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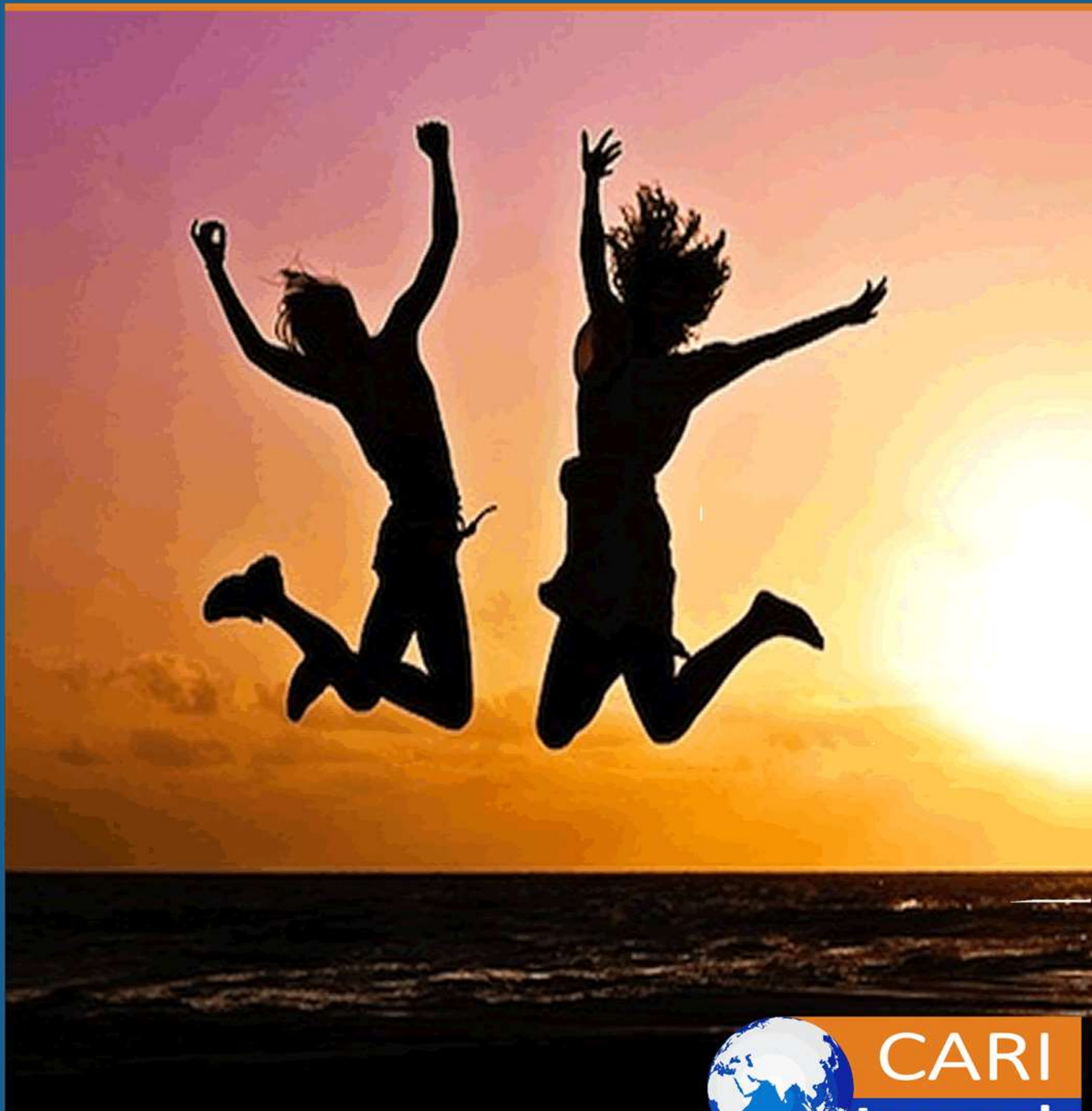

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Access to Freshwater and Bilateral Relationships among Ganges-Brahmaputra-Meghna (GBM) Basin States

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Abstract

Purpose: The primary objective of this study is to examine how access to freshwater influences bilateral relationships among Ganges-Brahmaputra-Meghna (GBM) basin states.

Methodology: The study employs a qualitative analysis of publicly available primary and secondary scholarships, treaties, policy documents, and institutional reports related to transboundary water governance in the GBM basin. The analysis is based on resources accessed through openly accessible documents, journals, and libraries.

Findings: The study finds that unilateral control and diversion of freshwater-flows by upstream states erode trust and mutual credibility for cooperative commitments, while water scarcity generating domestic livelihood stress in downstream states. Absence of multilateral institutions prevents multilateral water-governance by limiting political space for regional cooperation. Despite having potential for harboring multilateral cooperation, the current context of water disputes basin undermines the Political and Economic Integration (PEI) across GBM basin states.

