RAGING WATERS

China, India, Bangladesh, and Brahmaputra River Politics

NILANTHI SAMARANAYAKE, SATU LIMAYE, AND JOEL WUTHNOW

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FOREWORD

Throughout my career as an academic and government analyst I was drawn to complex challenges: first, as a "multidisciplinary" PhD studying at the crossroads between international relations, geography, and history; second, as an academic working in a military environment; and last, as a researcher interested in environmental security, and more specifically, water scarcity.

Water scarcity is a difficult but important subject to address. My lectures on the topic usually begin with a complex diagram mapping the large number of issue areas that illustrates how vitally important water is to every facet of human existence. However, another message becomes apparent to students: water scarcity is an expansive topic and therefore theoretically problematic. From the start complications arise due to the pervasive nature of water. Water underwrites human life, so how can we begin to discuss it in isolation from other variables? Does water scarcity cause conflict or does conflict cause water scarcity? Is water scarcity due to a lack of availability or to ineffective allocation? Are the problems solved by building more infrastructure or does the spread of infrastructure lead to more water exploitation? Unfortunately, the best answer to most of these questions is: "it depends." Water scarcity is subject to a wide variation of conditions, depending on the uniqueness of each geographical area.

Case studies, such as those used in *Raging Waters: China, India, Bangladesh, and Brahmaputra River Politics,* are vitally important to understanding the broader impacts across a basin, but the ubiquitous nature of water confounds research efforts. What level of analysis is appropriate to study a river system? One possibility is to analyze subnational dynamics, which are

helpful to understand specific impacts of water scarcity that may lead to internal displacement, violence, and economic hardships. Another option is to consider state-level impact—these help explain national policies, relations with neighboring rivals, and the potential for regional conflict over water resources. Neither of these levels of analysis used in isolation can provide a holistic picture of a complete river. This book takes a methodological approach that accounts for all levels of analysis.

This volume fills an important niche in the literature. The Tibetan Plateau is known as the water cooler for Asia and forms the headwaters for many major river systems, such as the Yangtze, Yellow, Ganges, Indus, and Brahmaputra among others. Most of these rivers are well studied except for the Brahmaputra. This is in part because the Brahmaputra is frequently discussed in combination with two other rivers, the Ganges and the Meghna Rivers. Together they combine to form the Ganges-Brahmaputra-Meghna (GBM) river basin. There is a need to address the Brahmaputra due to China's upstream development activity, which amounts to less water for India and Bangladesh, and because the Brahmaputra lacks a bilateral or multilateral agreement. The authors use original research that serves to increase the relevance of the book. Many authors tend to avoid the detailed layers associated with the domestic level of analysis and thus the potential problems associated with it. Domestic sources can be difficult to research for a variety of reasons, including their availability and the inability to generate accurate translations. The authors put forth a great deal of effort to include original sources from the region that are interspersed with interviews. These provide a rich baseline to understand the multiple causes of water scarcity in the region and highlight the interstate dilemmas over water-sharing agreements.

The contribution of this book is considerable, not only to the student of water scarcity but also to a regionalist who constantly seeks to understand the complex interactions of economic, political, social, and environmental factors that influence security. Equitable water distribution of the Brahmaputra River plays an important role in Chinese, Indian, and Bangladeshi relations. China's strategy is to develop the remote areas around the river

through damming projects, which will provide energy and water for agriculture. This strategy is no different than Turkey's well-known Southeastern Anatolia Project (GAP), or the U.S. development of the Colorado River beginning in the 1930s. Such massive development will result in less water for the middle riparian (India) and lowest riparian (Bangladesh). All three states are considered water scarce, so can they forge an agreement regarding the Brahmaputra? The authors explain that there is no bilateral or multilateral accord in place and that the obstacles to such an agreement are due to domestic politics, national objectives, and regional dynamics. In short, *Raging Waters: China, India, Bangladesh, and Brahmaputra River Politics* helps to reduce the level of complexity surrounding the topic of water politics, and it sheds light on an under-researched but increasingly important area of Asia.

Matthew R. Slater

PREFACE

The availability of water resources provided by the Brahmaputra River, which originates in China and runs through India and Bangladesh, raises serious concerns for regional stability. China and India are actively constructing dams and considering water diversion plans, while Bangladesh faces human security pressures that will be magnified by upstream river practices. A pioneering 2012 Intelligence Community Assessment by the U.S. Office of the Director of National Intelligence, entitled *Global Water Security*, identified the Brahmaputra basin as having "inadequate" river basin management capacity. Of the seven river basins studied—Nile, Tigris-Euphrates, Mekong, Jordan, Indus, Brahmaputra, and Amu Darya—the Brahmaputra ranked lowest in river basin management capacity. The report forecasted that the basin will see ongoing discord among riparian nations concerning river development projects through 2040, as well as reduced food security and hydropower potential.[1]

Unlike the Indus or Ganges Rivers, there is no bilateral or multilateral accord for water management of the Brahmaputra River. Current cooperation in this basin only entails some dialogue and limited sharing of hydrological data for the purpose of flood forecasting. Moreover, the basin is home to three of the most populous nations in the world—two of which (China and India) fought a war in 1962 over still-contested territory through which the Brahmaputra flows. In fact, a troop standoff between India and China over the territory claimed by Bhutan and China appears to

[1] *Global Water Security* (Washington, DC: Office of the Director of National Intelligence, 2012).

have resulted in Beijing halting hydrological data sharing with New Delhi in the summer of 2017.[2] Meanwhile, Bangladesh and northeast India continue to experience severe flooding and damage in the Brahmaputra basin. Both events illustrate the ongoing potential for political-military instability and human security crises in this region regarding water resources.

This book aims to provide greater understanding of the equities and drivers fueling water insecurity and resource competition in the Brahmaputra River basin. Further, it contributes to the burgeoning field of Asian water security analysis with the study of a river basin that has received little scholarly attention compared with the Indus and Ganges Rivers, integrating the study of water issues with the difficult international and subnational relations of the Brahmaputra basin region. To this end, we consider the following research questions.

LEVELS OF ANALYSIS FOR UNDERSTANDING BRAHMAPUTRA SECURITY AND STAKEHOLDERS

What are the security implications of water resource competition in the Brahmaputra River basin? How do they vary at the subnational level (i.e., domestic), the bilateral level (i.e., India-Bangladesh, India-China, Bangladesh-China), and the basin-wide level (i.e., multilateral)?

POSSIBLE SOLUTIONS FOR BRAHMAPUTRA STAKEHOLDERS

What policies and foundational work could stakeholders pursue to mitigate water insecurity and advance their cooperation in the Brahmaputra River basin? How can policy makers in Bangladesh, India, and China address the lack of basin-wide management in the Brahmaputra to avoid future political-military and human security crises?

Drawing on original research conducted in India, China, and Bangladesh, we offer recommendations for key stakeholders to consider at the

[2] Joel Wuthnow, "Did China Use Water as a Weapon in the Doklam Standoff?," *War on the Rocks* (blog), 4 October 2017.

subnational, bilateral, and basin-wide levels. We hope to lay the foundation for policy makers in the three capitals to take steps to manage water resource competition. They can then focus on shared interests and solutions that address underlying long-term water needs and economic development of the Brahmaputra basin, thereby strengthening regional security.

ACKNOWLEDGMENTS

The authors are grateful to the John D. and Catherine T. MacArthur Foundation, which sponsored the CNA study upon which this book is based. The 2016 study is entitled *Water Resource Competition in the Brahmaputra River Basin: China, India, and Bangladesh* by Nilanthi Samaranayake, Satu Limaye, and Joel Wuthnow.

We are grateful to our think tank partners in the region—the Bangladesh Enterprise Institute (BEI) in Dhaka, the Center for Policy Research (CPR) in New Delhi, and the China Institutes of Contemporary International Relations (CICIR) in Beijing—for their willingness to support our field research and for hosting round table discussions. We are also grateful to the experts we consulted who kindly took the time to answer our many questions.

INTRODUCTION

Events in the past decade—and especially during the past year—highlight the need for policy makers and scholars of Asia and water security to pay more attention to the stability of the Brahmaputra River basin. Originating in China, and flowing through India and Bangladesh, the river runs through three of the most populated countries in the world.[1] China and India are major geopolitical players and fought a war in 1962 over territory that they still dispute and through which the Brahmaputra runs. In the summer of 2017, military forces of both countries engaged in a lengthy standoff due to a border dispute involving a third country—Bhutan. While the standoff was not directly tied to Brahmaputra basin resources, the conflict resulted in Beijing halting data sharing to New Delhi for flood forecasting purposes. This is an important cooperative measure, considering no water management agreement has been achieved in the basin.

Furthermore, China's attempt in September 2016 to block a tributary of the Brahmaputra in Tibet for hydroelectric dam construction alerted policy makers and experts in both India and Bangladesh to the potential for Beijing to wield undue influence on the two downstream riparian nations.[2] Meanwhile, Bangladesh faced another bout of severe flooding in the summer of 2017, thereby highlighting the ongoing pressures faced by the country due to this river, which is also at the mercy of activities by the two

[1] Bhutan is the fourth country in the basin, although it is not considered a riparian nation because the Brahmaputra does not directly flow through it.

