

Water security in China–India relations: Pathways towards green diplomacy and sustainable development

Tran Tho Quang¹⁾ , Le Hoang Kiet²⁾ , Dang Quynh Anh³⁾ , Le Thi Thanh Tam^{*4)} 

¹⁾ Communist Review, 28 Tran Binh Trong St, Hanoi, 100000, Vietnam

²⁾ VNU University of Social Sciences and Humanities, 336 Nguyen Trai St, Hanoi, 100000, Vietnam

³⁾ Hanoi National University of Education, 136 Xuan Thuy St, Hanoi, 100000, Vietnam

⁴⁾ Dong A University, 33 Xo Viet Nghe Tinh St, Da Nang, 550000, Vietnam

* Corresponding author

RECEIVED 05.12.2025

ACCEPTED 23.03.2026

AVAILABLE ONLINE 13.07.2026

Abstract: This study investigates China's hydropower and green development projects on the Brahmaputra River and their implications for India within the broader framework of hydropolitics and international relations. By situating the analysis within the context of persistent border disputes and asymmetric riparian positions, the paper highlights how water resources are being strategically mobilised to advance geopolitical objectives. The central research question posed is: Do China's hydropower projects on the Brahmaputra River reflect a negative balancing strategy aimed at eroding India's internal capabilities, and how does this affect prospects for green diplomacy and sustainable water security in the region? The study employs a qualitative analytical approach grounded in a case study research design, integrating documentary analysis of international reports, technical data, and peer-reviewed academic literature. China's upstream initiatives – encompassing dam construction and hydrological data management – consolidate Beijing's role as a hydro-hegemon, thereby exacerbating India's vulnerability as a downstream riparian state. These vulnerabilities manifest through ecological risks, livelihood insecurity in Northeast India, and escalating geopolitical friction. Drawing on realism theory, and in particular the concept of negative balancing, the study demonstrates how China's actions contribute to the erosion of India's internal resource potential and the complication of bilateral trust. Simultaneously, the paper connects these challenges to the relevant United Nations Sustainable Development Goals, thereby proposing pathways toward substantive green diplomacy and sustainable water governance in the region. The findings underscore that hydropolitics is not merely an environmental concern but a multidimensional challenge encompassing sustainability, security, and diplomacy in an inextricably intertwined manner.

Keywords: China, India, negative balancing, Sustainable Development Goals, water security

INTRODUCTION

The relationship between India and China has entered an increasingly contentious phase, marked by intensifying competition across multiple strategic domains. Among these, water has emerged as a particularly serious source of contestation, driven in large part by China's dam construction projects and associated infrastructure developments on the upper reaches of the Brahmaputra River (Kiet, Binh and Hiep, 2025). For India, the Brahmaputra constitutes the backbone of national security,

community livelihoods in the Northeast, and the broader geopolitical landscape. China, by contrast, regards the river as an indispensable component of its “green rise” strategy. India, disadvantaged by its geographic position as a downstream state, perceives these projects as systematically undermining its internal resource potential. Conflicts of interest between the two riparian states have been extensively documented in the scholarly literature – from disputes over water allocation to the politics of dam construction – with numerous scholars warning of the potential for escalation into “water wars” (Starr, 1991;

Hukil, 2013). The significance of this issue must be understood within the broader context of energy security, a factor of existential importance for national growth. Climate change, functioning as a threat multiplier, has compelled states to pursue pathways of green energy and to commit to carbon neutrality by 2060 (IEA, 2021). China's dam-building initiatives may be interpreted as part of an accelerated carbon neutrality strategy, yet they simultaneously intensify India's resource vulnerabilities. Against the backdrop of protracted bilateral tensions, hydro-political disputes further complicate trust and cooperation between the two states. At the international level, China's rise is accompanied by development ambitions that extend well beyond its own borders, consistent with realism perspectives on state behaviour. The Brahmaputra dam projects, therefore, embody both environmental and geopolitical dimensions of China's ascendancy.

This paper, however, goes beyond the mere documentation of tensions. The central research question it seeks to address is: Do China's hydropower projects on the Brahmaputra River reflect a deliberate negative balancing strategy aimed at eroding India's internal capabilities, and how does this affect prospects for green diplomacy and sustainable water security governance in the region? The paper's central argument is that hydropolitics is not simply an environmental issue, but a multidimensional challenge in which sustainability, security, and diplomacy are inextricably intertwined – and it is within that nexus that solutions to regional water security must be located. Water thus functions as a strategic asset for both states. For China, hydrological resources are tightly linked to the national power grid and a broader development agenda. The Brahmaputra projects, however, transcend domestic development, reflecting wider geopolitical ambitions in South Asia. These initiatives carry implications not only for hydro-politics but also for China's strategic posture with Northeast India. Furthermore, the transboundary character of the Brahmaputra – flowing through China, India, and Bangladesh – means that upstream activities carry consequences for all riparian states, raising urgent questions about regional water governance and human security in the broadest sense.

MATERIALS AND METHODS

THEORETICAL FRAMEWORK

The concept of water security

Before proceeding with the analysis, it is necessary to establish clearly the foundational concept of this study: water security. According to the definition widely adopted by the United Nations UN-Water, water security refers to “the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability” (UN-Water, 2013). In a transboundary context such as the Brahmaputra basin, water security is not merely a matter of domestic resource management but is also a profoundly geopolitical issue: upstream control directly shapes downstream access to water, thereby affecting food security, social stability, and even national sovereignty.

Understood in its multidimensional sense, water security encompasses at least five dimensions that are closely relevant to the present study. First, it is intrinsically linked to livelihood security and food security – water is an irreplaceable input for agriculture, particularly in societies such as Northeast India, where more than 85 per cent of cultivated area is devoted to rice cultivation (Dikshit and Dikshit, 2014). Second, water security directly influences socioeconomic and political stability, as water scarcity or erratic flooding can trigger migration, unrest, and even domestic conflict. Third, it serves as a cornerstone in sustaining peace and diplomatic relations between riparian states, where asymmetries in water control can readily become the trigger for tensions. Fourth, water security is intimately connected to the challenge of global climate change, as large-scale hydropower projects are simultaneously a response to the demand for clean energy and a potential source of irreversible ecological impacts. Fifth, water security is a prerequisite for the realisation of United Nations Sustainable Development Goal 6 (SDG 6) on clean water and sanitation, as well as a range of related SDGs that will be analysed in detail in subsequent sections.