Unique Contribution to Theory, Practice and Policy: The study advances transboundary water governance and international political economy by framing freshwater scarcity as a structural constraint to political and economic integration. Extending hydro-political analysis to understudied GBM basin context, it shows how upstream asymmetries erode trust, weaken institutions, and impede regional integration, undermining the need for basin-wide cooperation.

Key words: *Bilateral Relations, Freshwater, GBM River Basin, Transboundary Water Governance.*

1. Introduction:

Freshwater is a vital resource underpinning economic growth, agricultural production, hydropower generation, industrial development, and household consumption. Over time, access to and control over freshwater has become increasingly contested due to population growth, rapid economic development, and climate change. As a result, freshwater has emerged as a growing source of both intra-state and inter-state disputes (Gleick, 1993; Wolf, 1998).

Across many regions, disputes over freshwater have increasingly made water sharing a focal point of bilateral contention. In such contexts, upper riparian states located upstream often exercise disproportionate control over shared flows. They selectively adhere to international water norms while prioritizing domestic demands, thereby constraining lower riparian states downstream, which, in turn, exacerbates geopolitical tensions within shared river basins.

Contemporary interstate water disputes span major basins worldwide, including the Euphrates-Tigris (Turkey-Syria-Iraq), the Jordan (Israel-Lebanon-Jordan-Palestine), the Nile (Egypt-Ethiopia-Sudan), the Colorado (United States-Mexico), and Central Asia's Aral region (Kazakhstan-Uzbekistan-Turkmenistan-Tajikistan-Kyrgyzstan) (Elhance, 1997; Michel et al., 2012). These cases highlight recurring conflict dynamics in transboundary freshwater governance.

Disputes over access to freshwater among the Ganges, Brahmaputra, and Meghna (GBM) basin states reflect these global patterns but carry heightened stakes given the basin's population density and the strategic importance of regional powers. Growing demand for hydropower, irrigation, and domestic use has intensified competition over shared flows, shaping bilateral politics, and regional economic dynamics. Yet GBM hydropolitics remain underexamined in relation to how water-related disputes spill over into wider bilateral contestation while impeding Political and Economic Integration (PEI).[1]

The study employs a qualitative analysis of publicly available primary and secondary scholarships, treaties, policy documents, and institutional reports related to transboundary water governance in the GBM basin. Employing the framework of water as a source of conflict, it examines how competing dependencies on shared flows can escalate tensions and undermine cooperation. The study contributes to the literature on transboundary water governance and international political economy. It conceptualizes freshwater scarcity simply not as a source of bilateral contestation, but as a structural constraint on PEI. It extends the hydro-political analysis beyond well-studied river systems — Nile and Mekong — to one of the most densely populated regions. Finally, though a comparative analysis of bilateral relationships among China, India, Nepal, Bhutan, and Bangladesh, it shows how asymmetries in upstream control systematically erode trust, weaken institutional cooperation, and impede regional integration, despite the absence of overt interstate

[1] The Political and Economic Integration (PEI), here, refers to the degree to which riparian states institutionalize cooperation through trade, infrastructure connectivity, exchange of energy, joint governance mechanisms, and diplomatic trust to coordinate policies, share benefits and accept constraints.

conflict. The paper proceeds as follows: Section 2 reviews international river governance and water conflict; Section 3 outlines GBM rivers and population dynamics; Section 4 analyzes freshwater disputes, bilateral relations, and PEI; and Section 5 concludes.

2. International River Governance and Water as a Source of Conflict:

Water is a vital, irreplaceable resource that transcends political boundaries, varies across space and time, and faces multiple competing demands (Chowdhury, 2010). The central governance challenge is allocation — who gets how much, when, and under what conditions. Although national and international water policies exist, international frameworks remain weak, fragmented, and largely unenforceable (Chowdhury, 2010). The Helsinki Rules (1966) affirmed states' utilization of waters within their territories (Wolf, 1999). Further norms were codified in the 1997 United Nations Watercourses Convention, which sought to balance equitable and reasonable utilization with the obligation not to cause significant harm to co-riparian states (Salman, 2007). However, these frameworks lack effective enforcement mechanisms and are yet to achieve universal implementation.

The 'Blue Peace' approach, developed by Strategic Foresight Group (in partnership with the Governments of Switzerland and Sweden), promotes sustainable water management by framing transboundary water challenges as opportunities for cooperation (Hasan, 2014). It advances diplomatic engagement and benefit-sharing to mitigate disputes and encourage regional cooperation. Nonetheless, evidence to its effectiveness is mixed and context dependent. This initiative tends to have limited influence on bargaining outcomes where states are unwilling to institutionalize cooperative mechanisms.