[2] Satu Limaye, Joel Wuthnow, and Nilanthi Samaranayake, "China and India's Slow-Moving Path to 'Water Wars'," *National Interest*, 1 November 2016.

upper riparian countries, India and China. Flooding also took place on the Teesta River, a tributary of the Brahmaputra that enters Bangladesh from India and for which New Delhi still has not concluded a water-sharing agreement sought by Dhaka.

Even prior to 2018, voices from both China and India have increasingly stirred discussion for the last decade about the potential for conflict and the threats to human security as a result of water resource competition in the Brahmaputra basin. Most prominent has been Indian author Brahma Chellaney, whose 2011 book, *Water: Asia's New Battleground*, raised alarms about China's dam-building efforts on the Brahmaputra.[3] Chellaney's analysis was, in part, inspired by the controversy over a People's Liberation Army (PLA) officer's 2005 book, *Xizang Zhi Shui Jiu Zhongguo* (Tibet's Waters Will Save China).[4] Li Ling argues that upper riparian China should divert the Brahmaputra for internal use, despite the consequences for lower riparian states India and Bangladesh. Meanwhile, Bangladesh, as the lowest riparian, has long been concerned about activities by its northern neighbors that negatively affect its citizens and resources. Interestingly, India is both a lower riparian in this basin with accompanying threat perceptions—similar to Bangladesh—and an upper riparian—similar to China.

Regarding the scope of the book, we are focusing on the Brahmaputra River basin, rather than addressing the wider GBM basin. Observers have often included the Brahmaputra as part of the wider GBM basin in their definition. This may reflect the fact that water security studies have focused on the Ganges as the primary unit of analysis and few have concentrated on the Brahmaputra itself. However, the Brahmaputra riparian countries entail arguably greater political-military and human security threats, given the sizable populations and complex historical and contemporary relations between China, India, and

[3] Brahma Chellaney, *Water: Asia's New Battleground* (Washington, DC: Georgetown University Press, 2013). The Brahmaputra is known as the Yarlung Tsangpo in Tibet, the Jamuna in Bangladesh, and the Siang in parts of India. For consistency, this book uses the term *Brahmaputra* to identify the river throughout the basin.

[4] Li Ling, *Xizang Zhi Shui Jiu Zhongguo* [Tibet's Waters Will Save China] (Taiwan: Huawen Press, 2005).

Bangladesh. We also think there is legitimacy in keeping the focus on the Brahmaputra because a greater number of potential stakeholders could be involved if we used a GBM definition. Consequently, it would be very difficult to bring them all together to find solutions. For example, the United Nations Food and Agriculture Organization (FAO) writes: "In planning and management terms, it is simply impossible to consider the GBM river system as one system because of its sheer size, complexities and multinational character."[5] Furthermore, the World Bank's South Asia Water Initiative (SAWI) subdivides its South Asia project work, and one of its components is a separate Brahmaputra initiative.[6] Therefore, we feel that it is more manageable to examine the subject at this level and that it is consistent with the view of expert institutions.

A second issue of analytical scope involves the case of Bhutan. The region known as the "Third Pole" divides its water resources between several countries.[7] The Brahmaputra basin encompasses not only China, India, and Bangladesh but also Bhutan. While Bhutan has interests in the welfare of the Brahmaputra basin, we are not studying the country as part of this book due to reasons of geography, population size, and political-military independence and standing. First, the Brahmaputra does not directly traverse territory in Bhutan as it does through Bangladesh, India, and China. While technically in the Brahmaputra basin, the country is not a riparian nation. Second, China, India, and Bangladesh represent 3 of the 10 most populous nations in the world. Their current and potential threats affect millions of citizens and have broader security implications. Bhutan has a population of about 750,000, compared with roughly 170 million

[5] "Transboundary Water Issues," in *Irrigation in Southern and Eastern Asia in Figures*: *AQUASTAT Survey—2011*, ed. Karen Frenken (Rome: FAO, 2012), 123.

[6] "Brahmaputra Focus Area Strategy," South Asia Water Initiative, http://www.worldbank.org/en/programs/sawi#4

[7] "About: What Is the Third Pole?," TheThirdPole.net. The term *Third Pole* refers to "the region that encompasses the Himalaya-Hindu Kush mountain range and the Tibetan Plateau [and] is widely known as the Third Pole because its ice fields contain the largest reserve of fresh water outside the polar regions."

Adapted by Pete McPhail, based on data from "Ganges-Brahmaputra-Meghna River Basin," in *Irrigation in Southern and Eastern Asia in Figures, AQUASTAT Survey—2011*

Map 0.1. The Indus, Ganges, Brahmaputra, and Meghna basins.

in Bangladesh, 1.2 billion in India, and 1.3 billion in China.[8] As a result, Bhutan carries with it comparatively less threat potential than the risk factors that we assess from the three major countries in the basin. Finally, Bhutan is not the geopolitical player that the other three basin countries are. Though Bhutan is a sovereign country, it has largely been under India's sphere of influence and heavily reliant on New Delhi for military

[8] "Country Comparison: Population," in *The World Factbook* (Washington, DC: Central Intelligence Agency, 2015).

protection.[9] As a result of these three factors, we assigned equal analytical weight (and project resources) to field research in China, India, and Bangladesh; as such, we determined that Bhutan did not warrant the same level of attention.

We hope that readers will find this book useful primarily for three reasons. First, it contributes to the burgeoning field of Asian water security analysis with a study of a river basin that has received little scholarly attention. A reader may wonder why this book focuses on the Brahmaputra River when, at least in South Asia, the Indus and Ganges basins have dominated the current study of river systems. For the Indus, the India-Pakistan conflict has elevated the importance of understanding the full spectrum of threats in the region, including water insecurity. The Ganges basin also has been a critical area of importance, given the hundreds of millions of people who depend on that river (see map 0.1).

By contrast, the Brahmaputra basin has been comparatively underexamined, despite the complex geopolitics involved and potential threats to regional stability. Covering an expanse of 580,000 square kilometers across four countries, the Brahmaputra basin comprises China, India, Bangladesh, and Bhutan, which, according to the World Bank, occupy 50 percent, 34 percent, 8 percent, and 8 percent of the basin, respectively.[10] The river is the fifth largest in the world by flow, yet there is no water-sharing agreement or management accord in the basin.[11] Minimal information sharing about water flows has taken place between the countries for flood-prevention purposes only. As a frame of reference, basin agreements have been achieved on other important transboundary rivers, such as the Nile

[9] Teresita C. Schaffer, "India Next Door, China Over the Horizon: The View from South Asia," in *Strategic Asia 2011–12: Asia Responds to Its Rising Powers—China and India*, ed. Ashley Tellis, Travis Tanner, and Jessica Keough (Seattle, WA: National Bureau of Asian Research, 2011), 307.

[10] "Brahmaputra Focus Area Strategy," South Asia Water Initiative, http://www.worldbank.org/en/programs/sawi#4. For a similar estimate, see "Ganges-Brahmaputra-Meghna River Basin," in *Irrigation in Southern and Eastern Asia in Figures*, 111.

[11] Patrick A. Ray et al., "Room for Improvement: Hydroclimatic Challenges to Poverty-reducing Development of the Brahmaputra River Basin," *Environmental Science & Policy*, no. 54 (December 2015): 64, https://doi.org/10.1016/j.envsci.2015.06.015.

Adapted by Pete McPhail, based on data from Demis Web Map Server

Map 0.2. The Brahmaputra River.

Basin Initiative, the Amazon Cooperation Treaty Organization, and the International Commission for the Protection of the Danube River.[12] Moreover, the river is a coveted source of water for 130 million people, serves a variety of purposes such as agriculture, fisheries, and navigation, and it is a potential

[12] *Himalayan Solutions: Co-operation and Security in River Basins* (Mumbai, India: Strategic Foresight Group, 2011), 28–29.

source of much-needed hydroelectric power to fuel growing economies in the region. Given the river's importance and the fact its major stakeholders have not yet achieved a basin-wide agreement regarding the river's management, the Brahmaputra warrants greater analytical attention (see map 0.2).

Second, the book's particular contributions include integrating the study of a diverse set of issues related to water, international relations, and subnational politics in the Brahmaputra basin—subjects that are not often analyzed together. In recent years, interest in Brahmaputra security among journalists and academics has largely emerged due to a focus on the bilateral or national implications of problems in the basin. Important foundational research regarding this basin has focused on various subcomponents of Brahmaputra security.[13] This includes India-China security dynamics regarding their dam-building activities; India-Bangladesh discord over water sharing of the Teesta River, a tributary of the Brahmaputra; and water security within Bangladesh.[14] At the other end of the spectrum, there have been several studies of water security in Asia broadly, but based on the reality that many of Asia's major rivers systems originate in China.

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[13] Important foundational research, conducted in South Asian countries as well as in Europe, covers aspects of the wider Brahmaputra River basin. Products include a study of perceptions about water security in South Asia by Chatham House, in partnership with Bangladesh Enterprise Institute (BEI), Observer Research Foundation (ORF) in India, and other regional institutions. See Gareth Price et al., *Attitudes to Water in South Asia* (London: Chatham House, 2014). The Strategic Foresight Group (SFG) in Mumbai conducted a comprehensive study about potential outcomes for Himalayan water security, such as desertification, food insecurity, pollution, and dam diversions. See *The Himalayan Challenge: Water Security in Emerging Asia* (Mumbai: Strategic Foresight Group, 2010). A study by Norway's Peace Research Institute Oslo (PRIO) analyzed water scarcity in Bangladesh and considered the potential for multilateral cooperation mechanisms. See Åshild Kolås et al., *Water Scarcity in Bangladesh: Transboundary Rivers, Conflict and Cooperation* (Oslo: Peace Research Institute Oslo, 2013).

