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Can South Asia Share Its Rivers?

GARETH PRICE AND SONALI MITTRA

The shared rivers of South Asia have a troubled past and a worrying future. The supply of water delivered by the region's river systems will be subject to the impact of climate change. Unless agricultural practices change dramatically, rising demand could strain the water supply as new industries emerge, urbanization accelerates, and the population dependent on the rivers increases.

More than 200 million people currently depend on the Indus River, and around 650 million people on the Ganges-Brahamaputra-Meghna river system. The population reliant on these waters has more than doubled over the past 40 years. While population growth is slowing, the region's prospects looks precarious unless new approaches are adopted. Some river-sharing agreements, notably the Indus Water Treaty (IWT) between India and Pakistan, are generally seen as successful, but they are not irrevocable. Water—and control over it—is increasingly talked about as part of a country's foreign-policy tool kit.

Rivers are also associated with the region's rich cultural and religious heritage. Perceptions of their central role in the lives of nations have shaped the policy and politics of water sharing in the region. Many people across South Asia conceive of their rivers as divine and inexhaustible natural resources beyond the control and management of humans.

The Ganges, for instance, is worshipped as a goddess and several key pilgrimage sites are situated along its banks. Despite increasing levels of pollution and declining or more erratic water flows, the river continues to hold great spiritual significance. However, this has failed to translate into or encourage efficient practices and policies for joint management. Moreover, it has led to a rather irrational perception that water belongs to individuals, communities, or states, and is to be used at their discretion. This fundamental notion runs deep within the conflict between different states in India over the sharing of river waters.

River sharing between neighboring countries is also seen as a zero-sum game. Volumetric divisions of the river waters flowing between India and Pakistan, and between India and Bangladesh, are far removed from the actual demand for and use of water on either side of the border, leading to conflict. Over the years, these disputes have deepened to the extent that water is seen as inherently a source of conflict rather than productivity or cooperation.

While there is an agreement between India and Pakistan regarding each of their shared rivers, there is no agreement on tangential issues, such as groundwater extraction, which can affect the other country. India and Bangladesh share 54 rivers, but have an agreement for just one of them. Likewise, only three agreements are in place for the many rivers that Nepal and India share. Emerging issues—most notably climate change—are not covered by any of these agreements.

Regional water-governance institutions have arisen in response to conflict. Both the IWT, signed by India and Pakistan in 1960, and the 1996 Ganges Waters Treaty between India and Bangladesh resulted from a series of negotiations to resolve clashes over water rights. The disputes were distinct, given the different political relationships between India and its downstream neighbors, but both treaties reflected similar values and perceptions of the rivers. These values influenced the negotiators' approach toward river management, including the distribution of water between the countries, as well as the conflict-resolution and risk-management mechanisms included in the treaties.

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Are the current river-sharing institutions resilient enough to withstand the uncertainties of climate change and the socio-political disruptions expected to accompany it? How can they be improved? Answering these questions requires examining the narratives ingrained in the conflicts over transboundary rivers in South Asia.

Dividing the Indus

The Indus River is of critical importance for both India and Pakistan. According to some estimates it irrigates more than 95 percent of Pakistan's agricultural land. Much potential hydropower remains untapped, providing an attractive option to meet Pakistan's energy needs. The Indus flows through India's breadbasket states of Punjab and Haryana. In addition to agriculture, India depends on the Indus and its tributaries to meet its own energy needs, though 54 percent of its potential remains untapped, according to the Central Water Commission.

Brokered by the World Bank, the IWT has been described as akin to a divorce settlement. The treaty allocates the western tributary rivers of the Indus—the Indus itself, Jhelum, and Chenab—to Pakistan and the eastern rivers—the Ravi, Beas, and Sutlej—to India. Dividing the six rivers between the two countries and defining water rights proved difficult. At the time of Partition in 1947, the newly independent nations signed an Inter-Dominion Accord whereby Pakistan agreed to pay compensation to India for releasing water from the Indus. Negotiations on a bilateral agreement continued for a decade as both sides remained adamant about seeking maximum control over the Indus and its tributaries, though the needs of the two countries differed in scale and intensity.

Across South Asia, water management is generally poor.

Pakistan's insistence that water should be allocated in accordance with historical usage was unacceptable to India, which also refused to pay for the construction of canals and storage to make up for Pakistan's loss of water from the eastern rivers. Ultimately, World Bank arbitration led to a new formula for allocating the waters and offered the option of external financing to break the deadlock. The World Bank's solution prioritized engineering and economics as a means of sidelining political differences. The technical provisions of the treaty are generally regarded as being highly effective. As recently as 2011, the US Senate Foreign Relations Committee described it as the "world's most successful water treaty."