Because freshwater flows across borders, claims over shared rivers combine *de facto* and *de jure* control — control in practice and control in law, respectively (Christopher, 2013). Upstream states often invoke absolute territorial sovereignty — de facto control — whereas downstream states emphasize the integrity of the watercourse — de jure control (Christopher, 2013; Gupta, 2016). Although contemporary norms emphasize equitable and reasonable use and the duty to avoid significant harm, bargaining power and development of asymmetries frequently shape outcomes (Gupta 2016; Mutembwa, 1998).

Water diversion based on territorial rights – through hydropower dams, agricultural extraction, and industrial use – frequently triggers disputes among basin states. Large-scale hydropower projects may cause ecological imbalance, increase flood vulnerability, and displace populations, thereby heightening interstate tensions (Chellaney, 2014). As a result, water disputes need to be understood within broader political, socio-economic, and strategic contexts rather than through hydrological factors alone (Mutembwa, 1998). Naff (1993) similarly suggests that the complexity of freshwater governance requires multiple analytical frameworks rather than a single explanatory model.

Water possesses distinct characteristics that heighten its conflict potential. As a non-substitutable commodity and terrain-based resource, scarcity compels states to seek territorial control over

water-flows, transforming water into a security issue in international relations (Mutembwa, 1998; Stetter et al., 2011). Naff's (1993) power matrix model evaluates water conflict risk by examining actors' interests, riparian position, and capacity to project or defend power.

States may pursue cooperation or conflict depending on whether their water needs are supported or constrained by other riparian actors. Upstream states often hold structural advantages by controlling the quantity and quality of downstream flows. Conflict is most pronounced when downstream states experience scarcity while perceiving upstream actions as threats to vital interests. Egypt's opposition to Ethiopia's hydropower development exemplifies why downstream states may adopt confrontational strategies under perceived water insecurity (Mutembwa, 1998).

Scholars debate whether water scarcity primarily fuels conflict or can also incentivize cooperation. Some argue that scarcity, uneven allocation, and unilateral water projects can catalyze intra- and inter-state tensions (Aron, 1999; Christopher, 2013; Haftendorn, 2000; and Starr, 1991). Empirical cases – including Rwanda, Darfur, and Syria – demonstrate how water stress can interact with political and socio-economic drivers of violence, and instability (Karnieli et al. 2019; Kevane, 2008; and Shelby et al. 2017).[2] Others contend that rising scarcity and hydropower demand may encourage cooperation through water-sharing and energy-trade arrangements (Aron, 1998; Biswas, 2008; and Fegueres et al., 2003). Because water vulnerability is shaped by political and economic contexts, supply adequacy, and shared dependence (Gleick, 1993). Empirical examples include cooperative water arrangements among states; Romania, Hungary, and Austria (Linnerooth et al., 1996); India and Nepal (Pokharel, 2007); and the Amazon River water sharing in Latin America (Lee, 1995).

In South Asia, control over transboundary rivers has brought major powers close to confrontation (Christopher, 2013). China-India tensions over the Brahmaputra and downstream impacts of Indian river interventions in Bangladesh underline the region's hydro-political volatility in the twenty-first century (Rahman et al. 2010; Wolf, 1998). Within the GBM basin, relative and absolute water shortages are key reasons to intensify internal unrest and strain bilateral relations among the states (Stefan, 2006). When water scarcity is perceived as a security concern, mistrust between upper and lower riparian states deepens, undermining the prospects of cooperative water governance and constituting a major impediment to PEI among GBM basin states.

3. The GBM Basin: River, People and Water Use

The Ganges-Brahmaputra-Meghna (GBM) river basin, comprising three major Himalayan river systems, is among the world's largest freshwater flow systems, and supports extensive human populations and diverse ecological systems across South and East Asia (Chowdhury and Ward,

[2] Earlier works by Mutembwa (1998) and Starr (1991) suggest that Future conflicts are likely to intensify around increasingly scarce water resources, particularly in regions with high population growth and limited supply such as the Maghreb and the Middle East

2004; JRCB, 2011).[3] The basin covers approximately 1.76 million km^2, of which about 18% lies in China, 62% in India, 7% in Nepal, 4% in Bhutan and 8% in Bangladesh (Hasan and Mulamoottil, 1994). This section outlines the courses of the GBM rivers and the populations dependent on their freshwater flows. It then summarizes major water-development projects and discusses water-sharing dynamics among upper and lower riparian states.