[14] For India-China analysis, see Zhang Hongzhou, "China-India: Revisiting the 'Water Wars' Narrative," *Diplomat*, 30 June 2015; Li Zhifei, "ZhongYin lingtu zhengduan zhong de shui ziyuan anquan wenti" [Water Security Issues in Sino-Indian Territorial Disputes], *Nanya Yanjiu Jikan* [South Asian Studies Quarterly], no. 4 (2013): 29–34; and *Water Security for India: The External Dynamics* (New Delhi: Institute for Defence Studies and Analyses, 2010). For India-Bangladesh analysis, see Sagar Prasai and Mandakini D. Surie, *Political Economy Analysis of the Teesta River Basin* (New Delhi: Asia Foundation, 2013); and *Rivers of Peace: Restructuring India Bangladesh Relations* (Mumbai: Strategic Foresight Group, 2013). For Bangladesh, see Ayreen Khan, "Water Security: The Threat Facing Bangladesh," *BIPSS Issue Brief*, February 2007.

Building on these efforts, we examine the universe of Brahmaputra stakeholders and study them cohesively. Specifically, we will focus on three sets of stakeholders. First, we will address the national stakeholders in each capital who interact *bilaterally* with their counterparts in New Delhi, Dhaka, and Beijing. In addition to these high-level parties, farmers and local officials also played a role. Second, we delve into the interests of the various *subnational* stakeholders of the region, sometimes at odds with the leaders in their national capitals. These people live in such places as Arunachal Pradesh, Assam, and West Bengal in India; Tibet in China; and Rangpur, Mymensingh, and Rajshahi in Bangladesh. Third, we investigate the possibility of *multilateral* activities and agreements that would serve the various stakeholders across the Brahmaputra basin. By adopting this approach and aforementioned scope, *Raging Waters: China, India, Bangladesh and Brahmaputra River Politics* fills a gap in the literature by transcending the analytical limits of state-centric or multibasin paradigms through attention to the Brahmaputra at the *basin-wide* (i.e., beyond solely bilateral relations) level and at the *subnational* (i.e., domestic) level, in addition to the bilateral level, all in one assessment.

Third, the book aims to provide a common platform for interested parties—policy makers without training in hydrology and scientists without a background in the study of international relations—to consider the water challenges faced by Bangladesh, India, and China along the entire Brahmaputra against the backdrop of their bilateral relations. We hope this book will inform policy communities in China, India, and Bangladesh—as well as water resource specialists and academics internationally—about the interconnected aspects of the political-military situation in the Brahmaputra River basin and the potential for national water, energy, and infrastructure policies that could exacerbate interstate tensions and subnational human security conditions in the region.

To provide practical benefit after this comprehensive consideration, we present policy options for promoting water security and stability in the Brahmaputra region. These recommendations aim to expand dialogue that leads to greater coordination and future institution building—ideally,

the development of bilateral or multilateral water-sharing treaties for the Brahmaputra River. Given the potential threats to stability in the region if China, India, and Bangladesh continue ignoring the situation, this research lays a foundation for policy makers in all three countries to discuss steps toward a regional solution for long-term water needs in the Brahmaputra basin. Such an understanding will help strengthen overall security and the relationships between the riparian neighbors.

Readers of this book will benefit from insights shared during semi-structured discussions CNA conducted in the three countries being studied. During a span of two months, we met with a wide range of subject matter experts who spoke candidly about the challenges (both physical and political) they see in the Brahmaputra basin. Consequently, we aim to protect the identity of the individuals who kindly shared their knowledge. To this end, we limit information about them in our footnotes, only showing the location of the discussion.

Raging Waters analyzes the three major countries of the Brahmaputra River basin: China, India, and Bangladesh. Each chapter looks at the issues facing the country at the domestic, bilateral, and basin-wide levels. The structure is parallel across the chapters for ease of reading. The first chapter, "Water Power, Water Worries: China's Goals and Challenges as the Brahmaputra's Uppermost Riparian," by Joel Wuthnow, draws on Chinese-language sources and field research to understand, from China's perspective, the subnational issues involved as well as the bilateral relationships with India and Bangladesh over security in the Brahmaputra basin. Through this comprehensive analysis, the chapter concludes that while China has shown little willingness to address Brahmaputra issues at a multilateral level, opportunities may exist for China to modestly expand cooperation at both a bilateral and multilateral level.

In chapter 2, "Upstream, Downstream: Reflections on India's Riparian Relationships on the Brahmaputra," Satu Limaye examines this middle riparian nation's unique quandaries, seeing itself as a victim of China's water activities, yet seeking to maximize national water resources in a way that does not sufficiently consider or mitigate harmful impacts on its

downstream neighbor, Bangladesh. In addition, the subnational element of water security also is unique regarding center-state relations between New Delhi and India's northeast. Drawing on numerous in-country interviews with experts and other sources, this chapter concludes that multilateral cooperation on the Brahmaputra River does not elicit much support from India at present and is not likely to do so for the foreseeable future.

Chapter 3, "Bangladesh: The Strongest Advocate of Basin-Wide Management," by Nilanthi Samaranayake, finds that Dhaka has the most incentive and space to pursue bilateral and multilateral cooperative approaches with New Delhi and Beijing for the development and management of the Brahmaputra basin. While the country is most at risk from the cumulative impacts of India's and China's self-interested river management, analysis of in-country interviews with experts and officials reveal that Bangladesh's most immediate threats stem from internal challenges.

The appendix concludes with recommendations for how the countries can work together as well as improve their national policies so they can foster greater water security in the basin. We include recommendations for how the international community (i.e., international financial institutions and extraregional countries, such as the United Kingdom, United States, etc.) can lend assistance, which helps advance Brahmaputra River basin security.

This book represents a first attempt to examine the Brahmaputra River basin and its major country stakeholders as the core subject of analysis. Using a three-tiered framework—subnational, bilateral, and multilateral—we sought to connect the dots of previous analyses that have studied segments of Brahmaputra basin security. However, this topic would benefit from greater study in two respects. First, this project did not seek to conduct a scientific study of water availability or climate change impacts in the Brahmaputra basin. Hydrological studies have been conducted on the Brahmaputra, although they are arguably too few and are not focused on the Brahmaputra River but entail the wider GBM basin definition. Notably, a foundational scientific study of the entire Brahmaputra basin was conducted by a team of researchers led by Patrick A. Ray and funded by the

World Bank in 2015.[15] As the authors of this book, we are not hydrological scientists but rather study political-military security issues. Throughout the process of conducting research, we found how important it was to be able to unify both physical and political analysis, and we communicate these findings to policy makers who make decisions that affect the long-term security of the Brahmaputra River basin. As a result, we hope future research on the Brahmaputra River basin produces technical water assessments made by hydrological experts.

Second, our project resources enabled field research conducted in the national capitals of the three countries being studied. For future work, we hope researchers will be able to conduct field research with local experts (e.g., farmers, officials, and protestors) based in the subnational locations in all of the three countries where the Brahmaputra travels. These locations include the Indian state of Arunachal Pradesh, the Chinese autonomous region of Tibet, and the Bangladeshi division of Rangpur.

Greater scientific study and projections about the health of the Brahmaputra, especially regarding potential dam-building activities and water diversion plans, combined with interviews of local stakeholders in each of the three countries, will enhance understanding of the equities and challenges over Brahmaputra resources and the possibilities for greater cooperation across the basin.

[15] For the most recent hydrological analysis that is specific to the Brahmaputra and spans the entire basin, see Ray et al., "Room for Improvement," 64–80.

CHAPTER 1

WATER POWER, WATER WORRIES: CHINA'S GOALS AND CHALLENGES AS THE BRAHMAPUTRA'S UPPERMOST RIPARIAN

JOEL WUTHNOW

In September 2016, China announced that it would temporarily divert the Xiabuqu, a tributary of the Brahmaputra located on the Tibetan Plateau, to begin the construction of two major hydroelectric dams. The purpose of the dams, according to Chinese state media, was to increase electricity production and to contribute to a rising standard of living in the Tibet Autonomous Region, one of China's 34 provincial-level administrative units and one of its most impoverished. The announcement, however, immediately sparked concerns among Indian analysts who suspected Beijing of harboring ulterior geopolitical motives and asserted that the diversion could have negative environmental consequences, including reducing the flow of water into India. China responded by reaffirming its benign intentions and denying that the diversion would result in a significant loss of water for its downstream neighbor.[1]

The episode was a microcosm of the larger dilemma China faces with the Brahmaputra. On the one hand, the river offers potential hydropower resources that can provide electricity for Tibet and its neighboring provinces. Building hydroelectric dams along the river also plays a role in Beijing's broader efforts to develop clean energy resources. China has already built one hydroelectric dam on the Brahmaputra and plans to construct several more. On the other hand, the Brahmaputra also has created two types of challenges for Sino-Indian relations. First, Beijing has had to reassure New

[1] For details, see Limaye, Wuthnow, and Samaranayake, "China and India's Slow-Moving Path to 'Water Wars'."