It is important to emphasise that water security is not the concern of any single state. It is intimately bound up with the livelihoods of millions of people who depend on transboundary rivers; it shapes the socioeconomic and political stability of downstream states; it constitutes the foundation for regional peace and cooperation; and it represents one of the most pressing climate adaptation challenges of the 20th century. This is precisely why the story of the Brahmaputra transcends bilateral dispute to become a matter of global governance requiring serious attention from the international community.

Negative balancing in realism theory

This study applies the lens of negative balancing to decode the hydropolitical dynamics shaping Sino–Indian relations. Rooted in the realism tradition, negative balancing provides a critical analytical tool for understanding how states operate within an anarchic international system. Hans J. Morgenthau's classical realism positions power as the defining currency of global politics. In such a system, states cannot rely on collective cooperation but must instead depend on their own capabilities to safeguard national interests (Jütersonke, 2010). Energy security, in particular, has become a domain in which strategies are frequently pursued at the expense of rivals and the environment, reflecting the tendencies of offensive realism (Heffron, 2015). Within this framework, resources constitute not merely developmental assets but instruments of security and influence. Negative balancing, as articulated by He (2012), refers to the deliberate undermining of a rival's power rather than the augmentation of one's own. Unlike positive balancing – which emphasises the internal build-up of capabilities in response to growing threats – negative balancing is a more subtle yet equally effective strategy. It is shaped by threat perceptions directed at rival states and is increasingly deployed as a substitute for traditional alliance-building, particularly in contexts where overt action might provoke unwanted international reactions.

China's approach to water exemplifies this logic. By treating hydrological resources as levers of power maximisation, Beijing integrates water politics into its broader realism strategy. The Brahmaputra, with its immense ecological and developmental significance, has become the focal point of this contest.

China's dam projects on the river are not simply developmental undertakings; they operate as instruments of negative balancing against India, eroding India's capacity to exploit its own internal resources. As illustrated in Table 1, this paper argues that states confronting inherent geopolitical disadvantages – such as unresolved border disputes – tend to weaponise shared resources in pursuit of multiple objectives simultaneously. In the case of India and China, water becomes the medium through which environmental sustainability, livelihood security, and regional development are drawn into strategic competition. The Brahmaputra thus embodies more than a river system; it represents a contested space where realism, resource politics, and negative balancing converge to redefine bilateral and regional dynamics.

METHODOLOGY

This study employs a qualitative analytical method, specifically a comparative case study design, with the Brahmaputra basin as the primary case and the Mekong basin serving as the comparative reference case. The case study method is appropriate to the objectives of this research for several reasons. First, it allows for in-depth exploration of complex causal processes that quantitative methods are ill-equipped to capture – particularly in the domain of hydropolitics, where numerical data are frequently withheld or not transparently disclosed by the states involved. Moreover, the comparative design enables the paper to examine whether the behavioural patterns observed on the Brahmaputra are specific to Sino-Indian relations or reflect a more consistent behavioural logic on China's part in regional hydropolitics, as already evidenced on the Mekong basin in relation to Southeast Asian downstream states.

Data sources and selection criteria. Data were collected and analysed from three complementary groups of sources. The first group comprises policy documents and technical reports from authoritative international organisations, including the International Energy Agency (IEA), UN-Water, and CNA Analysis and Solutions, etc. These materials provide an objective data foundation regarding water resources, energy, and relevant development indicators. The second group consists of peer-reviewed academic literature, encompassing studies on hydropolitics, Sino-Indian relations, and balancing theory in international relations. Priority was given to works published in

academic journals indexed in Scopus and Web of Science within the past two decades, so as to ensure contemporaneity and scholarly credibility. The third group comprises secondary materials, including credible media reports from outlets such as *The Hindu*, *South China Morning Post*, and *Business Standard*, as well as official policy statements from the governments of India and China. This group of sources is used primarily to update recent policy developments and to illustrate theoretical arguments with empirical evidence, with explicit acknowledgement of their comparatively limited reliability relative to peer-reviewed academic literature.

Analytical procedure. The analysis proceeds in three logically sequential steps. Step one involves the construction and consolidation of the theoretical framework based on negative balancing, with a view to decoding the strategic logic underpinning China's hydropower policy. This step entails a systematic review of theoretical literature on realism and balance of power – particularly He's (2012) work on negative balancing – in order to develop an analytical framework applicable to the Brahmaputra context. Step two involves the application of this theoretical framework to specific dam projects on the Brahmaputra, examining empirical evidence regarding ecological, livelihood, and geopolitical impacts through systematic documentary analysis. At this stage, the paper poses critical questions: Is the evidence consistent with the predictions of negative balancing theory? Are there more plausible alternative explanations? Step three involves connecting the findings to the relevant Sustainable Development Goals (SDGs) and thereby proposing policy pathways toward substantive green diplomacy.

Limitations of the study. Several limitations warrant acknowledgement. First, ascertaining China's "strategic intent" is inherently difficult to verify directly from the outside; the paper therefore primarily infers from observed behavioural patterns rather than from official policy declarations. Second, downstream impacts are often difficult to attribute with certainty to specific upstream activities, given that river systems are simultaneously subject to multiple influencing factors. Third, official hydrological data from China is limited in transparency – a constraint that is simultaneously a limitation of the study and, as the paper argues, indirect evidence of the negative balancing strategy itself. Awareness of these limitations enables the paper to maintain scholarly integrity while still advancing analytically valuable arguments.

Table 1. A realism analytical framework applied to Sino-Indian relations

Dimension	Realism assumption	Application to Sino-Indian relations
System structure	international politics is anarchic; states rely on self-help (Jütersonke, 2010)	India and China act independently to secure water and energy resources in the absence of institutional guarantees
Power strategy	states maximise power to secure national interests; cooperation is constrained	China employs dam projects to enhance energy security and geopolitical leverage
Balancing mechanism	negative balancing: undermining a rival's capabilities rather than augmenting one's own (He, 2012)	China's upstream control reduces India's capacity to exploit the resource potential of the Brahmaputra
Resource politics	natural resources are simultaneously developmental and security assets	water becomes a strategic instrument, linking environment, livelihoods, and geopolitics
Consequences	realism competition generates ecological, social, and geopolitical consequences	India faces ecological risks, livelihood insecurity in the Northeast, and regional instability

Source: own elaboration.