Rivers and their Courses

The GBM rivers originate from three different geographical directions and converge before discharging into their common outlet, the Bay of Bengal. The Ganges River, known as the *Padma* in Bangladesh, originates from the Gangotri Glacier on the Southern slopes of the Himalayas and flows approximately 2,600 km before joining the Meghna (Shamsudduha and panda 2019). Its delta spans about 1,093,450 km^2 , shared among India, Nepal, Tibet, and Bangladesh[4] (JRCB, 2011). While the Ganges has long served as a lifeline for populations across these countries, recent studies show declining dry season discharge and increasing sediment imbalance (Khan et al., 2016; Higgins et al., 2018). Regulatory interventions and river-liking projects undertaken by upper riparian states have significantly altered downstream flows and suspended sediment transport with direct implications for agricultural productivity and deltaic stability (Khan et al., 2016; Higgins et al., 2018).

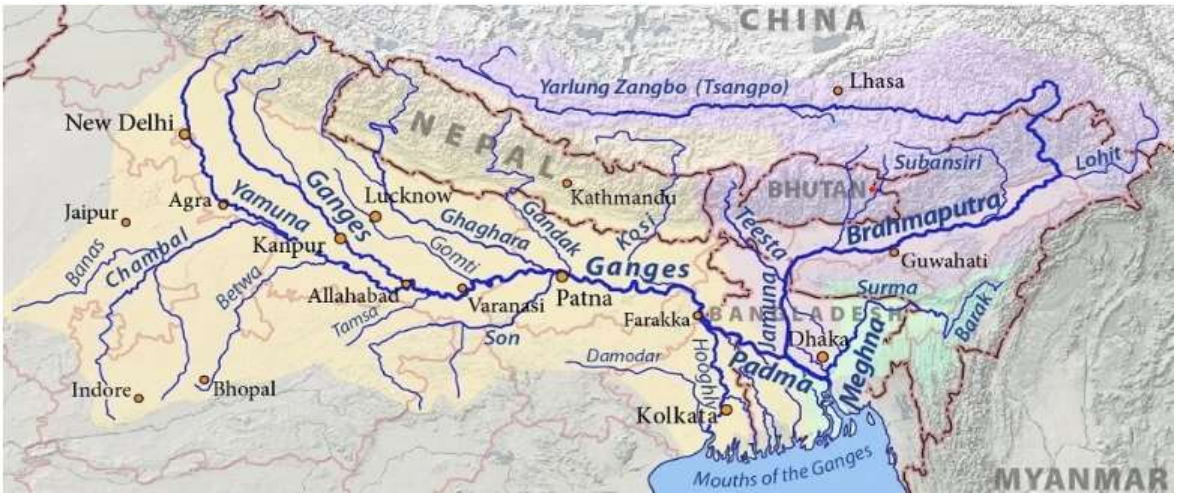

Figure 1: The GBM river systems and their tributaries (WBPSCUPSC, 2019).

[3] At its terminus, more than 1 million cubic feet per second of water flows into the Bay of Bengal (JRCB, 2011). There remains debate as some scholars (like, Hasan and Mulamoottil, 1994) argue that the GBM river basin's discharge is the second largest of freshwater flow in the world behind only the Amazon River.

[4] Total area of which Bangladesh shares 46,000 km2, India 861,400 km^2, Nepal 146,000 km^2 and Tibet shares 40,4000 km2 (JRCB, 2011).

The Brahmaputra River, known as *Yalung Zangbo* in China and *Jamuna* in Bangladesh, originates in Tibet on the northern slopes of the Himalayas. It is the longest transboundary river in the Himalayan region, flowing approximately 2,900 km before joining the Padma (Shamsudduha and Panda 2019). Its basin covers around 570,000 km², with about 330,000 km² in Tibet (China), 195,000 km² in India, 34,000 km² in Bangladesh, and smaller portions extending into Bhutan and Nepal (JRCB, 2011).

The Meghna River, known as the *Barak* in India, originates in the hills of Manipur and flows through its two major branches – the Surma and the Kushiara — which later converge in Bangladesh to form the Meghna. The river then joins the Padma and flows into the Bay of Bengal as the Lower Meghna. It crosses about 900 km and has a catchment area of around 77,000 km² shared between India and Bangladesh (JRCB, 2011). The lower Meghna constitutes one of the world's largest river outflows, combining with the waters of the Ganges, Brahmaputra, and Meghna before ending the Bay of Bengal (FAO 2011).

People and Water Use in the GBM Basin

The hydrological characteristics of the GBM system – including extensive surface water, wetlands, and seasonal flooding across China, India, Nepal, Bhutan, and Bangladesh – have rendered this basin one of world's most fertile alluvial regions, with Bangladesh hosting the largest delta globally (Ahmad et al., 2001; JRCB, 2011; Shamsudduha and Panda 2019). The basin houses approximately 700 million people, making it the most densely populated river basin in the world (Shamsudduha and Panda 2019). Historically, the GBM river systems have been central to human survival in the region, supporting agriculture, drinking water, navigation, and industrial uses while nurturing a thread of vast diversity of cultures, arts, faiths, and ethnicities. However, extensive hydropower development, irrigation infrastructure, and embankments — completed, ongoing, and proposed — are increasingly disrupting natural flows regimes, causing significant harm to the fragile ecosystems, and intensifying transboundary tensions.