Delhi that its dam-building activities are nonthreatening, responding to concerns by some in India that China could use these facilities to disrupt the flow of water in a future Sino-Indian conflict. Second, China is concerned that Indian dam-building activities downstream could firm up New Delhi's "actual control" over Arunachal Pradesh, or what China regards as "southern Tibet." This could complicate border negotiations and further reduce Beijing's hopes of recovering this territory.

China has focused its diplomatic efforts related to the Brahmaputra at a bilateral level, including signing agreements to provide India with river flow data during the flood season. Yet, due to the border dispute and compounded by mutual distrust in Sino-Indian relations, cooperation between the two sides has been limited. Meanwhile, China has shown little willingness to address Brahmaputra issues at a multilateral level, involving both India and Bangladesh. Nevertheless, there may be opportunities for China to modestly expand cooperation at both a bilateral and multilateral level. Specific actions could include expanded hydrological data sharing and environmental cooperation between Beijing and New Delhi and a nonofficial dialogue on shared river challenges involving all three riparians.

CHINA'S DOMESTIC USES OF THE BRAHMAPUTRA

As of 2018, China's development activities on the Brahmaputra are limited to a series of planned hydroelectric dams, which are being built primarily to raise the standard of living in Tibet but also will support the Chinese government's broader emphasis on clean energy. By contrast, China has announced no plans to attempt to divert the course of the river to satisfy domestic demands, although there are those who advocate for just such a plan. While diversion plans have been discussed intermittently in China for decades, serious cost and feasibility issues make their implementation unlikely.

In the last 20 years, China has devoted significant effort to improving water resources in western China. Spearheaded by China's Ministry of Water Resources, this investment has led to improved access to safe drinking water for 2.39 million people and has brought electricity to some

360,000 Tibetan herdsmen, according to People's Republic of China (PRC) data. This effort has included a total of $4.87 billion spent on water resource infrastructure in Tibet through 2014. Moreover, China's five-year economic plan for 2011–15 places the main emphasis for water resource development in China on the southwestern Mekong region and on the Tibetan Plateau, with a focus on building new water pumping and power storage facilities.[2]

Chinese sources frequently argue that the purpose of hydroelectric dam construction in Tibet is to develop an underutilized resource to meet local energy needs. A state media report noted, for example, that Tibet's per capita electricity consumption in 2014 was less than one-third of the national average, yet the region possesses a full 30 percent of the nation's water resources, capable of producing more than 200 million kilowatt hours of electricity.[3] According to Chinese economist Liu Peng, the Brahmaputra has the lowest hydropower utilization rate of all of China's large rivers but also has the greatest potential for development. Liu argues that seizing this opportunity would help meet Tibet's energy needs.[4] Likewise, at the opening ceremony of the Zangmu Dam in the Tibet Autonomous Region, an official from the state electric grid boasted that the new dam would help "solve Tibet's power shortage, especially in winter."[5]

Hydropower development in Tibet is part of a broader effort to economically develop western China. A key element of this effort is the campaign to *xibu da kaifa* (open up the west), which was launched in 2000 to encourage economic progress in that historically impoverished part of the country. The program also was likely meant to support the migration of ethnic majority Han citizens into minority-dominated areas, such as Tibet

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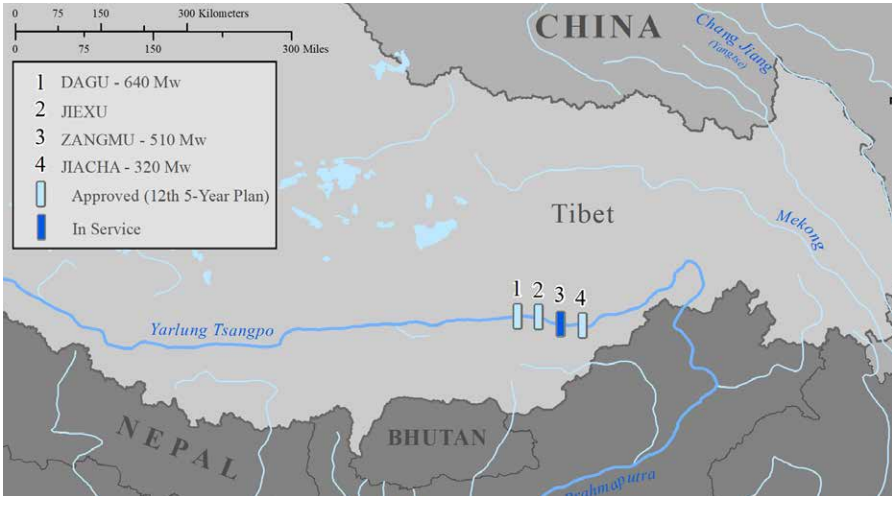
[2] "China Invests 30 Billion Yuan on Tibet Water Infrastructure," *Xinhua*, 23 August 2014; and "The Outline of the 12th Five-Year Program for National Economic and Social Development of the People's Republic of China," *Xinhua*, 16 March 2011.

[3] "China Invests 30 Billion Yuan on Tibet Water Infrastructure."

[4] Liu Peng, "ZhongYin zai kuajie heliu shang de liyi: suqiu yu xianghu yilai" [Chinese and Indian Interests in Transboundary Rivers: Demands and Interdependence], *Nanya Yanjiu* [South Asian Studies], no. 4 (2013): 33–45.

[5] "China Focus: Major Hydroplant Begins Operations in Power Thirsty Tibet," *Xinhua*, 24 November 2014.



Adapted by Pete McPhail, based on data from Ananth Krishnan, "China Gives Go-ahead for Three New Brahmaputra Dams," *Hindu*, 30 January 2013

Map 1.1. China's current and planned dams on the Yarlung/Brahmaputra.

and Xinjiang, and to develop natural resources and minerals in these areas to facilitate national economic growth.[6]

Aside from economic advantages, China's drive to develop hydropower resources in Tibet supports a national emphasis on clean energy development. China's national energy policy states that more than half of the contributions to the goal of raising non-fossil fuel energy consumption to 15 percent by 2020 will come from hydropower.[7] To meet this goal, the plan mandates that China accelerate construction of hydropower stations on key rivers, such as the Brahmaputra. Similarly, a State Council official has

[6] For an introduction to the program, see David S. G. Goodman, "The Campaign to 'Open Up the West': National, Provincial, and Local-Level Perspectives," *China Quarterly* 178 (2004): 317–34; Elizabeth C. Economy, "Asia's Water Security Crisis: China, India, and the United States," in *Strategic Asia 2008–09: Challenges and Choices*, ed. Ashley J. Tellis, Mercy Kuo, and Andrew Marble (Seattle, WA: National Bureau of Asian Research, 2008); and "Who Is Chinese? The Upper Han," *Economist*, 19 November 2016.

[7] *China's Energy Policy 2012* (Beijing: Information Office of the State Council, 2012).

stated that a main reason for increased dam building in Tibet is that these facilities will help reduce carbon emissions by providing clean energy.[8]

To achieve these goals—stated or unstated—China is making gradual progress and has announced plans to construct four dams along the Brahmaputra in Tibet. Only one of these facilities is currently operational—the Zangmu Dam, which is situated in Gyaca County, roughly 100 miles southeast of Lhasa. The Zangmu Dam opened in November 2014, and it became fully operational in October 2015. The dam has a total installed capacity of 510,000 kilowatt hours, raising Tibet's overall power generation capacity by roughly 25 percent. According to China's state energy plan for 2011–15, there are also plans to construct hydroelectric dams along the river at the nearby towns of Jiacha, Jiexu, and Dagu (see map 1.1).[9]

A more controversial use of the Brahmaputra lies in the possibility, despite no announced plans, that China may seek to divert the river to meet domestic needs, especially for irrigation. China currently faces serious water-scarcity challenges at a national level. Overall, China holds 20 percent of the world's population but only 7 percent of its fresh water resources. Moreover, China's limited water resources are unevenly distributed: northern China possesses only an estimated 14 percent of the country's fresh water but 60 percent of its farmland and 45 percent of its total population. In addition, 70 percent of northern Chinese villages have been described as short of water, with the per capita water endowment of some areas less than one-tenth of the world average. This situation has been ex-

[8] *China's Energy Policy 2012*; and "Hydro-Power Dam Stirs Debate," *Global Times*, 18 November 2010.

[9] "China Focus: Major Hydroplant Begins Operations in Power Thirsty Tibet"; and *12th Five Year Plan Energy Development Plan* (Beijing: Information Office of the State Council, 2013). In addition, Chinese engineers have explored the possibility of constructing a massive 38-gigawatt hydroelectric dam farther downstream at Motuo, but this has not been officially endorsed and does not appear in the 12th five-year energy plan. For details, see Jonathan Watts, "Chinese Engineers Propose World's Biggest Hydro-electric Project in Tibet," *Guardian*, 24 May 2013.