Under the IWT's mechanisms for dispute resolution, in the event one party claims that the treaty has been breached, the Permanent Indus Commission, which includes one commissioner from each country, tries to resolve the issue. If the disagreement persists, the case is referred to a "neutral expert" or a court of arbitration created in consultation with both governments and/or the World Bank. Two annexes to the treaty provide a comprehensive list of the rules and procedures to be followed by the neutral expert and the court of arbitration.

The necessary qualifications for commissioners, the procedures for their appointment, and their role are clearly specified in the IWT. They are usually high-ranking hydro-engineers who have some experience working for government. The commissioners face political pressures and occasionally media outrage for giving technical opinions that contradict popular sentiment in their home countries. In the most extreme case, the commissioner Jamat Ali Shah suffered the wrath of anti-Indian elements in Pakistan who accused him of allowing India to "steal" Pakistan's water by not objecting to India's construction of the Nimoo Bazgo Hydropower Project, which was finished in 2009. Eventually he fled Pakistan and sought asylum in Canada.

So far the IWT has survived three wars and numerous political standoffs, but disputes over water rights and the construction of hydropower installations are intensifying. Pakistan is challenging several Indian hydropower projects, primarily in relation to the technical design of the plants. Islamabad's skepticism regarding India's plans stems from its fear that the projects could reduce or delay the flow of water into Pakistan. Such fears are heightened given that some Indian commentators and politicians have called for New Delhi to use water as a means of punishing Pakistan. The IWT remains a success for now, but its ability to withstand future threats of scarcity, climate change, and geopolitical tensions is in doubt.

Demands on the Ganges

The Ganges is part of one of the largest river systems in the world, the Ganges-Meghna-Brahmaptura basin, which covers an area of 1.7

million square kilometers. The catchment area of the Ganges is divided between India (79 percent), Nepal (14 percent), Bangladesh (4 percent), and China (3 percent). The basin supports the livelihoods of more than 600 million people. With Nepal and China upstream and Bangladesh downstream, India is in the middle (though the bulk of the catchment lies in India itself). While geographically this could be considered advantageous, politically it is complex. Water sharing among countries with varying degrees of dependence on the rivers and major economic and military asymmetries poses major challenges, yet the countries of the basin have reached some agreements over the Ganges and its tributaries.

When India and Bangladesh signed the Ganges Waters Treaty in 1996, it was a culmination of almost three decades of negotiations. Their dispute over water dates back to when Bangladesh was still part of Pakistan. The tension began when India explored the possibility of building the Farakka Barrage; construction started in 1961 and the project was completed in 1975. By diverting water from the Ganges, it allowed India to de-silt the port of Kolkata (then still known as Calcutta) but also threatened to reduce water flow into Bangladesh.

River sharing between neighboring countries is seen as a zero-sum game.

After Bangladesh became independent in 1971, India and Bangladesh set up a Joint River Commission to discuss all their shared rivers. However, the Ganges was specifically excluded from the early discussions. Unlike the Permanent Indus Commission, this panel was neither a dispute-resolution mechanism nor was it bound by any treaty clause. Bangladesh appealed to the United Nations to settle the dispute. A short-term agreement was signed the following year, though it expired after just five years.

The treaty, signed in 1996, has a duration of 30 years. While it is seen as a diplomatic success, the treaty fails to address several critical concerns. The scale, intensity, and uncertainty of the threats arising from climate change and geopolitical shifts could not have been anticipated by the negotiators. Unlike the IWT, the treaty does not even refer to the possibility of "future cooperation." It is an inadequate basis for fostering collective action between the two countries to deal with the impending climate crisis. Water quality is declining and the riverine ecology is being degraded. The flow of water has already diminished as a result of climate change. Finally, the treaty lacks adequate dispute-resolution or arbitration mechanisms.

After the signing of the Ganges treaty, attention turned to another of the shared rivers, the Teesta, but thus far no agreement concerning that river has been signed. Although the two governments came close to an agreement in 2011, it was scuppered by the state government of West Bengal, which argued that the proposed allocation of water to Bangladesh would undermine its own needs.