Water Use and Development Projects in the Ganges System

The Ganges has historically sustained the largest population within the GBM basin, yet it is also the most heavily regulated river. Extensive dams, barrages, and embankments – most notably the Farakka Barrage – have been constructed by India to control flooding, divert water for irrigation, and maintain navigability.[5] Given India's short monsoon season (half of nationwide precipitation falls over just 15 days), during which nearly 90 percent of river flows occur within four months (Briscoe, 2005), the country remains highly dependent on surface water. To address regional water scarcity, India initiated the River Linking Project in the early 1990s, aiming to redistribute water from surplus to deficit regions by interconnecting major rivers, including the

[5] The Farakka Barrage is just about 16 kilometers from Bangladesh border. The key argument of the gigantic project was to divert water flow to maintain the navigability in several ports especially in the Haldi river in the West Bengal. For details, see Islam (2024) and Mamun (1984).

Ganges (JRCB, 2011). These interventions have substantially altered downstream flow volumes, sediment transport, and seasonal variability, with direct consequences for agriculture, fisheries, and salinity intrusion in downstream Bangladesh.

Water Use and Development Projects in the Brahmaputra System

The Brahmaputra River is characterized by extreme seasonal flow variability, high sediment loads, and its passage through five countries. However, in recent decades, the river has witnessed a growing number of hydropower and water-regulation infrastructures in upper reaches. In China, the upper parts of the river — known as the *Yarlung Zangbo* — have become focal points for hydropower expansion and water regulation to meet energy demand and regional development in Tibet (Lyu et al., 2023). At present, there are more than 10 various projects operational in both Chinese and Indian part of the river (Bao et al., 2023). In India, especially in the provinces of Arunachal and Assam, hydropower projects, embankments, and flood-control dams have expanded to meet growing energy demands and mitigate flooding risks (Varma and Hazarika, 2018). Nepal and Bhutan, despite occupying smaller portions of its long journey, have also developed hydropower projects to supply electricity to regional grids (Lad and Jaybhaye 2025), largely partnership with India. While these projects generate economic benefits for upper riparian states, but collectively reduce downstream water availability, and alter sediment delivery, increase sand deposition, destabilize floodplains and deltaic ecosystems, particularly affecting Bangladesh (Uddin et al., 2024).

Water Use and Development Projects in the Meghna System

Among the GBM River, the Meghna river system is comparatively less regulated, yet it is increasingly affected by upstream infrastructure projects undertaken by India. Embankments and hydropower projects, like the Tipaimukh Dam, aimed at flood control and electricity generation, have raised significant concerns in lower riparian regions (Uddin et al., 2024). Although these projects are often portrayed as economically beneficial and politically favorable within India, they have altered flow timing and sediment dynamics, complicating floodplain ecology, fish migration, and sediment disposition in the downstream – Bangladesh (Uddin et al., 2024; Varma and Hazarika, 2018).

Downstream Dependency and Vulnerability

China accounts for roughly 20% of the world's population but possesses only about 7% of water world's freshwater resources, fearing increasing water scarcity due to industrial pollution and intensive irrigation. India, home of approximately 17% of the world's population, has access to less than 4% of global water resources, making it heavily dependent on rivers originating beyond its borders (Christopher, 2013). Rapid population growth, expanding industries, and agricultural demand have intensified water appropriation pressures. Bangladesh, by contrast, supports about 2.15% of the world's population, but possesses only 0.24% of the world's freshwater resources, rendering it almost entirely dependent on transboundary river flows (Christopher, 2013).

As the lowermost riparian state, Bangladesh is particularly vulnerable to upstream water diversions. As a moribund, deltaic country dependent on transboundary flows, for Bangladesh any diversion of water flows means environmental devastation for the low-income, densely populated country, and serious consequences for agriculture and fishing, leaving it with fewer resources and options to respond to challenges created by water scarcity (Christopher, 2013).