Adapted by Pete McPhail, based on data from Wang Yizhi, "China's South–North Water Diversion Project," China Central Television, 18 September 2012

Map 1.2. Current and planned routes of the South–North Water Diversion Project.

acerbated by such factors as weak pollution controls, poor conservation efforts, and inefficient irrigation methods.[10]

To correct these imbalances, China has embarked on a massive water transfer project known as the *Nanshui Beidiao Gongcheng* (South–North Water Diversion Project). Begun in 2002, the project consists of three planned routes: the eastern, central, and western. The eastern and central routes focus on diverting water from southern China's Yangtze and Han Rivers, respectively, to the Yellow River in the north. These two routes have already been completed and are currently supplying water to northern

[10] Zhang Hongzhou, "Confronting China's Water Insecurity," *RSIS Commentary*, 30 April 2014; Sebastian Biba, "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, no. 85 (2014): 21–43, https://doi.org/10.10801/10670564.2013.809975; Peter MacKenzie and Marcus King, *Climate Change in China: Socioeconomic and Security Implications* (Arlington, VA: CNA, 2010), 3; and Kenneth Pomeranz, "Asia's Unstable Water Tower: The Politics, Economics, and Ecology of Himalayan Water Projects," *Asia Policy,* no. 16 (July 2013): 5.

cities, such as Beijing and Tianjin. According to China's official plans, the western route, still in its early planning stages, will concentrate on diverting the headwaters of three tributaries of the Yangtze (the Tongtian, Yalong, and Dadu Rivers, which are all domestic rivers on the Tibetan Plateau) to the Yellow River by 2050 (see map 1.2).[11]

During the past three decades, various Chinese scholars have proposed diverting the Brahmaputra as a remedy above and beyond the official South–North Water Diversion Project. The best-known plan, put forward by a senior researcher at the Yellow River Water Conservancy Commission in 1990, envisions diverting the river via a series of canals and dams through Sichuan Province and into the Yellow River. Other plans have been proposed and studied by scholars at the Chinese Academy of Sciences, the Changjiang (Yangtze River) Water Resources Commission, and elsewhere. One plan, offered by a former Chinese PLA officer, gained significant attention within China and internationally. Notions of diverting Tibetan rivers to alleviate the water needs of northern China entered the Chinese popular imagination with the publication of the book *Xizang Zhi Shui Jiu Zhongguo* (Tibet's Waters Will Save China) by officer Li Ling in 2005. Li argues that waters from four rivers, including the Brahmaputra, could be diverted to the Yellow River. Li's ideas have gained international attention—Indian scholar Brahma Chellaney cites it as evidence that China harbors plans to divert the river despite official assurances that it has no such plans.[12] Other Chinese scholars, though, pan the book as "bravado" and "folk theory."[13]

[11] For more details, see Susan Chan Shifflett et al., *China's Water-Energy-Food Roadmap: A Global Choke Point Report* (Washington, DC: Woodrow Wilson International Center for Scholars, 2015), 19–21; Kiki Zhao, "Water from China's South–North Transfer Project Flows to Beijing," *Sinosphere* (blog), *New York Times*, 25 December 2014; and Carla Freeman, *Quenching the Dragon's Thirst: The South–North Water Transfer Project—Old Plumbing for New China?* (Washington, DC: China Environment Forum, Woodrow Wilson International Center for Scholars, 2011).

[12] Chellaney, *Water*, 154.

[13] Zhang Jincui, "Yindu yingpai xuezhe de Zhongguo guan: dui Bulama Qielani jiaoshou de gean yanjiu" [An Indian Hawk's China Outlook: The Case Study of Professor Brahma Chellaney], *Shijie Jingji yu Zhengzhi Luntan* [Forum of World Economics & Politics], no. 2 (2012): 66–79; and Liu Peng, "ZhongYin zai kuajie heliu shang de liyi: suqiu yu xianghu yilai" [Chinese and Indian Interests in Transboundary Rivers: Demands and Interdependence], *Nanya Yanjiu* [South Asian Studies], no. 4 (2013): 33–45.

Although none of these proposals have been officially endorsed, some Chinese and foreign scholars contend that China's water shortages may become so severe that the government will have no choice but to attempt to tap into the Brahmaputra. For instance, water scarcity, combined with the effects of climate change and desertification, may become so intense that a more radical scheme to divert the Brahmaputra will be needed. Similarly, a failure of the South–North Water Diversion Project to alleviate water shortages in northern China could make a plan to divert the Brahmaputra "very tempting" for PRC authorities.[14]

Plans to divert rivers from western China present several shortcomings, and there has been some internal and external opposition. First, from a cost perspective, interbasin water transfers are among the most expensive ways to increase water availability. Methods such as increasing irrigation efficiency, shallow groundwater pumping, and even intrabasin water transfers tend to be more cost-effective. Indeed, China is already moving ahead with various water-conservation measures, such as building fewer water-intensive coal plants.[15]

Second, diverting water from the Tibetan Plateau also raises serious feasibility concerns. The director of the PRC State Council's office responsible for the South–North Water Diversion Project has described a "significant gap" between preliminary work done on the western route and the "actual requirements" of the project.[16] CNA interviews conducted in 2015 also indicated that Chinese experts have concerns about the western route based on technical grounds, including the view that the Tibetan Plateau is too geologically unstable to support such a massive endeavor. Moreover,

[14] Pomeranz, "Asia's Unstable Water Tower," 6; see also Biba, "Desecuritization in China's Behavior towards Its Transboundary Rivers," 21–43.

[15] *Charting Our Water Future: Economic Frameworks to Inform Decision-making* (Washington, DC: 2030 Water Resources Group, 2009), 77; and Renee Cho, "How China Is Dealing with Its Water Crisis," *State of the Planet* (blog), Earth Institute, Columbia University, 5 May 2011.

[16] Liu, "ZhongYin zai kuajie heliu shang de liyi" [Chinese and Indian Interests in Transboundary Rivers], 33–45

given its potentially disruptive effects, plans for the western route are likely to encounter resistance on social and ecological grounds.[17]

Compared to the western route of the official South–North Water Diversion Project, Chinese experts tend to be even more dismissive of proposals to divert waters from the upper Brahmaputra. CNA interviews suggest that the Chinese government has given no serious consideration to these proposals in recent years. In fact, a study commissioned by the Ministry of Water Resources in 2000 reportedly concluded that such plans would be neither necessary nor feasible.[18] Former minister of water resources Wang Shucheng stated on at least two occasions that plans to divert the Brahmaputra were not feasible.[19] Thus, while China may eventually give some consideration to such ideas, there is no evidence to suggest that this is likely in the near future.

One of the potential obstacles to the fulfillment of these plans is opposition by local citizens and civil society groups, especially environmental nongovernmental organizations (NGOs). The record of China's efforts to build dams is checkered with cases of domestic opposition. For instance, plans to build 13 dams along the Nu River in Yunnan Province were halted in 2004 following an environmental campaign.[20] Likewise, activism by such groups as the NGO Green Watershed has led local authorities to set up resettlement funds for displaced residents along the Mekong.[21]

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[17] CNA interviews, Beijing, 2015; and Zhang Hongzhou, "China-India Water Disputes: Two Major Misperceptions Revisited," *RSIS Commentary*, 19 January 2015.

[18] Zhang, "China-India."

[19] Zhang Ke, "Diversion Debate," *China Dialogue*, 13 June 2011.

[20] The Nu/Salween River is one of the region's last free-flowing rivers. It originates in the Tibetan Plateau area as the Nu and flows through China, becoming the Salween in Burma and Thailand before it empties into the Andaman Sea. "Brahmaputra: Towards Unity," TheThirdPole.net, 10 February 2014. The plans to build the dams, however, were revived in 2013.

[21] Selina Ho, "River Politics: China's Policies in the Mekong and the Brahmaputra in Comparative Perspective," *Journal of Contemporary China* 23, no. 85 (2014): 1–20, https://doi.org/10.1080/10670564.2013.809974; and Pichamon Yeophantong, "China's Lancang Dam Cascade and Transnational Activism in the Mekong Region: Who's Got the Power?," *Asian Survey* 54, no. 4 (July/August 2014): 700–24, https//doi.org/10.1525/AS.2014.54.4.700.

Considering China's larger, long-term goals for the region, it is doubtful that domestic opposition will play a significant role in halting or slowing the speed of dam construction along the Brahmaputra. One reason is that, given the social controls present in Tibet, it is unlikely civil society groups will have the political space needed to operate as they do in other parts of the country. In addition, Chinese sources suggest that the population along the Brahmaputra is so scant that any local opposition will be negligible. For instance, a researcher with China's Ministry of Water Resources has argued that relocation programs for displaced residents will be facilitated by the small size of the population. Nevertheless, he added that local officials should proactively communicate with local residents to help them see that the construction projects are "for their own benefit."[22]

DIPLOMATIC OBSTACLES AND OPPORTUNITIES

Although driven primarily by domestic economic and developmental goals, China's dam construction on the upper reaches of the Brahmaputra has created significant friction in Sino-Indian relations. Indian analysts worry not only about the safety of Chinese dams but also about the possibility of Chinese diversion schemes. For instance, a temporary diversion of one tributary of the Brahmaputra, announced by the Chinese government in September 2016, was expected to marginally reduce water and silt flow into India.[23] This would stress Indian water resources and raise the chance of conflict between the two states. Beijing has tried, with only limited success, to reassure New Delhi that its dam construction will not have adverse consequences for India. Another source of friction emanates from Chinese concerns about India's development of the river, especially in the disputed border area of Arunachal Pradesh. In particular, Chinese government analysts are concerned that Indian construction activities farther downstream will firm up New Delhi's "actual control" over Arunachal Pradesh and thereby complicate border negotiations between the two

[22] "Brahmaputra: Towards Unity"; and "Hydro-Power Dam Stirs Debate."