RESULTS AND DISCUSSION

CHINA'S GREEN RISE THROUGH DAM PROJECTS ON THE BRAHMAPUTRA RIVER

China's upstream interventions on the Brahmaputra River are not isolated development projects; they are embedded within a broader strategic vision commonly described as a "green rise." This concept captures the ambitions of a rising power to position itself not merely as a producer but as a global provider of renewable energy, thereby securing long-term energy resilience in an era of climatic disruption. Within this strategic framework, China's relentless dam-building can be read as a deliberate roadmap aimed at consolidating a green narrative while simultaneously enhancing geopolitical leverage over neighbouring states. The characterisation of China as "the world's most prolific dam-builder" underscores the scale and intensity of its hydropower agenda, while water itself is increasingly being reframed as a critical security variable in the 21st century (Christopher, 2013). In order to decode the connections between China's green rise and its geopolitical implications for India, this study applies the theoretical lens of negative balancing. From this perspective, dam construction on the upper Brahmaputra is not merely about energy production; it is equally about the strategic curtailment of India's capacity to exploit its own resources. Water, traditionally considered a developmental asset, has been transformed into a contested domain where ecological sustainability, livelihood security, and geopolitical competition intersect. The Brahmaputra illustrates how hydropolitical ambitions can elevate a shared river into a site of strategic contestation, with China's green rise achieved in part through the erosion of India's resource potential.

China has pursued an ambitious portfolio of hydropower projects on the Brahmaputra – known in Tibet as the Yarlung Tsangpo – aimed at harnessing the river's immense hydroelectric potential. These projects form part of Beijing's broader energy strategy and have generated considerable concern in India regarding their downstream consequences. Among the most notable is the Zam Hydropower Station, a project valued at approximately USD1.5 bn (Manhas and Yadav, 2024). Situated at a high altitude, it is recognised as the largest hydropower facility in Tibet and is designed to generate approximately 2.5 GWh of electricity annually. India has expressed concern that large-scale operations of this nature could disrupt river flows and affect its own projects in Arunachal Pradesh, including the Upper Siang and Lower Subansiri schemes. Another significant structure is the Zangmu Dam, located on the main channel of the Brahmaputra in Gyaca County, approximately 161 km from Lhasa. With an installed capacity of 510 MW, this dam increased Tibet's power generation capacity by nearly one quarter upon its commissioning in 2015. Its location, approximately 435 km from the Indian border, underscores its strategic significance within the regional energy landscape (Ranjan, 2020).

China has also carried out projects on the Brahmaputra's tributaries. The Lalho Dam involves the diversion of a tributary's flow, raising water security concerns among downstream states. The Jiacha Dam, under construction in Shannan Prefecture, is expected to generate approximately 320 MW upon completion, further consolidating China's hydropower presence in the river's middle reaches (Ranjan, 2020). Crucially, these projects are not isolated developments but constitute components of a deliberately

planned long-term policy framework. In 2013, the Chinese State Council incorporated three hydropower projects – Dagu, Jiacha, and Jixu – into the 12th Five-Year Plan (2011–2015), signalling a sustained commitment to expanding hydroelectric capacity on the Yarlung Tsangpo (Ranjan, 2020). Their institutionalisation within national planning documents constitutes significant evidence that these projects are not merely reactive responses to domestic electricity demand, but components of a long-term development strategy informed by geopolitical calculation.

China's domestic development strategy has long relied on large-scale water diversion schemes. The most prominent among these is the South–North Water Diversion Project (SNWD), launched in 2002. Designed with three routes – eastern, central, and western – this project aims to redirect water from the Yangtze River in the south to the Yellow River basin in the north, supplying major urban centres including Beijing and Tianjin (Samaranayake, Limaye, and Wuthnow, 2016). Although the eastern and central routes have been completed, proposals have periodically surfaced to extend the diversion plans to encompass the Brahmaputra. While such plans have not yet materialised, the debate persists that worsening water scarcity in northern China may ultimately render Brahmaputra diversion necessary (Samaranayake, Limaye, and Wuthnow, 2016). Beyond the SNWD, China has envisioned the Grand Western Water Diversion Project (GWWD), which would channel water from six major rivers in southwestern China – including the Mekong, Brahmaputra, and Salween – northward toward arid regions. This ambitious scheme would rely on reservoirs, tunnels, and natural river systems to facilitate transfer (Zhang, 2016). India views such proposals with profound alarm, fearing that the diversion of Brahmaputra waters could devastate the Northeast, stripping the region of its ecological vitality and livelihood base.

Beyond the hydropower dams themselves, India's greatest concern lies with China's potential diversion at the Great Bend of the Yarlung Tsangpo – an abrupt southward curve near Arunachal Pradesh. A large-scale facility has been proposed in the Medog area (Watts, 2010), and analysts warn that such a project could ultimately drain the Brahmaputra downstream, threatening the survival of tens of millions of people (BBC, 2014; Zhang, 2016). Scholars argue that deepening water scarcity, compounded by climate change and desertification, could compel Chinese authorities to proceed with large-scale diversion plans should the SNWD fail to meet expectations. These risks escalated significantly in December 2024, when China approved a mega hydropower dam at the Great Bend in Medog County, Tibet – a location of particular historical gravity as the epicentre of the catastrophic 1950 earthquake. The dam has been described as a "ticking water bomb" due to its potential to endanger downstream communities in both India and Bangladesh (Rahman, 2025; Singh, 2025). This approval is not merely a technical decision; it carries profound strategic implications and raises fundamental questions about the true character of China's hydropower policy in the context of intensifying border tensions.

Water, therefore, is not simply a developmental resource but also a geopolitical instrument. In the context of Sino–Indian relations, even minor disputes can escalate into major confrontations under adversarial conditions. The Brahmaputra ranks poorly in terms of basin management capacity, owing to fragmented development planning, the absence of water-sharing agreements, and vulnerability to saline intrusion in the deltaic

region. The absence of a basin-level treaty – notwithstanding the Brahmaputra's status as the world's fifth-largest river by discharge – leaves it outside any rules-based regional governance framework, thereby permitting unilateral and frequently unscientific management (Samaranayake, Limaye, and Wuthnow, 2016).

The Brahmaputra extends approximately 2,900 km, originating from the Angsi Glacier in the Kailash Range of Tibet before flowing through Northeast India and into Bangladesh, where it joins the Ganges near the Sundarbans delta before discharging into the Bay of Bengal. The river's steep Himalayan gradient affords China a pronounced natural advantage in hydropower production, with an average slope of $2.82 \text{ m}\cdot\text{km}^{-1}$ that diminishes to merely $0.1 \text{ m}\cdot\text{km}^{-1}$ across the Assam valley. This abrupt change in gradient produces a braided channel configuration, as the river is augmented by numerous tributaries – approximately 20 from the northern bank and 13 from the southern – transporting vast volumes of sediment. The river's enormous discharge, approaching $170,000 \text{ m}^3\cdot\text{s}^{-1}$ when confluent with the Ganges, underscores its ecological and economic significance (Coleman, 1969). The Brahmaputra's drainage basin covers approximately $194,413 \text{ km}^2$ in India, accounting for 5.9 per cent of the country's land area, and extends across Tibet, Bhutan, India, and Bangladesh, spanning nearly $580,000 \text{ km}^2$.