4. Freshwater, Bilateral Relationships, and Political and Economic Integration (PEI):

As with other transboundary freshwater systems, access to freshwater in the GBM basin plays a crucial role in shaping bilateral relationships and prospects for Political and Economic Integration (PEI). While water sharing and hydropower cooperation have the potential to foster interdependence among states, water disputes in the GBM context undermine the PEI in three ways. Firstly, unilateral water control by upper riparian erodes trust and mutual credibility for cooperative commitments. Secondly, water scarcity, especially in the dry season, generates domestic livelihood stress in downstream states, which limits political space for regional cooperation. Finally, absence of multilateral institutions reinforces bilateralism rather than multilateralism, which, more often, generates contention than cooperation. By analyzing water-sharing arrangements and developmental interventions undertaken by upper riparian states, this section shows how disputes over freshwater constitute a structural obstacle to PEI among GBM basin states.

Although joint water commissions exist between Bangladesh and India, and between India and Pakistan, no comparable commission or study group operates between India and China. Owing to the long-standing preference of both China and India for bilateral approaches that prioritize national interests over basin-wide coordination, the GBM river system has yet to realize its full cooperative potential (JRCB, 2011). The Joint River Commission (JRC), established by India and Bangladesh under the Indo-Bangladesh Treaty of Friendship, Cooperation and Peace in 1972, was mandated to promote cooperation on water sharing, irrigation, flood management, and cyclone control (Bullock and Darwish, 1993). The commission's studies and negotiations contributed to successive agreements on Ganges water sharing in 1975, 1978 and ultimately in 1996 (Wolf, 1998).

Water Sharing and Bilateral Relationship between GBM States

Water sharing among GBM basin states has increasingly become a contentious bilateral issue. As demands for hydropower, irrigation, household consumption, and flood control intensify, large-scale water development projects undertaken by upper riparian states have constrained regular water flows for lower riparian states, deepening tensions across the basin. The following cases demonstrate how water has become a critical issue of securitization and bilateral relationships.

China-India: Brahmaputra and Upper-Upper Riparian Tensions

Among the various disputed issues between China and India, water has emerged as a major component of their bilateral relationship. Tensions have intensified with China's plans to construct additional dams on the Brahmaputra, raising concerns in India over potential reductions in downstream flows (Christopher, 2013). Upstream control and diversion of the Brahmaputra threaten to generate water scarcity and food insecurity downstream, placing India at a strategic disadvantage. China's expanding hydropower infrastructure could enhance its domestic energy and food security while heightening vulnerability for India, perceived as a nearly existential hazard (Christopher, 2013). These developments are also shaped by international climate-policy incentives that promote renewable energy expansion, including hydropower, under global frameworks such as the Kyoto Protocol (Haque, 2024).

China has consistently denied plans for large-scale hydrological interventions along the Brahmaputra. In 2013, following reports of a proposed dam, China assured India that any construction would involve an off-the river kind of smaller dam (Christopher, 2013). Later that year, however, China rejected India's proposal for a joint mechanism to monitor activities on the Brahmaputra, declining formal water negotiations with India (Richardson, 2009). The construction of additional dams would likely reduce downstream water availability, disrupt natural flood cycles, and impede sediment transport, with cascading effects on agriculture, fisheries, and riparian and marine ecosystems. These changes would further affect water-based industries and long-term economic growth in the downstream, India. Moreover, in the absence of water-sharing mechanisms, unilateral control and diversion of flows could intensify water securitization and limit prospects for cooperative integration.

India- Bangladesh: Upper-Lower Riparian Tensions

Water has remained a central bilateral issue between India and Bangladesh since Bangladesh's independence. As the lowermost riparian state in the GBM basin, Bangladesh is particularly vulnerable to upstream water diversion by India. Scientific estimates suggest that a 10 percent reduction in dry-season flows could severely affect large agricultural areas where 80 percent of small farmers depend on GBM rivers and their tributaries (The Guardian, 2013).

Contention over water diversion gained prominence in 1972 with India's operation of the Farakka Barrage on the Ganges [6] (JRCB, 2011). Although India and Pakistan had signed the Indus Waters Treaty in 1960[7] (Kraska, 2003), Bangladesh — then East Pakistan — was excluded, leaving one of the most densely populated and river-dependent regions under persistent water uncertainty. In

[6] Farakka Barrage is 2,240 meters (7,350 ft) long and located only 16 kilometers away from Bangladeshi border (JRCB, 2011). India laid down the stone of the Farakka Barrage to withdraw water from the Ganges flowing through between India and Bangladesh in 1961, subsequent year of signing the Indus Waters Treaty in 1960.

[7] The Indus River treaty was signed considering the five rives flowing between India and Pakistan (then West Pakistan), and still respected to this day. For details, see Kraska (2003).

