Sudden water releases could also worsen floods during monsoon seasons. This project, built primarily for India's energy and strategic needs, gives New Delhi greater control over a transboundary river system that Bangladesh depends on. Bangladesh's water security, agriculture, and riverine livelihoods can face severe long-term risks from these upstream interventions.

Bangladesh is already vulnerable due to China's Medog project upstream. The SUMP adds a second layer of upstream control, which means Dhaka could face compounded impacts without any binding multilateral water-sharing agreement.

Way Forward

Bangladesh needs to strengthen its scientific and technical capacity to monitor river systems that originate beyond its borders. The country has long depended on secondary data provided by other countries which limits its ability to make independent assessments. Institutions like the Institute of Water Modeling (IWM) and the River and Delta Research Centre (RDRC) already exist in Bangladesh. But their capacities and resources need to be further strengthened. Establishing a national transboundary river research and data center, equipped with advanced hydrological modeling, satellite monitoring, and climate forecasting tools, would allow Bangladesh to

accurately predict and respond to upstream activities. Collaboration with international research institutions and global climate organizations could further strengthen these efforts. Reliable data will empower the government to negotiate more effectively and to present scientifically backed concerns in regional and global forums.

Besides, Bangladesh can go for a multi-layered diplomatic strategy that includes both bilateral and multilateral engagement. While continuing to engage India and China through official diplomatic channels, Bangladesh should also raise the issue in broader platforms. The objective should not be confrontation but to institutionalize cooperation over shared rivers through legally binding frameworks or regional river basin commissions. Internationalizing the discussion will create moral and diplomatic pressure on both upstream countries to adopt transparency and environmental accountability.

Most importantly, Bangladesh must adopt a non-aligned but pragmatic stance in its regional diplomacy. Given that the water issue is becoming intertwined with the India-China rivalry, aligning too closely with one side could limit Bangladesh's flexibility. Instead, Dhaka should position itself as a responsible downstream stakeholder advocating for equitable and sustainable river management. By doing so, Bangladesh can maintain constructive relations with both powers while protecting its own interests. Quiet diplomacy, backed by scientific data and consistent policy messaging, will be more effective than reactive political statements.

But domestic water management also requires urgent reform. Even though upstream control remains a major factor, Bangladesh must optimize its own use of water resources. Efficient irrigation systems, rainwater harvesting, and modern river basin management could reduce internal vulnerabilities. Moreover, national policies should integrate water security with food security, energy planning, and climate resilience. This would create a comprehensive approach rather than treating the issue as an isolated environmental concern.

In terms of law, for Bangladesh, options to address China's project remain extremely limited. As there is no existing water-sharing or cooperation agreement between Bangladesh and China, Dhaka has little formal ground to demand technical information or influence Beijing's upstream actions. Any engagement must therefore rely on diplomatic channels rather than binding legal frameworks. However, Bangladesh could collaborate with India and Bhutan to form a Brahmaputra Basin Alliance—a multilateral platform aimed at promoting joint research, information sharing, and

coordinated responses. Additionally, Bangladesh could appeal under customary international law, which obligates states to avoid causing significant harm to downstream nations, and reference global conventions such as the Convention on Biological Diversity (1992), UNFCCC (1994), and the Ramsar Convention (1972) to highlight the potential environmental and ecological risks.¹⁷ Though these measures lack direct enforcement power, they could strengthen Bangladesh's diplomatic and moral standing in raising legitimate concerns about the dam's transboundary impacts.

Moreover, Bangladesh has to engage civil society, academia, and the media in awareness and advocacy. Water security is not just a foreign policy challenge; it is a national issue that affects millions of lives. Encouraging public understanding and informed debate will build pressure for long-term solutions and ensure accountability in policy decisions. We cannot afford to remain a passive observer anymore. By investing in knowledge, building alliances, and reinforcing domestic resilience, it can transform vulnerability into strength. The path forward lies not in confrontation but in smart diplomacy, scientific preparedness, and a united national vision for water security.

¹⁷ "China's Medog Dam on Yarlung Tsangpo: Legal Options and Alternatives for India and Bangladesh." 2024. Asianconfluence.org. 2024. https://www.asianconfluence.org/publication-details-full/china-s-medog-dam-on-yarlung-tsangpo-legal-options-and-alternatives-for-india-and-bangladesh?utm_source=chatgpt.com.