River disputes are not novel in international politics, but their significance is growing in the context of climate change. China's hydropolitical dominance has been clearly demonstrated in Southeast Asia, where large-scale upstream projects on the Mekong have generated persistent tensions with downstream states, including Laos, Cambodia, Vietnam, and Thailand. This behavioural pattern suggests that what is being observed in Sino-Indian relations is not an isolated phenomenon but reflects a more systematic strategy on Beijing's part of leveraging upstream position as a strategic instrument. In this context, the Brahmaputra represents a paradigmatic case in hydropolitics, linking environmental sustainability, livelihood security, and geopolitical competition – particularly within the tripartite relationship among China, India, and Bangladesh.

ECOLOGICAL, LIVELIHOOD, AND WATER SECURITY CONSEQUENCES

For the northeastern states of India, the Brahmaputra is indispensable, sustaining irrigation, drinking water, inland waterways, and hydroelectric generation (Manhas and Yadav, 2024). Yet China's upstream activities threaten to destabilise this region socioeconomically in ways that are profound and potentially irreversible. Recurring floods and water scarcity have compelled communities to abandon traditional livelihoods, driving migration and deepening poverty. Farmers and fisherfolk – those most dependent on the river – are frequently displaced to marginal lands, where they risk being labelled “encroachers” (Baruah, 2014; Mahapatra and Ratha, 2016). India's concern is that China's calculated manipulation – restricting flow during summer and discharging excess water during the monsoon season – could simultaneously generate both drought and flooding (Mahapatra and Ratha, 2016; Xie, Zhang and Panda, 2018). This concern is not without empirical basis: cases such as the sudden discolouration of the Siang River – widely linked by analysts to large-scale construction activities upstream – demonstrate China's practical

capacity to alter water quality and quantity without prior notification. This constitutes the most alarming dimension of negative balancing: the impact need not be declared or acknowledged to inflict real and serious harm.

These impacts bear direct relevance to Sustainable Development Goal (SDG) 1 (no poverty) and SDG 2 (zero hunger). Flow manipulation – whether through flood control or dry-season discharge regulation – directly affects downstream agriculture and rural livelihoods, pushing vulnerable communities into cycles of poverty and food insecurity. Given that more than 85 per cent of cultivated area in Northeast India is devoted to wetland rice cultivation (Dikshit and Dikshit, 2014), any disruption to flow regimes could produce catastrophic consequences for local food security and agricultural income, with cascading effects on social welfare across the region.

Beyond material impacts, the cultural consequences of upstream hydropower projects are no less serious and cause for profound concern. Rivers carry deep spiritual significance and embody traditional ecological knowledge for riparian communities (Mahla, 2024). Mega-dams disrupt these cultural landscapes, severing communities from their ancestral relationship with the river and eroding indigenous knowledge systems cultivated across generations. The combined loss of livelihoods, ecological degradation, and water scarcity inflicts irreparable damage upon cultural heritage – a dimension frequently overlooked in hydropolitical analyses that foreground economic and strategic metrics.

Economically, these consequences are existential in the most literal sense. Water scarcity undermines food security and foundational livelihoods, transforming ecological challenges into direct threats to communities' survival. This connects directly to SDG 6 (Clean Water and Sanitation): transboundary asymmetries in water control diminish downstream communities' access to safe and reliable water in both India and Bangladesh. Bangladeshi scientists have raised concerns over sediment deposition attributable to upstream interventions (Wuthnow, Limaye and Samaranayake, 2020) – an issue that affects not only water quality but also has long-term implications for the deltaic ecosystem and agricultural productive capacity of the lowest downstream riparian state.

To appreciate the asymmetric nature of this contestation more fully, a comparative examination of water resource data between the two states is warranted. China and India exhibit significant disparities in renewable water resources: China's external water flows are estimated at $17,169 \text{ mln m}^3$, while India's stand at $647,220 \text{ mln m}^3$ (UNFAO, 2011). However, when total water availability is considered, China's external water dependency ratio stands at only 9%, compared to India's 33% (UNFAO, 2011). This contrast highlights the structurally asymmetric nature of water security between the two states: India's greater dependence on external inflows renders it more vulnerable, while China's relative water independence reinforces its position as a hydro-hegemon and amplifies Beijing's strategic leverage.

In bilateral terms, India and China do not compete on an equal footing. Security in this context extends beyond military power to encompass human security, in which resource access directly determines livelihood outcomes. Border tensions amplify this dynamic: the Himalayan frontier zone is a sensitive area where China's expansionary projects appear feasible, yet India's

infrastructure investments drain resources required for internal development. China continues to press claims over approximately 90,000 km² of territory in Northeast India, including Arunachal Pradesh (Goswami, 2012). Recent actions – the renaming of locations in Arunachal (Haidar and Peri, 2023), the publication of maps incorporating Arunachal and Aksai Chin (Krishnan, 2023), and the creation of new counties in Aksai Chin (Bhaumik, 2024) – illustrate an increasingly assertive cartographic warfare strategy. River projects situated near the border further complicate questions of sovereignty, as natural resources themselves become markers of territorial identity.

Water scarcity exerts a direct and profound impact on food security. Agriculture remains the backbone of the Indian economy, heavily dependent on seasonal rainfall and irrigation. Northeast India falls within the Southeast Asian rice belt, with rice accounting for nearly 85% of cultivated area (Dikshit and Dikshit, 2014). Crops such as pulses, maize, tea, and horticulture supplement this agricultural base, with Assam globally recognised for its tea production. The Brahmaputra's flow is therefore indispensable for sustaining the agriculture and livelihoods of tens of millions of people in the region. Chinese dams on the river – while beneficial for Beijing's own power grid and domestic water supply – risk seriously destabilising India's agricultural sector. Specifically, reservoirs trap nutrient-rich sediment, reducing soil fertility and diminishing crop productivity in downstream areas. This represents one of the most consequential mechanisms through which negative balancing operates in practice: not through military action or direct confrontation, but through the gradual and silent degradation of the very resource base upon which a state depends for survival and development. These consequences extend beyond agriculture: industrial activity is affected as water becomes scarce, generating financial instability; public health is threatened as contaminated water supplies contribute to increased waterborne disease. China's hydropolitics on the Brahmaputra thus not only reinforces China's green rise through renewable energy, but simultaneously destabilises Northeast India through the mechanism of negative balancing, undermining food security, livelihoods, and national resilience simultaneously.