1996, India and Bangladesh signed a 30-year Ganges Water Treaty, granting Bangladesh 50 percent of available flows at Farakka during the dry season when discharge falls below 1988.18 cubic meters per second. However, the treaty lacks guaranteed minimum flows and does not account for long-term hydrological variability, limiting its effectiveness for Bangladesh (Haftendorn, 2010). India's diversion of Ganges water during lean months to maintain navigability at the Kolkata port contrasts sharply with Bangladesh's need for dry season flows to support irrigation and counter coastal salinity intrusion (Mirza, 1998; Rahman et al., 2013). Reduced dry season flows accelerate riverbed siltation and channel shallowing, while monsoon floods become more destructive due to diminished river depth, causing severe riverbank erosion and widespread flooding (Mazumdar, 2014).

Apart from the Ganges, India's construction of the Tipaimukh hydropower project on the Barak River has intensified tensions over Meghna flows. Bangladesh has expressed concerns regarding potential diversion and environmental impacts, while India maintains that the project is intended solely for flood control and power generation. Despite India's assurance, Tipaimukh dam created an uproar within Bangladesh against India's unilateral water diversion.

In Bangladesh, water is both scarce and abundant. Monsoon flooding and dry-season water shortages disrupt crop production, fisheries, navigation, and biodiversity. Persistent riverbank erosion results in extensive land loss, displacing millions, and undermining livelihood. Internally Displaced People (IDP) often migrate to urban centers or cross borders, where economic marginalization may push these IDP into illicit activities, including cross-border smuggling (Chowdhury, 2010). These socio-environmental stresses have increasingly elevated water issue from a domestic challenge to a critical concern in Bangladesh's bilateral relations with India.

Tensions over water flows between India and Bangladesh, exacerbated by political and bureaucratic divisions within India — particularly between central and state authorities — further complicate water-sharing negotiations between India and Bangladesh, leading to water shortages in Bangladesh (Dutta, 2010). In 2010, Bangladesh urged India to pursue a comprehensive agreement covering all 54 shared rivers, but progress has remained limited (Mazumdar, 2014). The India-Bangladesh context indicates how persistent asymmetry in water control prevent functional cooperation. At the same time, the institutional agreements — bilateral water treaty between India and Bangladesh — without enforceable guarantees fail to protect downstream interests and perpetuate the vulnerability.

Secondary Riparian States: Nepal and Bhutan

Nepal and Bhutan occupy smaller but critical portion within the hydro-politics of the GBM basin. Being secondary riparian states, both countries have been aggressive in pursuing hydropower while capitalizing their mountainous terrains as part of their central development strategies (Biswas, 2008; Lad and Jaybhaye, 2025; and Pokharel, 2007). At present, there are more than 6 various projects — established and operated in collaboration with India — operational in both

Nepal and Bhutan part of the GBM systems to feed regional and national grids (Lad and Jaybhaye, 2025).

Although with smaller share of the GBM basin, Nepal and Bhutan play a significant role in shaping the hydrological pattern due to their geographic locations. Dam construction and reservoir operations in upstream deeply influence the downstream flow, especially during the dry season when water availability is most politically sensitive (Biswas 2008; Crow and Singh, 2009; and Uddin et al., 2024). Flow regulation to maximize electricity generation alters seasonal discharge towards downstream, causing water scarcity when needed for lower riparian states. Hydropower development in Nepal and Bhutan has been shaped by their domestic energy needs and by strategic bilateral arrangements with India. With these asymmetrical water regulation, upstream benefits — Nepal and Bhutan's needs for electricity and India's strategic and economic benefits — are consolidated, while ecological and hydrological risks are transferred to downstream. Bangladesh, as the lowermost riparian state, bears the greatest costs of altered flows, reduced sediment, and devastating floods during monsoon. Despite persistent disputes over GBM basin rivers, Nepal and Bhutan have largely maintained a strategic silence in broader transboundary water debates. Therefore, their position contributes to reinforcing fragmented and inequitable water governance in the GBM basin.

Disputes over Water Flows: Impede to Political and Economic Integration (PEI)

Water is a fundamental necessity in South Asia, where most countries are largely agrarian (Malhotra, 2010). The GBM river basin sustains populations from the Himalayan Ranges to the Bay of Bengal; however, access to freshwater has increasingly become a source of tension both within and among basin states. As competition over water intensifies, GBM basin states are engaged in a risky regional race for water resources (The Guardian, 2013). As a result, deepening contestation and conflict over water sharing have emerged as major impediments to Political and Economic Integration (PEI) in the region.

China-India: Security and Strategic Rivalry

China and India, the two major Asian powers, are rapidly expanding hydropower development in the world's deepest valleys within the GBM river systems (The Guardian, 2013). As Brahma Chellaney notes, "China-India disputes have shifted from land to water. Water is the new divide and is going center stage in politics" (The Guardian, 2013). China's control and diversion of the Brahmaputra threaten downstream water availability in India's Arunachal province, heightening food security concerns. Facing such risks, India may be compelled to adopt confrontational strategies to secure its water share, with escalation becoming increasingly difficult to reverse (Christopher, 2013). The risk is further amplified by the absence of any formal water-sharing agreement between China and India on the Brahmaputra.