[23] Limaye, Wuthnow, and Samaranayake, "China and India's Slow-Moving Path to 'Water Wars'."

countries.[24] Despite these challenges, there may be opportunities for at least a limited expansion in Sino-Indian cooperation related to Brahmaputra issues.

MUTUAL DISTRUST IN SINO-INDIAN RELATIONS

Relations between China and India have been strained for more than 50 years, just as with so many other nations that have shared borders, and the issue of the Brahmaputra River's waters are one example of these larger disputes. India is, indeed, concerned about Chinese upstream activities, which reflect a deeper problem of mutual distrust in Sino-Indian relations. This situation is driven by such factors as the ongoing border dispute, Chinese concerns over Indian ambitions and relations with the United States, Indian concerns regarding China's rapid military modernization and ties with Pakistan, and lingering resentments stemming from the 1962 China-India border conflict.[25] This mistrust is not one-sided, and India's official position about Chinese activities on the Brahmaputra has been close to that adopted by the United States in its arms-control negotiations with the Soviet Union in the 1980s: "Trust but verify."[26] Specifically, New Delhi asserts that it accepts Chinese statements but will continue to monitor China's upstream activities and convey concerns through diplomatic channels when necessary. In addition, PRC public diplomacy has not deterred Indian analysts, such as Brahma Chellaney, from circulating the argument that China harbors ulterior motives in its dam-building efforts. Thus, China still faces a trust gap with India on these issues. While Chinese interviewees contended that Sino-Indian relations have made progress under the recent efforts of President Xi Jinping and Prime Minister Naren-

[24] CNA interviews, Beijing, 2015.

[25] For more on what is also known as the Sino-Indian War, see Ivan Lidarev, "History's Hostage: China, India, and the War of 1962," *Diplomat*, 21 August 2012.

[26] Liu, "ZhongYin guanxi zouxiang chengshu ji qi yuanyin tanxi" [An Exploration of the Maturation of Sino-Indian Relations and Its Causes], 49–55.

dra Modi, most concurred that distrust remains a central problem for the two countries.[27]

Observers have been able to express limited optimism because, during the past decade, China has attempted to reduce two major Indian concerns with respect to the Brahmaputra: flooding that could be prevented with access to Chinese data and potential Chinese development activities along the river. Many of the concerns about flooding developed as a result of a major flood that took place in June 2000. In this incident, a natural dam that had formed due to a landslide on a tributary of the Brahmaputra in Tibet broke. As a result, 3–4 billion cubic meters of water poured into Arunachal Pradesh and Assam, killing 30 Indian nationals and leaving 50,000 homeless. Some Indian observers asserted that China withheld hydrological data that could have prevented the disaster; this led to friction in Sino-Indian relations.[28]

In response to Indian concerns about flooding, China and India have established a series of agreements to share hydrological data. In April 2002, China agreed to provide India with hydrological data from three monitoring stations on the Brahmaputra between June 1 and October 15 of each year, corresponding to the annual flood season. During a visit by then-Chinese President Hu Jintao to India in November 2006, the two countries agreed to establish an expert-level group to discuss hydrological data and emergency response measures. Then, in October 2013, China extended the data-sharing period from 15 May to 15 October. Data supplied by China have been used by India's Central Water Commission to inform flood forecasts.[29]

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[27] "Hydropower Station on Brahmaputra: India to Monitor Situation," *Times of India*, 15 October 2015; Murray Scot Tanner, Kerry B. Dumbaugh, and Ian M. Easton, *Distracted Antagonists, Wary Partners: China and India Assess Their Security Relations* (Alexandria, VA: CNA, 2011), 5–9; CNA interviews, Beijing, 2015; see also Lan Jianxue, *Sino-Indian Relations in the New Era: Current Status, Development Trend and Policy Recommendations* (Beijing: China Institute of International Studies, 2015).

[28] Wang Yan, "The River Wild," *News China*, January 2012.

[29] "India-China Cooperation," Government of India, Ministry of Water Resources, River Development, and Ganga Rejuvenation, updated 29 June 2017.

Chinese willingness to share hydrological data has been well received by India. This is evident in a series of joint statements made during China–India summits. For instance, in a joint statement following Chinese president Xi Jinping's visit to India in September 2014, Indian officials thanked China for providing flood season data, and the two sides agreed to continue cooperation in data sharing and in emergency response. The joint statement following Indian prime minister Modi's visit to China in May 2015 contained a nearly identical statement.[30] Thus, China appears to have gained at least some diplomatic goodwill as a result of its overtures.

China has also sought, amid the climate of mistrust, to assuage Indian concerns about Chinese development activities along the river. Indian analysts have suggested that China may seek to use its dams on the Brahmaputra to disrupt the flow of water into India in the event of a conflict or to use its control over water resources as a form of diplomatic leverage. Some Indian observers also speculate that China could attempt to store river water (or even divert the river), which would result in reduced river flow to India at a time when water sources are increasingly stressed due to population growth and global climate change effects.[31]

Nevertheless, China has sought to quell Indian concerns through official rhetoric and media commentary. In particular, Chinese sources have repeatedly asserted that China plans to build only "run of the river" dams that cannot be used to reduce or stop the flow of the river into Indian-controlled territory.[32] Moreover, China's Ministry of Foreign Affairs spokesman has stated that China's planned dams will not pose flood risks or ecological challenges to downstream areas.[33] China has also responded to

[30] "Joint Statement between India and China during Prime Minister's Visit to China," Government of India, Ministry of External Affairs, 15 May 2015; see also "Joint Statement between the Republic of India and the People's Republic of China on Building Closer Developmental Partnership," Government of India, Ministry of External Affairs, 19 September 2014.

[31] Vijai K. Nair, "The Chinese Threat: An Indian Perspective," *China Brief* 1, no. 9 (2001); and Brahma Chellaney, "China's Hydro-Hegemony," *New York Times,* 7 February 2013.

[32] Biba, "Desecuritization in China's Behavior towards Its Transboundary Rivers."

[33] *Transcript of Regular News Conference by PRC Foreign Ministry on 24 November 2014*, Ministry of Foreign Affairs of the People's Republic of China, 24 November 2014.

Indian speculation about potential river diversion schemes. For instance, a *PLA Daily* article denies any diversion plans and claims that China took Indian interests into account when it chose not to include the Brahmaputra in the South–North Water Diversion Project.[34] Yet, despite all these efforts, China's public rhetoric has largely failed to assuage Indian concerns. While Indian officials have not publicly rejected Chinese pledges that Tibetan dam building will not harm Indian interests, they remain wary.

CHINESE CONCERNS REGARDING INDIAN HYDROPOWER ACTIVITIES

While Indian officials may doubt Chinese sincerity about its intentions, the Chinese have their own concerns about the disputed territory of Arunachal Pradesh and what that means for its stated and unstated designs for the region. At present, the river is largely undeveloped as it flows through the northeastern Indian state. India's Ministry of Water Resources, River Development and Ganga Rejuvenation, however, announced plans to build dams in that section of the river to control flooding and to increase electricity production. The ministry also contends that dam construction is necessary for securing water usage rights under international practice.[35] This appears to be a step forward in firming up India's claims to Arunachal Pradesh, which China regards as its own territory under the name "southern Tibet."

Arunachal Pradesh is one of two major areas of dispute along the Sino-Indian border. The other is Aksai Chin, which lies farther to the west, and has been effectively controlled by China since 1951. Arunachal Pradesh was the main theater of the 1962 China-India border conflict, in which Chinese forces advanced into Indian-controlled territory and then withdrew, pending negotiations. At the core of China's contention is the view that Beijing has sovereignty over lands formerly held by the Tibetan

[34] Sun Peisong, "China-India Friendship Is Basis for New Order in Future of Asia," *PLA Daily (Beijing)*, 22 October 2013.

[35] "India Plans to Build Big Dams over Brahmaputra, Says Uma Bharti," *Economic Times*, 4 June 2015.

kingdom, including Aksai Chin and Arunachal Pradesh. India rejects these claims and argues that these lands belong to India as part of a 1914 treaty.[36]

Indian infrastructure development along the Brahmaputra is of particular concern for China because it could grant India leverage in border negotiations and significantly reduce the chance of China ever being able to enforce its sovereignty claims south of the Line of Actual Control.[37] Li Zhifei, an expert at the Chinese Academy of Social Sciences (CASS), who has extensively studied this issue, writes that India has used several means to strengthen its "actual control" over Arunachal Pradesh, including an increasing military presence, migration of citizens into the region, and development of water resources on rivers, such as the Brahmaputra. Li also argues that India is seeking to build dams in Arunachal to gain an "advantageous" position in border talks with China.[38] Building dams, in particular, is useful for India because it allows New Delhi to argue that it has established water user rights, regardless of China's sovereignty assertions.[39]

In addition to sovereignty concerns, Chinese observers make claims about environmental risks to China to oppose Indian downstream construction. One Chinese claim, albeit made without a clear scientific explanation, is that Indian industrial activity in Arunachal Pradesh could increase sedimentation of the river, which might raise the risks of flooding in parts of Tibet.[40] Other Chinese sources assert that rising Indian carbon emissions connected to greater industrial activity in the region could contribute to glacial melt in the Himalayas and threaten the long-term flow

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[36] John W. Garver, *Protracted Contest: Sino-Indian Rivalry in the Twentieth Century* (Seattle: University of Washington Press, 2001), 79–109.