ENVIRONMENTAL SECURITY AND THE VULNERABILITY OF THE HIMALAYAS

Population growth and escalating pressure on natural resources have elevated environmental security to an urgent issue that transcends national boundaries. Human activities have intensified ecological stress, while climate change has amplified risks such as glacial lake outburst floods, threatening downstream communities (Vasudeva, 2024). Even southern China faces ecological vulnerability in this power struggle. Although China's transition to renewable energy may enhance its carbon security, the ecological consequences for Northeast India may be severe and long-lasting.

This dimension connects directly to SDG 13 (Climate Action): large-scale dam projects in the Himalayas exert significant influence over flow regimes and climate adaptation capacities. Although presented as renewable energy, they interfere with hydrological systems that serve as natural buffers against flash flooding and drought – events that are growing increasingly frequent in a changing climate. This generates a profound and troubling climate paradox: one state's climate action becomes

another state's climate threat, exposing serious inadequacies in existing international climate governance frameworks.

The Northeast is not merely a strategic frontier but also an ecologically significant conservation area of global importance. Arunachal Pradesh, with its dense evergreen forests, is home to endemic flora and fauna across diverse climatic ecological zones (Roy *et al.*, 2015). The Eastern Himalayas, encompassing United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Sites such as Kaziranga National Park and Manas Wildlife Sanctuary, underscore the exceptional biodiversity significance of the region. Rivers are central to this ecosystem, and the damming or scientifically unjustified diversion of water threatens to disrupt its delicate equilibrium.

Flooding further compounds these challenges. Assam – traversed by the Brahmaputra and Barak rivers and their tributaries – experiences recurring floods and erosion that severely impede development. Approximately 39.58% of Assam's land area is flood-prone, far exceeding the national average, with annual flood management costs reaching 2 bn rupees (about USD21 mln; USD1 = INR95 in 2026). China's upstream projects risk exacerbating these disasters, intensifying erosion and compelling further community displacement. The Siang Valley has experienced multiple flash floods attributable to dam failures across the border (Jai, 2024). While these incidents do not constitute direct evidence of deliberate intent, they clearly highlight the structural risks generated by opacity in upstream dam management – and this is precisely the type of risk that a formal water governance treaty could substantially mitigate.

The ecological consequences of large-scale dam construction in the Himalayas are enormous in scope and impact. This region now holds the highest density of dams in the world. By 2020, China had constructed more than 87,000 small dams (Manhas, 2023). Alarming, many of these structures are located in areas of significant seismic activity, increasing the risk of catastrophic failure that could inundate Assam and Arunachal Pradesh, endangering forests, wetlands, and vulnerable ecosystems (Mahapatra and Ratha, 2016). Historical precedents underscore these dangers: seismic activity near the Three Gorges Reservoir has been linked to an increased frequency of earthquakes (Xiao, 2021), while the 2008 Wenchuan earthquake – attributed in part to the Zipingpu Dam – claimed nearly 80,000 lives.

Beyond seismic threats, dam infrastructure disrupts aquatic biodiversity in ways that are irreversible. Dams obstruct fish migration, contributing to the decline and even extinction of species (Mahla, 2024). Water pollution has further depleted aquatic populations. The extinction of the Yangtze River dolphin following the construction of the Three Gorges Dam stands as a poignant testament to the irreversible ecological damage caused by large-scale anthropogenic interventions (Mahla, 2024). These lessons are not merely historical; they constitute practical warnings for any policy decision involving large-scale hydro-power projects on transboundary rivers of high biodiversity value. For India, these developments erode internal capacity as resources must be redirected toward disaster management. Investments in economic development risk being neutralised by ecological instability, while agriculture and drinking water supplies suffer harm. Ultimately, upstream activities on the Brahmaputra and the resultant flooding in the Northeast undermine India's overall resilience, destabilising both the ecological and developmental foundations of the country.

THE GEOPOLITICAL DIMENSIONS OF BORDER CONFLICTS AND WATER

Water, as a transboundary resource, frequently serves simultaneously as a bridge for cooperation and a trigger for conflict. In the case of India and China, the Brahmaputra basin has become a central flashpoint owing to persistent rivalry and competing strategic interests. Positioned upstream, China employs countervailing strategies – most notably negative balancing – to undermine India's access to critical water resources. By restricting India's share of water, Beijing weakens both human and national security, maintaining India in a position of structural vulnerability. It is noteworthy that while China employs positive balancing in its border policies – through military force enhancement and infrastructure construction along the frontier – it relies upon negative balancing in water politics: a subtler approach that more effectively conceals intent and is less likely to provoke direct international reactions than overt military action. This dual strategy, combined with deep-seated mistrust and unresolved geopolitical differences, transforms water into a central agent of long-term bilateral tension.

This connects directly to SDG 16 (Peace, Justice and Strong Institutions): poorly governed water disputes not only generate diplomatic tensions but carry the potential for escalation into armed conflict, particularly in the context of unresolved territorial disputes along the Himalayan border. The absence of transparent and inclusive regional water governance institutions means that disputes continue to be resolved through power and pressure rather than through legal processes or principled dialogue.

China's manipulation of water resources carries geopolitical implications that extend beyond bilateral relations. Unresolved borders impede the effective management of shared rivers, and competing claims over the basin illustrate the deep entanglement between territorial disputes and water politics (Mahla, 2024). Beijing's ambiguous posture – asserting that the dams pose no threat while simultaneously evading multilateral dialogue and concealing infrastructure projects – reinforces a deliberate strategic opacity. Large-scale dam construction on the Brahmaputra exemplifies this unilateral approach (Biba, 2014), providing China with tangible leverage over India and perpetuating unresolved tensions.

Historical precedents illuminate how water and borders intersect differently in conditions of peace and conflict. Cooperative frameworks such as the 2013 Memorandum of Understanding on transboundary rivers and the Border Defence Cooperation Agreement (Feng, Wang and Liu, 2019) stand in sharp contrast to China's withholding of hydrological data during the 1962 war and the 2017 Doklam standoff – actions that exacerbated flooding in Assam and Uttar Pradesh (Purohit, 2023). While Beijing attributed the suspension of data-sharing to technical issues, Indian analysts regard it as a deliberate strategic calculation. Such actions deepen mistrust, leading India to question the accuracy and reliability of shared data, thereby directly weakening its flood forecasting and disaster management capacities. As Chellaney (2014) has observed, even the withholding of hydrological data can constitute an act of deploying water as a political weapon.