India's agreements with upstream Nepal differ from those with downstream Bangladesh. Rather than volume-based sharing of river flows, they have focused on potential sharing of benefits from hydro projects, in both irrigation and electricity generation. The Kosi River, a tributary of the Ganges known as the "sorrow of Bihar," is prone to flooding and frequently shifts course, regularly causing loss of property, livelihoods, and even lives. India proposed building the Sapta Kosi High Dam Multipurpose Project after the devastating 2008 floods in Bihar, and said it would bear the full cost of the project. In return, Nepal was to receive royalties from India for the power generated by the project, and both countries would benefit from improved irrigation and flood control. However, they disagreed on the division of the benefits. Nepal felt that India would gain far more from the deal, while India presented itself as a "big brother" helping its smaller neighbor by developing water resources and mitigating flood damage. Several studies warned of the project's environmental impact and the likely scale of human displacement it would cause. These warnings reinforced the political stalemate, given the absence of any mitigation strategy to offset the damage.

China shares water-level data with India and recently extended the period for data sharing as a means of enabling India to control floods. A number of Indian commentators have raised concerns over Chinese dam construction on the Yarlung Tsangpo (the Chinese name for the Brahmaputra), warning that these dams could give China "control" over water flows into India. Few, if any, have suggested that Chinese dams could facilitate flood prevention in India. Some scientific studies have observed that most of the water in the Brahmaputra comes from rainfall downstream from China (although this presumes that the state of Arunachal Pradesh lies within India, which Chi-

na disputes). It seems that concern over Chinese dam-building stems less from its impact on water flows than from alarm over Chinese territorial claims and the fact that a Chinese physical presence is increasingly apparent in parts of Tibet that had for centuries served as a buffer between China and India.

SCARCITY NARRATIVES

Increased demand stemming from population growth and economic development along with the prospect of reduced supply ratchets up the pressure on water resources. According to the Falkenmark water stress index, India is currently under conditions of "water stress" and Pakistan is "water scarce." A country is said to be water scarce when the per capita availability of water is less than 1,000 cubic meters per year. Water-stressed countries have slightly greater water availability per person.

While this index provides a benchmark for the current water situation, it oversimplifies the issue of scarcity, discounting temporal variability and the spatial distribution of water availability. Most of the rivers in the region are perennial and dependent on monsoons. Maximum river flow occurs between June and December. The remaining months experience a lean flow. Furthermore, precipitation is unevenly distributed across the basin. As a result, the average understates the problem of scarcity.

Across South Asia, water management is generally poor: policies allocating water to competing uses—agricultural, industrial, domestic—have been haphazard and primarily beneficial to the agricultural sector. Some sociocultural practices have also restricted marginalized communities' access to water. For instance, in certain rural areas, lower castes are barred from using wells.

The prevailing scarcity narrative focuses on the physical availability of water, ignoring the complexities of distribution. Scarcity is often treated as a technical and managerial problem that justifies building more water-control infrastructure rather than fixing fundamental issues of water usage and consumption. But man-made problems—such as pollution, loss of water in transmission (owing to poor maintenance), wasteful overuse in agriculture, and ill-conceived hydropower and diversion plans—have affected the supply of water as much as natural changes.

There is also a Malthusian security-centered narrative predicting that scarcity will drive conflict. Pakistan fears that India's plans to develop infrastructure on the rivers are intended to give it control over water flowing into Pakistan. These fears are reinforced by occasional statements by some Indian politicians and commentators calling on New Delhi to do exactly that.

Back in 1951, David Lilienthal, a former chairman of the Tennessee River Valley Authority, stoked this anxiety during the early negotiations on the Indus treaty. India's ability to cut off water to Pakistan, he argued, could cause more devastation than any bomb. The security narrative has been prevalent and exaggerated ever since. A veteran Indian journalist, B.G. Verghese, has argued that a fight for control over the headwaters of the Indus is behind the Kashmir dispute.

Many Indian commentators dispute this claim. On average, a hydropower plant takes a minimum of six to eight years to build and costs $2-3 million per megawatt of power production. The cost of technical inputs and production is much higher than the potential benefits from gaining strategic advantage over Pakistan, in the view of these critics.

Meanwhile, an ecology-focused narrative is emerging within civil society and among academics. This view, contesting the assumption that the IWT has been a "success," focuses on the fact that the treaty does not emphasize water conservation or ecological health. As a result, the Indus River is in a dire state. The reduced water flow, owing to diversions, dam construction, inefficient management, and pollution, has adversely affected the riverine ecology. Ecological destruction in the Kashmir Valley, driven by deforestation and overgrazing, has in turn led to river erosion and siltation. Climate change will cause further anxiety over water in the years to come. Yet "water control" infrastructure still dominates river planning and strategies for meeting competing demands.