Although Chinese water projects on the Mekong River have caused environmental and social disruption in downstream countries, particularly in Thailand, Vietnam, Laos and Cambodia,

Mekong riparian states have largely avoided direct confrontation with China (Richardson, 2009). India, however, is unlikely to follow this pattern given the broader strategic rivalry involving border disputes and Tibet. Continued Chinese intervention on the Brahmaputra flow may thus push China and India toward a collision course over water control (Christopher, 2013).

India-Bangladesh: Asymmetry, Leverage, and Downstream Vulnerability

As the lowermost riparian state receiving residual flows, Bangladesh faces persistent dry-season water shortages that dominate its negotiations with India (Ahmed 2001). Irregular river flows — marked by scarcity during the dry-season and excess during the monsoon — produce severe socio-economic impacts, while Bangladesh's limited economic and military capacity constraints its bargaining power.

To gain leverage, Bangladesh has at times used its strategic geographic location by hesitating to grant transit rights for Indian trade and energy corridors, including regional highway and pipeline projects, despite growing economic ties between these two countries (Mazumdar, 2014). Historical grievances, such as India's re-negation of earlier commitments regarding the issues of border settlement and water sharing, have reinforced perceptions of Indian unreliability in Bangladesh (Mazumdar, 2014). Water induced internal unrest further weakens governance and border control, as affected populations engage in illicit activities such as cross-border smuggling, creating security spillovers for India.

Institutional Deficits and Regional Integration Failure:

Water disputes in the GBM basin are widely understood as manifestations of deeper political deficits in South Asia (Malhotra, 2010). While hydrological variability, upstream diversion, climate change, and water mismanagement intensify water scarcity, the absence of effective multilateral water governance mechanisms among GBM basin states remains the primary constraint on cooperation. From a climate-justice perspective (Haque, 2024), this institutional vacuum disproportionately burdens lower riparian states, sustaining asymmetries in vulnerability and access to freshwater resources. This inequitable burden, in turn, perpetuates water disputes and impedes PEI among GBM basin states.

Regional platforms like the South Asian Association for Regional Cooperation (SAARC) — despite decades of existence and thematic commitments to climate change, trade, and connectivity — have failed to reach consensus on water sharing[8] (Malhotra, 2010). Similarly, Initiatives including the South Asian Free Trade Agreement (SAFTA), Bangladesh-China-India-Myanmar Cooperation (BCIM), and Bangladesh-India-Myanmar-Sri Lanka-Thailand Economic Cooperation (BIMSTEC) remain largely paper-based, constrained by unresolved water disputes that undermine trust and collective action. As a result, GBM river basin states remain fragmented,

[8] During the 16th SAARC meeting, nations under the Banner of "A Green Happy South Asia", failed to reach a consensus regarding the water issue. For details, see Malhotra (2010).

limiting their ability to leverage regional integration within broader international political and economic frameworks.

5. Conclusion:

Water is a central issue of bilateral negotiation in South Asia, weighing the depth and direction of interstate relationships as freshwater becomes scarce for irrigation, food production, industrial use, and household consumption. Despite having potential for fostering multilateral cooperation, current context persistent of water disputes continues to undermine the Political and Economic Integration (PEI) across the region. Unilateral control and diversion of freshwater flows by upstream states erode trust and mutual credibility for cooperative commitments, while water scarcity generates domestic livelihood stress in downstream states, significantly eroding mutual trust. These dynamics have increasingly securitized water relations, especially between India and China over the Brahmaputra, and between Bangladesh and India over the Ganges and Meghna, whereas reinforced asymmetrical bargaining positions for secondary riparian states – Nepal and Bhutan. Facing predicted and persistence of water scarcity, GBM riparian states have increasingly sought leverage through alternative diplomatic and strategic means, recalibrating their bilateral engagements with neighbors. Moreover, absence of effective multilateral institutions among the GBM basin states significantly constrains political space for multilateralism and cooperation and piles up the obstacles against the PEI. To address these challenges, GBM basin states should focus on establishing a multilateral transboundary water governance framework incorporating minimum-flow guarantees, regular and institutionalized data-sharing, joint environmental impact assessments, and coordinated dam operation protocols. With basin-wide hydrological transparency and benefit-sharing arrangements, such as energy trade and climate adaptation finance, the water governance framework would build confidence among the riparian states, essentially reducing securitization of freshwater flow and restoring mutual trust. Without such a multilateral water governance framework, freshwater scarcity will continue to recalibrate bilateral strategies toward competition rather than cooperation, undermining long-term regional stability and PEI in the GBM basin.

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