[37] The Line of Actual Control is a 4,057-kilometer boundary between China and India that is as disputed as water rights between the countries. "Crossing the Line of Actual Control," Stratfor, 12 September 2017.

[38] Li Zhifei, "ZhongYin lingtu zhengduan zhong de shui ziyuan anquan wenti" [Water Security Issues in Sino-Indian Territorial Disputes], *Nanya Yanjiu Jikan* [South Asian Studies Quarterly], no. 4 (2013): 29–34.

[39] Prime Minister of India, "Onboard Media Interaction with PM on Return from BRICS Summit," press release, 28 March 2013.

[40] Lan, "Shui ziyuan anquan hezuo yu ZhongYin guanxi de hudong" [Water Security Cooperation and China-India Interactions], 37–43.

of the river.[41] These arguments may reflect genuine ecological concerns but also may be designed in part to provide an additional basis for opposing Indian development in the disputed region.

China has taken some steps to oppose India's development of hydroelectric dams in Arunachal Pradesh. One tactic that China has used in recent years is to leverage its influence in international institutions, such as the Asian Development Bank, to deny India funding for infrastructure projects in the disputed area. It is possible that China also will seek to use its leading position in the newly established Asian Infrastructure Investment Bank (AIIB) for a similar purpose. Moreover, CASS's Li Zhifei argues that China should continue to press these institutions to reject Indian requests for financial assistance. Given Indian domestic resources and New Delhi's impetus to develop the northeastern part of the country, it is questionable whether China will have the necessary power or influence to successfully oppose the future development of dams.[42]

OUTLOOK FOR CHINA-INDIA COOPERATION

Two factors will likely limit a future expansion of China-India cooperation related to the Brahmaputra. First is the ongoing border dispute. Contested ownership of Arunachal Pradesh means that Beijing and New Delhi will probably be unable to reach a major accord on transboundary river rights and obligations, such as a water-sharing treaty. As of 2015, there are no signs that this dispute is set to abate in the near to medium term.[43]

A second significant obstacle to cooperation—mutual distrust—in regard to the Brahmaputra must be considered. A 2014 water management game

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[41] CNA interviews, Beijing, 2015. For background on potential climate change effects on the river, see Walter W. Immerzeel, Ludovicus P. H. van Beek, and Marc F. P. Bierkens, "Climate Change Will Affect the Asian Water Towers," *Science,* no. 328 (2010): 1382–85, http://doi.org/10.1126/science.1183188.

[42] Sudha Ramachandran, "Chinese Antics Have India Fuming," *Asia Times (Hong Kong)*, 5 May 2009; and Li Zhifei, "ZhongYin lingtu zhengduan zhong de shui ziyuan anquan wenti" [Water Security Issues in Sino-Indian Territorial Disputes], 29–34.

[43] Vivek Raghuvanshi, "India-China Talks Fail to Make Progress on Border Dispute," *DefenseNews*, 17 November 2015.

conducted by CNA observed that mutual mistrust between riparian nations, driven by such factors as border disputes and terrorist actions, reduced the willingness of all three states to share information and support other types of cooperation.[44] While China and India watchers have seen this at the official level, it is even more pronounced within civil society in both countries. Indian analysts, such as Brahma Chellaney and R. N. Bhaskar, may continue to question Chinese intentions regarding dam building on the upper Brahmaputra. Meanwhile, Chinese observers will likely doubt the motives of their Indian interlocutors, whom many in China regard as biased and sensationalist. One scholar even penned an extensive review of the writings of Chellaney with respect to China, critiquing Chellaney's assertions about China's intentions to use water as a weapon as biased and unsubstantiated.[45] These sentiments could limit the prospects for productive engagements between scholars on both sides.

Nevertheless, there may still be opportunities for a modest expansion of Sino-Indian cooperation on Brahmaputra issues, most likely on narrow, technical subjects that can be separated from the border dispute. This interpretation is supported by scholars such as Lan Jianxue of the China Institute of International Studies, who argues that Sino-Indian cooperation is most likely on topics considered as "low politics," such as on economic, humanitarian, and cultural endeavors. Topics within the realm of "high politics" (e.g., the border dispute) will remain contentious.[46] Specifically, China may be receptive to cooperation in areas of disaster management, environmen-

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[44] Catherine M. Trentacoste et al., *Bone Dry and Flooding Soon: A Regional Water Game, Final Report* (Arlington, VA: CNA, 2014), 17–19.

[45] Li Zhifei, "ZhongYin lingtu zhengduan zhong de shui ziyuan anquan wenti" [Water Security Issues in Sino-Indian Territorial Disputes], 29–34; Lan, "Shui ziyuan anquan hezuo yu Zhong Yin guanxi de hudong" [Water Security Cooperation and China-India Interactions], 37–43; Li Li, "Nontraditional Security and China's Relations with South Asia," in *Ecological and Nontraditional Security Challenges in South Asia*, ed. Farooq Sobhan, Dennis Pirages, Stacy D. VanDeveer, Li Li (Seattle, WA: National Bureau of Asian Research, 2011) 33–36; and Zhang Jincui, "Yindu yingpai xuezhe de Zhongguo guan" [An Indian Hawk's China Outlook], 66–79.

[46] See Lan, *Sino-Indian Relations in the New Era*, 30–31. "Track 2" refers to engagements between nongovernmental scholars, often based at think tanks and research institutes. This is contrasted with "Track 1," which are meetings between government officials.

tal protection, and river safety, or on scientific topics, such as the effects of climate change on long-term river flow. These topics allow for some flexibility and opportunity as some may be discussed at an official level, including discussions between the water resource ministries of both states. Moreover, nonstate stakeholders may be useful in deliberations with humanitarian and environmental nongovernmental organizations engaging topics at the Track 2 level, or perhaps involving specialists from Chinese and Indian government-funded research institutes.[47]

Several drivers could promote enhanced cooperation on these issues. First, a positive overall direction in China-India relations could remove obstacles and set the stage for cooperation on transboundary river issues.[48] This would require a political consensus by Chinese and Indian leaders to prioritize mutually beneficial economic and diplomatic cooperation over the boundary dispute, which could be symbolized by regular summits and ministerial meetings. Second, China may be able to draw on its own initiatives related to the Brahmaputra to portray itself as a responsible upper riparian. For Beijing, modestly enhancing outreach on water security challenges could be a relatively low cost way to foster diplomatic goodwill with New Delhi. Third, additional progress may be facilitated if initiatives are proposed and encouraged by the Indian side. This would address the argument of some Chinese analysts that Beijing has been proactive in sharing hydrological data and that the onus is now on India to reciprocate.[49]

China could take several steps, both unilaterally and in concert with India, to reduce mistrust and achieve mutual benefits on Brahmaputra issues. First, China could invite Indian (and Bangladeshi) observers to perform site visits as a way to reassure its neighbors of its dam safety standards. Second, Beijing and New Delhi could share information on dam construction plans and goals so that both sides have greater clarity about each other's intentions and to avoid surprises, such as the September 2016 diversion announcement

[47] CNA interviews, Beijing, 2015.

[48] Liu, "ZhongYin guanxi zouxiang chengshu ji qi yuanyin tanxi" [An Exploration of the Maturation of Sino-Indian Relations and Its Causes], 49–55.

[49] CNA interviews, Beijing, 2015.

that took many in India off guard. Third, the two sides could increase cooperation in areas such as data sharing, flood control, disaster management, and biodiversity protection. None of this will resolve the underlying border dispute or eliminate mutual mistrust but could serve to reduce tensions while providing important public goods.

WATER SECURITY AND CHINA-BANGLADESH RELATIONS

Compared to those with India, China's interactions with Bangladesh related to the Brahmaputra have been relatively free of controversy, which is unsurprising since the two countries do not share a border. Beijing's cooperation with Dhaka has proceeded on several fronts. In 2008, China agreed to share hydrological data on the Brahmaputra with Bangladesh. At a summit held in 2010, China and Bangladesh agreed to improve cooperation on water-resource management, hydrological data sharing, flood control, and disaster reduction. China also agreed to assist Bangladesh with riverbed dredging and personnel training. Another memorandum of understanding (MOU) was signed in March 2015 on the sharing of rainfall data in the river's catchment area in China, which would help inform Bangladeshi flood forecasting.[50]

Sino-Bangladeshi cooperation on Brahmaputra issues is consistent with a broader expansion of the bilateral relationship in recent years. As of 2015, Beijing is Dhaka's largest trade partner, and Bangladesh plays an important role in China's vision of creating a "21st Century Maritime Silk Road" stretching from Asia to Europe and part of China's Belt and Road Initiative (BRI).[51] China is also vying with India for influence in Bangladesh. In recent

[50] "China Assures Preferential Treatment for Bangladeshi Products: Three Agreements Signed at Summit Talks," *Bangladesh Economic News*, 24 September 2008; *Joint Statement Between the People's Republic of China and the People's Republic of Bangladesh*, Ministry of Foreign Affairs of the People's Republic of China, 22 March 2010; and Abu Bakar Siddique, "China to Give Brahmaputra Flow Data to Bangladesh," TheThirdPole.net, 20 May 2015.