Bangladesh is an actor that cannot be overlooked in this geopolitical analysis. As the lowest downstream riparian on the entire river system, Bangladesh directly bears the consequences of

upstream activities – regardless of whether they originate from China or India. When Chinese upstream activities reduce the quality or quantity of water reaching India, the impact cascades further downstream into Bangladesh. Rising sea levels and climate change compound Bangladesh's vulnerability, while domestic political instability – illustrated by the resignation of Prime Minister Sheikh Hasina – further complicates the country's policy responses. Furthermore, India's own dam projects – such as the Tipaimukh Dam in the Barak Valley – have strained relations with Bangladesh, adding another layer of complexity to the regional geopolitical picture. This situation reflects an important reality: in transboundary river systems, no state is exclusively victim or exclusively perpetrator – all are simultaneously both, depending on their position within the basin.

This renders SDG 17 (Partnerships for the Goals) particularly urgent: cooperative water governance cannot be confined to the bilateral Sino-Indian dyad but must be extended to incorporate Bangladesh and Bhutan within a more comprehensive regional framework. The approval of the mega-dam at the Medog Great Bend in late 2024 further intensifies this competition, threatening all three downstream states. These projects propel narratives of "water wars," raising the spectre of militarised conflict. Downstream states regard such mega-dams as "water bombs" with catastrophic potential (Rahman, 2025). In essence, China's infrastructural dominance as the upstream state amplifies the vulnerability of both India and Bangladesh, threatening their security and sovereignty in ways that cannot be adequately addressed through military or conventional diplomatic measures alone.

GREEN DIPLOMACY AND THE SUSTAINABLE DEVELOPMENT GOALS

Although India and China have concluded Memoranda of Understanding on hydrological data-sharing for rivers including the Brahmaputra and Sutlej, as well as dialogue mechanisms at the expert level, the absence of a formal water treaty remains the most critical obstacle to trust-building. The Brahmaputra is the world's fifth-largest river by discharge, yet it lacks any rules-based regional governance framework – a condition that permits unilateral and frequently unscientific management (Samaranayake, Limaye, and Wuthnow, 2016). This absence is not accidental; it reflects China's deliberate strategic choice to preserve flexibility in its water policy, avoiding constraints imposed by international legal obligations that might limit future projects.

The Brahmaputra water crisis is not merely a bilateral issue – it is a paradigmatic case of global governance failure touching upon several of the United Nations' most fundamental SDGs (see Tab. 2).

The foregoing analysis indicates that substantive green diplomacy in the Sino-Indian context cannot be confined to joint environmental declarations or technical data exchange. It requires a multi-tiered approach integrating strategic, legal, and technical elements. At the institutional tier, the most urgent step is the negotiation of a legally binding water treaty for the Brahmaputra basin – ideally a multilateral instrument encompassing India, China, and Bangladesh. The model of the Mekong River Commission (MRC), while imperfect, provides a valuable reference point for multilateral monitoring mechanisms. Such

Table 2. Linkages between Brahmaputra hydropolitics and the United Nations Sustainable Development Goals (SDGs)

SDG	Goal title	Impact of China's upstream projects	Consequences for India and the region
SDG 1, 2	No Poverty, Zero Hunger	altered sediment regimes, monsoon flooding, and reduced dry-season flows destabilise downstream agriculture and rural livelihoods	vulnerable communities in Northeast India – where agriculture sustains tens of millions – risk being pushed deeper into poverty and food insecurity
SDG 6	Clean Water and Sanitation	transboundary asymmetries in water control restrict safe water access for downstream communities; sediment deposition and upstream construction pollution degrade water quality	an SDG concern becomes a genuine public health threat with immediate consequences for communities in India and Bangladesh
SDG 13	Climate Action	hydropower dams built in the name of green energy disrupt natural climate-adaptive ecosystems and interfere with hydrological regimes critical to downstream communities' climate adaptation	a profound climate paradox is created: one state's climate action becomes another state's climate threat, exposing inadequacies in existing international climate governance mechanisms
SDG 16	Peace, Justice and Strong Institutions	absence of transparent and inclusive regional water governance institutions; no multilateral water treaty for the Brahmaputra basin	poorly managed water disputes carry escalation potential into armed conflict; disputes continue to be resolved through power and pressure rather than legal process and negotiation
SDG 17	Partnerships for the Goals	sustainable water governance requires cooperative mechanisms extending beyond the Sino–Indian bilateral relationship to include Bangladesh, Bhutan, and international organisations such as United Nations Environment Programme (UNEP) and Economic and Social Commission for Asia and the Pacific (ESCAP)	this is the most constructive SDG in this context: multilateral partnerships are an indispensable condition for resolving the Brahmaputra water crisis sustainably and equitably

Source: own elaboration.

a treaty would need to incorporate provisions for real-time hydrological data-sharing, prior consultation obligations for large-scale infrastructure projects, and a binding dispute resolution mechanism. At the technical tier, cooperation in transboundary environmental impact assessment and water management technology sharing should be promoted – not merely to mitigate risk but to generate genuine mutually beneficial opportunities, particularly in the areas of flood management and disaster prevention. At the strategic tier, India needs to strengthen investment in its own water storage and utilisation projects – not to escalate competition, but to reduce structural dependence on unregulated flows from China. Simultaneously, India needs to pursue a proactive water diplomacy strategy within multilateral forums, in order to internationalise the issue and generate institutional pressure on China to comply with international water governance standards.

CONCLUSIONS

Dams and associated infrastructure have become instruments of geopolitical manipulation, enabling China to apply negative balancing against India by eroding the latter's resource capabilities. This strategy directly impacts livelihoods in the Northeast, simultaneously undermining national security, environmental integrity, and food security. The interplay between transboundary water and border disputes reinforces a cycle of mistrust, in which unresolved boundaries impede cooperative river management, equitable resource-sharing, and sustainable development. The paper's central research question – whether China's hydropower projects reflect a deliberate negative balancing strategy aimed at eroding

India's internal capabilities – may be answered in the affirmative, albeit with important qualifications that must be acknowledged. Empirical evidence, ranging from the scale and strategic location of dams to the withholding of hydrological data during periods of heightened tension, reveals a behavioural pattern consistent with the logic of negative balancing. This conclusion does not, however, preclude the possibility that these projects are also driven by genuine domestic development needs and authentic renewable energy objectives. Ambiguity of intent is a defining characteristic of negative balancing as a strategy – and it is precisely this ambiguity that renders it effective and difficult to counter.