SHARED INTERESTS

Water shortages due to overuse, poor rainfall, and unilateral diversions by India feed into the scarcity narrative in the Ganges basin. These factors are not given equal weighting in the bilateral negotiations between India and Bangladesh. For Bangladesh, the main concern is upstream diversion by India. At the same time, Bangladesh faces its own challenges with increasing population and demand. While the per capita availability of water is low in both India and Bangladesh, the latter faces increasingly acute issues of siltation and de-

sertification within the basin because of a deficient flow of water. The upstream Indian states of Bihar and Uttar Pradesh, for their part, argue that they have insufficient water for irrigation and domestic consumption. They claim that they have been denied their right to water based on their historic use.

Attempting to divide the river flow by volume has failed to address key problems in transboundary water management. The Ganges treaty mentions water quality and encourages sustainable water use, but little attention has been paid to these issues in practice. Yet rivers are part of a socio-ecological unit that disregards administrative borders and political divisions. Disruptions in water flow affect the entire riverine environment, including fisheries, hydrological cycles, and ecosystems.

The diversion of the river at the Farakka Barrage, poor ecosystem management, and the apparent impact of climate change have adversely affected the Sundarbans, one of the largest deltas in the world. The Ganges joins the Brahmaputra in northern Bangladesh and flows into the Sundarbans and the Bay of Bengal. The Sundarbans is the world's largest continuous block of mangrove forest, rich in natural resources and ecologically sensitive. The area of the delta is split 60:40 between Bangladesh and India. If joint management is out of the question, then at least policy alignment is imperative to maintain these forests and the integrity of the ecosystem, and to mitigate devastating impacts on hydrological cycles, climate, and the flow of the river.

While relations between India and Bangladesh have been strained at times, the two countries are cognizant of these shared interests and have taken some steps to implement water management in the delta. Progress has been slow and cooperation halting given the lack of a long-term agreement and persistent concerns about sovereignty. The political focus has been on facilitating an agreement for the Teesta River rather than deepening engagement in preserving the Sundarbans.

Water disputes between India and Bangladesh are less prone to being framed in terms of national security than those between India and Pakistan. A recent exchange of various enclaves in the India-Bangladesh border region simplified the boundary between the two nations, so there is no outstanding territorial dispute. But security concerns persist over issues such as the use of Bangladeshi territory by northeastern Indian militants. When these conflicts flare up, they have an impact on water relations.

India's main security concern with Bangladesh is migration. No one knows how many Bangladeshis live in India, though 15 to 20 million is a common estimate. Indian fears of Bangladeshi immigration would be best addressed by deepening engagement with Bangladesh on water issues. The impact of ongoing processes of siltation, desertification, and climate change in the years to come will be most devastating for those living in coastal communities and along river banks. Increased water flow into Bangladesh would enable more of its people to maintain their livelihoods without migrating. But the security-driven approach focuses on erecting fences, a policy that clearly is failing to prevent population movements from Bangladesh into India.

BOTTOM-UP COOPERATION

Three dominant narratives shape attitudes toward water in South Asia. The narrative focused on scarcity claims that water is a zero-sum resource, and that in the interest of meeting national development objectives it is imperative for each country to secure as much water as possible. A second narrative places river sharing within the broader ambit of national security, which in turn justifies data secrecy and militarized solutions. And the ecology-based narrative sees a river as an ecosystem demanding joint management by upstream and downstream countries.

Recognizing these divergent perspectives will allow for better policy making. While an ecological perspective is vitally important, it would be idealistic to assume it will have primacy in decision making that is more likely to be driven by security and scarcity narratives. Yet the greater the prominence given to ecological concerns, the more likely it is that solutions will be sustainable.

Official discussions could be supplemented by a bottom-up approach focusing on the ecological approach. There are a few rare cases of successful transboundary water management that demonstrate how the potential for future conflict could be mitigated. A community-to-community early flood-warning system linking India and Nepal is one such example. Since official channels can be slowed by bureaucratic hurdles, a direct line of communication between the upstream and downstream areas is much more effective.

Similarly, both nongovernmental organizations and the governments of India and Bangladesh

share information and exchange ideas on best practices for managing the Sundarbans, including in the areas of water governance, fisheries management, and increasing the adaptive capacity of vulnerable communities. Additional economic and social incentives, such as financial aid, training support, and best-practice awards, are needed to enable these efforts to be scaled up and eventually incorporated into official policy. While joint management may be a step too far, these are some encouraging examples of policy alignment between the two governments.

Decades of cooperation on South Asian waters have come as a by-product of political division and upheaval rather than through the logic of collective action. Persistent conflicts are further heightened by multiple factors including the riparian countries' deficits of economic growth and development, terrorism and nationalist movements, and increasing environmental concerns—above all, the threat of climate change. The old river-sharing agreements may not be able to withstand these looming stresses. They must be supplemented with alternative approaches. ■