China's water infrastructure policy began to assume prominence after 2010 and became more pronounced after 2015, coinciding with escalating border tensions. India's response has been largely characterised by “underbalancing,” with bilateral negotiations constrained by ongoing conflicts. The consequences extend beyond India's internal vulnerabilities to encompass regional dynamics: Bangladesh, as the lowest downstream riparian, confronts growing insecurity as China's upstream activities coincide with the country's own domestic political instability. China's green rise is thus achieved at the expense of India's resource capabilities and border security, generating asymmetric advantages that disadvantage India across multiple fronts simultaneously.

This study underscores the interconnected nature of water scarcity, ecological degradation, and geopolitical competition. Beyond the bilateral Sino–Indian relationship, it highlights a broader tension between development and environmental sustainability – a debate that transcends national boundaries and cannot be resolved within the framework of purely statist thinking. The Brahmaputra basin illustrates how ecological

catastrophe can emerge alongside direct geopolitical confrontation, reinforcing the urgency of climate diplomacy at both the bilateral and regional levels. Such diplomacy must address traditional security concerns while simultaneously integrating non-traditional threats related to the environment, livelihoods, and climate change.

This crisis also highlights the profound and urgent relevance of the SDGs for practical governance. The SDG 6 on clean water for all cannot be achieved without addressing transboundary power asymmetries. The SDG 13 on climate action cannot be implemented if one state's "green energy" becomes another's ecological catastrophe. And SDG 16 on peace and strong institutions cannot be realised if transboundary rivers remain spaces beyond the reach of international legal frameworks. The most pragmatic hope – though not a guaranteed one – lies in SDG 17: partnership. Yet the strategic calculus remains clear: the benefits China derives from negatively balancing India outweigh the costs of pursuing cooperative arrangements. As long as border disputes and geopolitical ambitions persist, resource neutralisation will continue to serve as Beijing's preferred tactic.

Although India and China have concluded Memoranda of Understanding on hydrological data-sharing for rivers, including the Brahmaputra and Sutlej, as well as expert-level dialogue mechanisms, the absence of a formal water treaty remains a critical impediment to trust-building. Given their enormous populations and intensifying water scarcity challenges, both countries must work toward a comprehensive bilateral framework that prioritises environmental protection, joint resource management, and technological cooperation to improve water use efficiency. Altering the current strategic calculus – through a combination of international pressure, improved bilateral engagement, and India's internal capacity-building – constitutes the central policy challenge that scholars, policymakers, and diplomats must urgently address in the decades ahead.

CONFLICT OF INTERESTS

All authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

All data supporting the findings of this study are publicly available and can be accessed through the sources cited in the reference list.

REFERENCES

- Baruah, S. (2014) "Upstream superpowers," *The Indian Express*, 5 December. Available at: <https://indianexpress.com/article/opinion/columns/upstream-superpowers/> (Accessed: March 2, 2026).
- BBC (2014) *Megadams: Battle on the Brahmaputra*, 20 March. Available at: <https://www.bbc.com/news/world-asia-india-26663820> (Accessed: March 2, 2026).
- Bhaumik, A. (2024) "China makes another move to assert territorial claim, creates new county with large parts of India's Aksai Chin," *Deccan Herald*, 28 December. Available at: <https://www.deccanherald.com/india/china-makes-another-move-to-assert-territorial-claim-creates-new-county-with-large-parts-of-indias-aksai-chin-3335098> (Accessed: March 2, 2026).
- Biba, S. (2014) "Desecuritization in China's behavior towards its transboundary rivers: The Mekong River, the Brahmaputra River, and the Irtysh and Ili Rivers," *Journal of Contemporary China*, 23(85), pp. 21–43. Available at: <https://doi.org/10.1080/10670564.2013.809975>.
- Chellaney, B. (2014) *Water, peace and war: Confronting the global water crisis*. Oxford: Oxford University Press.
- Christopher, M. (2013) *Water wars: The Brahmaputra River and Sino-Indian relations*. Newport RI: United States Naval War College, Center on Irregular Warfare and Armed Groups. Available at: <https://digital-commons.usnwc.edu/ciwag-case-studies/7> (Accessed: March 2, 2026).
- Coleman, J.M. (1969) "Brahmaputra River: Channel processes and sedimentation," *Sedimentary Geology*, 3(2–3), pp. 129–239. Available at: [https://doi.org/10.1016/0037-0738\(69\)90010-4](https://doi.org/10.1016/0037-0738(69)90010-4).
- Das, A. (2025) "How will China building a dam in Brahmaputra impact India?," *Vygr News*, 4 January. Available at: <https://vygrnews.com/india-news/chinadamissue> (Accessed: March 2, 2026).
- Dikshit, K.R. and Dikshit, J.K. (2014) "Agriculture in North-East India: Past and present," in *North-East India: Land, people and economy. Advances in Asian human-environmental research*. Dordrecht: Springer. Available at: https://doi.org/10.1007/978-94-007-7055-3_16.
- Feng, Y., Wang, W. and Liu, J. (2019) "Dilemmas in and pathways to transboundary water cooperation between China and India on the Yaluzangbu-Brahmaputra River," *Water*, 11(10), 2096. Available at: <https://doi.org/10.3390/w1102096>.
- Goswami, N. (2012) *China's territorial claim on India's eastern sector: Tibet as core*. IDSA Issue Brief. New Delhi: Manohar Parrikar Institute For Defence Studies and Analyses. Available at: <https://idsa.in/publisher/issuebrief/chinas-territorial-claim-on-indias-eastern-sector-tibet-as-core> (Accessed: March 2, 2026).
- Haidar, S. and Peri, D. (2023) "China announces 'renaming' of 11 places in Arunachal Pradesh," *The Hindu*, 3 April. Available at: <https://www.thehindu.com/news/national/china-releases-third-set-of-chinese-names-to-assert-its-claim-over-arunachal-pradesh/article66695225.ece> (Accessed: March 2, 2026).
- He, K. (2012) "Undermining adversaries: Unipolarity, threat perception, and negative balancing strategies after the Cold War," *Security Studies*, 21(2), pp. 154–191. Available at: <https://doi.org/10.1080/09636412.2012.679201>.
- Heffron, D. (2015) *What do realisms think about climate change?* London: Centre for Geopolitics & Security in Realism Studies. Available at: <https://cgsrs.org/publications/30> (Accessed: March 2, 2026).
- Hukil, R. (2013) "India, China, and the Brahmaputra: Understanding the hydro-politics," *Institute of Peace and Conflict Studies*, 9 May, 3925. Available at: https://www.ipcs.org/comm_select.php?articleNo=3925 (Accessed: March 2, 2026).
- IEA (2021) "Hydropower has a crucial role in accelerating clean energy transitions to achieve countries' climate ambitions securely," *International Energy Agency*, 30 June. Available at: <https://www.iea.org/news/hydropower-has-a-crucial-role-in-accelerating-clean-energy-transitions-to-achieve-countries-climate-ambitions-securely> (Accessed: March 2, 2026).
- Jütersonke, O. (2010) "Hans J. Morgenthau in international relations," in *Morgenthau, Law and Realism*. Cambridge: Cambridge University Press, pp. 1–36.
- Jai, S. (2024) "Arunachal's Siang Valley dam project on fast track to counter China threat," *Business Standard*, 21 October. Available at: <https://www.business-standard.com/economy/news/aruna->

- chal-s-siang-valley-dam-project-on-fast-track-to-counter-china-threat-124102000508_1.html (Accessed: March 2, 2026).
- Krishnan, A. (2023) "China releases new official map, showing territorial claims," *The Hindu*, 28 August. Available at: <https://www.thehindu.com/news/international/china-releases-new-official-map-showing-territorial-claims/article67245869.ece> (Accessed: March 2, 2026).
- Kiet, L.H., Binh, N.T. and Hiep, T.X. (2025) "From border conflicts to maritime competition: Driving forces behind the power rivalry between India and China in the Indian Ocean region," *Australian Journal of Maritime & Ocean Affairs*, pp. 1–25. Available at: <https://doi.org/10.1080/18366503.2025.2492438>.
- Mahapatra, S.K. and Ratha, K.C. (2016) "Brahmaputra River: A bone of contention between India and China," *Water Utility Journal*, 13, pp. 91–99. Available at: https://www.ewra.net/wuj/pdf/WUJ_2016_13_08.pdf (Accessed: March 2, 2026).
- Mahla, P.K. (2024) "Navigating borders and waters: India-China border disputes and the complexities of transboundary river management," *OASIS*, 40, pp. 211–230. Available at: <https://doi.org/10.18601/16577558.n40.10>.
- Manhas, N.S. (2023) "A fragile lifeline: India and China must collaborate on water," *The Interpreter*, 21 November. Available at: <https://www.lowyinstitute.org/the-interpreter/fragile-lifeline-india-china-must-collaborate-water> (Accessed: March 2, 2026).
- Manhas, N.S. and Yadav, G.H. (2024) 'Beyond the border: Exploring the complex dynamics of water tensions between India and China,' *Discover Global Society*, 2, 57. Available at: <https://doi.org/10.1007/s44282-024-00089-x>.
- Purohit, K. (2023) "China-India border dispute spills over into water resources: 'Difficult to agree,'" *South China Morning Post*, 4 September. Available at: <https://www.scmp.com/week-asia/politics/article/3233141/china-india-border-dispute-spills-over-water-resources-difficult-agree> (Accessed: March 2, 2026).
- Rahman, M.Z. (2025) "Implications of China's mega-dam project | Explained," *The Hindu*, 6 January. Available at: <https://www.thehindu.com/news/international/the-implications-of-chinas-mega-dam-project-explained/article69064553.ece> (Accessed: March 2, 2026).
- Ranjan, A. (2020) "China's hydropower projects on River Brahmaputra," *ISAS Brief*, 801. Available at: <https://www.isas.nus.edu.sg/papers/chinas-hydropower-projects-on-river-brahmaputra/> (Accessed: March 2, 2026).
- Roy, A. et al. (2015) "Biodiversity in North East India and their conservation," *Journal of Progressive Agriculture*, 6(2), pp. 64–69. Available at: <https://indianjournals.com/article/jpa-6-2-015> (Accessed: March 2, 2026).
- Singh, A. (2025) "China's new Brahmaputra dam: Fresh worries for India amidst rapprochement," *Council for Strategic and Defense Research*, 8 January. Available at: <https://csdronline.com/blind-spot/chinas-new-brahmaputra-dam-fresh-worries-for-india-amidst-rapprochement/> (Accessed: March 2, 2026).
- Samaranayake, N., Limaye, S. and Wuthnow, J. (2016) *Water resource competition in the Brahmaputra River Basin: China, India, and Bangladesh*. Arlington VA: Center for Naval Analyses – Analysis and Solutions. Available at: <https://www.cna.org/analyses/2016/water-resource-competition> (Accessed: March 2, 2026).
- Starr, J.R. (1991) "Water wars," *Foreign Policy*, 82, pp. 17–36. Available at: <https://doi.org/10.2307/1148639>.
- UN-Water (2013) *Water security and the global water agenda – A UN-Water analytical brief*. Hamilton: United Nations University. Available at: <https://www.unwater.org/publications/water-security-and-global-water-agenda> (Accessed: March 2, 2026).
- Vasudeva, V. (2024) "Glacial lakes multiply in Himachal Pradesh and Tibet, posing a threat to lives and infrastructure downstream," *The Hindu*, 11 August. Available at: <https://www.thehindu.com/sci-tech/energy-and-environment/glacial-lakes-multiply-in-himachal-pradesh-and-tibet-posing-a-threat-to-lives-and-infrastructure-downstream/article68510232.ece> (Accessed: March 2, 2026).
- UNFAO (2011) *AQUASTAT – FAO's global information system on water and agriculture*. Food and Agriculture Organization of the United Nations. Available at: <https://www.fao.org/aquastat/> (Accessed: March 2, 2026).
- Watts, J. (2010) "Chinese engineers propose world's biggest hydro-electric project in Tibet," *The Guardian*, 24 May. Available at: <https://www.theguardian.com/environment/2010/may/24/chinese-hydroengineers-propose-tibet-dam> (Accessed: March 2, 2026).
- Wuthnow, J., Limaye, S. and Samaranayake, N. (2020) "Brahmaputra: A conflict-prone river takes a step backwards," *War on the Rocks*, 23 December. Available at: <https://warontherocks.com/2020/12/a-conflict-prone-river-takes-a-step-backwards/> (Accessed: March 2, 2026).
- Xiao, F. (2021) "Seismic activity in the Three Gorges region – 2021 update," *Probe International*, 25 February. Available at: <https://journal.probeinternational.org/2021/02/25/seismic-activity-in-the-three-gorges-region-2021-update/> (Accessed: March 2, 2026).
- Xie, L., Zhang, Y. and Panda, J.P. (2018) "Mismatched diplomacy: China–India water relations over the Ganges–Brahmaputra–Meghna River Basin," *Journal of Contemporary China*, 27(109), pp. 32–46. Available at: <https://doi.org/10.1080/10670564.2017.1363014>.
- Zhang, H. (2016) "Sino-Indian water disputes: The coming water wars?," *WIREs Water*, 3(2), pp. 155–166. Available at: <https://doi.org/10.1002/wat2.1123>.