[51] ASMG Kibria, "Bangladesh Juggles Chinese, Japanese Interest," *Diplomat*, 5 January 2015; and Capt David L. O. Hayward, "The Dragon's Pearls: China's Road to Hegemony in the Indian Ocean," *Marine Corps University Journal* 7, no. 1 (Spring 2016): 46–82, https://doi.org/10.21140/mcuj.2016070103.

years, both Beijing and New Delhi have reached out to Dhaka with various economic proposals and incentives.[52] In this context, Chinese willingness to share hydrological information and provide assistance in river dredging may simply be designed to cultivate diplomatic goodwill with Bangladesh. Moreover, Beijing has sought to reassure Dhaka (as well as New Delhi) that it has no plans to divert the Brahmaputra.

As the demands for water become a three-way discussion between the major stakeholders, China is able to use Bangladesh's practical needs as an arguing point that is useful in distracting from Chinese designs on the regions for their own benefit. Thus, the perceived threats that Bangladesh faces from Indian development activities upstream have become a counterpoint to India's concerns about Chinese dam building in Tibet. Various Chinese analysts have highlighted India's water diversion plans as a challenge that could have severe economic and ecological effects on India's downstream neighbor.[53] For instance, in a CNA interview in Beijing in 2015, one Chinese expert argued that potential Indian diversion plans could harm Bangladeshi interests, and that Bangladesh "has a right to say something" as a threatened downstream riparian nation. The subtext of these comments appears to be that India may be applying a double standard in critiquing China's upstream development initiatives.

MULTILATERAL COOPERATION IN THE BRAHMAPUTRA BASIN

China has centered its diplomatic outreach on Brahmaputra issues at a bilateral level. It has signed hydrological data-sharing agreements with both India and Bangladesh, but it has not engaged the two countries in a multilateral setting, which is consistent with a larger pattern of bilateralism in China's water diplomacy. However, there are signs that Beijing could be willing to expand cooperation with both New Delhi and Dhaka at a basin-wide level.

[52] See "India's Modi Hopes to Tamp Down China's Influence in Bangladesh," *VOA News*, 27 May 2015.

[53] Jonathan Holslag, "Assessing the Sino-Indian Water Dispute," *Journal of International Affairs* 64, no. 2 (2011): 19–35.

LIMITED MULTILATERALISM

In general, China's water diplomacy has focused on achieving bilateral agreements with neighboring states. Aside from its agreements with India and Bangladesh, China has signed accords on boundary and cross-border rivers with Russia, Kazakhstan, Kyrgyzstan, Mongolia, North Korea, and others. These agreements are diverse in scope, covering such issues as water navigation, hydrological projects, environmental protection, emergency notification, and data sharing. Many are more substantial than the limited China–India pacts on the Brahmaputra, largely because China has no border disputes with these other countries.

By contrast, China has avoided multilateral diplomacy as a way to solve shared water challenges. China was one of three states (the others being Turkey and Burundi) that voted against the 1997 United Nations Watercourses Convention, which outlines principles for cooperation related to international waterways, such as transboundary rivers, and procedures for dispute resolution. The reasons China's UN representative gave for his country's opposition to the treaty include inadequate protection of state sovereignty and an "imbalance" between the rights and duties of upper and lower riparians. China also has declined to participate in the World Commission on Dams, which provides guidelines for dam construction.[54]

In addition, China has been reluctant to participate in multilateral water agreements at a regional level. This is illustrated by China's approach to the Mekong River Commission (MRC), which was established in 1995 to govern activities among Mekong River states. Although China has been a dialogue partner of the commission since 1996, it has not sought full membership, largely due to the concern that doing so would impose restrictions on its upstream dam-building plans.[55] Rather, as Selina Ho, an expert on Chinese

[54] Huipeng Chen, Alistair Rieu-Clark, and Patricia Wouters, "Exploring China's Transboundary Water Treaty Practice Through the Prism of the UN Watercourses Convention," *Water International* 38, no. 2 (2013): 217–30, https://doi.org/10.1080/02508060.2013.782134; United Nations General Assembly, "General Assembly Adopts Convention on Law of Non-Navigational Uses of International Watercourses," press release, 21 May 1997; and Ho, "River Politics," 8.

[55] Ho, "River Politics," 8; and Beth Walker, "China and India Ignore UN Watercourses Convention," *Chinadialogue* (blog), 18 August 2014.

transboundary river issues argues, China has opted to seek agreements with Mekong states on a bilateral basis.[56] Nevertheless, China has adopted limited multilateral cooperation with the MRC, which is discussed in greater detail in the following section.

China's preference for bilateral diplomacy on Brahmaputra issues is consistent with this larger pattern. This preference may be underscored by two factors. The first factor is the absence of existing institutions relevant to discussions among all three riparians. The South Asian Association for Regional Cooperation (SAARC), for instance, does not include China, while the Shanghai Cooperation Organisation (SCO) does not include Bangladesh. The second factor is the deeper problem of mutual distrust, not only in China-India relations but also in India-Bangladesh relations, which some PRC analysts argue would undermine any plans to promote cooperation on a basin-wide scale.[57] In effect, Beijing may have concluded that it is more practical and effective to work with New Delhi and Dhaka separately than to work with them together.

POSSIBLE COOPERATION

There are several reasons why China may revisit its current preference for bilateralism on Brahmaputra issues. First, at a broad level, China has participated in, and even shaped, multilateral regimes and institutions since the 1990s.[58] This is evident, for example, in China's role in organizing the Six Party Talks on North Korea and in its participation in the Association of

[56] Ho, "River Politics," 8.

[57] CNA interviews, Beijing, 2015.

[58] Joel Wuthnow, Xin Li, and Lingling Qi, "Diverse Multilateralism: Four Strategies in China's Multilateral Diplomacy," *Journal of Chinese Political Science* 17, no. 3 (September 2012): 269–90; Kuik Cheng-Chwee, "Multilateralism in China's ASEAN Policy: Its Evolution, Characteristics, and Aspiration," *Contemporary Southeast Asia* 27, no. 1 (2005): 102–22; and Hongying Wang, "Multilateralism in Chinese Foreign Policy: The Limits of Socialization," *Asian Survey* 40, no. 3 (May–June 2000): 475–91.

Southeast Asian Nations (ASEAN) Regional Forum.[59] China has also sought to play a more prominent role in SAARC, which includes both India and Bangladesh. Thus, if anything, China's bilateral approach to water diplomacy is increasingly out of step with its confidence that multilateralism in other policy arenas can support Chinese interests.

Second, there is a precedent for Chinese participation in water diplomacy at a basin-wide level. Namely, China signed an agreement with the MRC in 2002 to supply hydrological data from 15 June to 15 October of each year, a period corresponding to the monsoon season. That agreement was expanded in 2008 and again in 2013. China has also cooperated with the MRC through technical exchanges in areas such as river navigation and hydropower development. In December 2014, China's vice minister of water resources stated that Beijing hoped to strengthen cooperation with the MRC, such as in conducting a joint scientific study on water flow fluctuations in the river basin.[60] In October 2016, an editorial in China's semiofficial *Global Times* praised multilateral cooperation in the Lancang-Mekong River basin and argued that it could become a useful guide for tripartite cooperation for the Brahmaputra riparians.[61]

Third, the barriers to basin-wide cooperation on the Brahmaputra are likely not insurmountable. For one thing, the lack of an existing mechanism does not necessarily rule out cooperation. In other contexts, China has established new bodies to address transnational challenges when one did not currently exist. For instance, China helped establish the SCO to address terrorism and other challenges in Central Asia. China also may be receptive to the possibility that existing bodies, such as the Bangladesh–China–India–Myanmar (BCIM) Forum for Regional Cooperation could be expanded to address water issues. In addition, mutual distrust has not pre-

[59] The Six Party Talks, held between 2003 and 2009, involved discussions between China, Russia, South Korea, North Korea, Japan, and the United States regarding North Korea's nuclear program. The ASEAN Regional Forum, launched in 1994, is a venue for discussions between ASEAN member states and others, including China, the United States, and the European Union.

[60] Zhang, "China-India: Revisiting the 'Water Wars' Narrative."

[61] Hu Weijia, "No Need for Concern in India over China's Blockage of Brahmaputra River Tributary," *Global Times (Beijing)*, 10 October 2016.

vented China from engaging in productive bilateral talks with India, and there is no reason why it would preclude similar discussions at a multilateral level. The key appears to be whether cooperation can be insulated from higher-level political tensions and focus instead on shared technical or humanitarian issues.[62]

China has several incentives to cooperate with other Brahmaputra riparian nations in a multilateral context. China's reputation would benefit if they took a leading role in proposing basin-wide cooperation.[63] As it has with other regional initiatives, such as the AIIB, China could argue that it is engaging proactively as a responsible regional stakeholder.[64] Additionally, basin-wide cooperation could help reduce a source of friction on China's western periphery at a time when it faces increasing challenges in its eastern maritime region and in its relations with the United States and others. Finally, at a practical level, a basin-wide approach could yield a more holistic understanding of the river system and insights into how to address flooding and other challenges.[65] Thus, while a major multilateral accord may not be possible, China will likely be willing to explore lower-level cooperation with its downstream neighbors.

A starting point would be the establishment of an annual Track 2 dialogue with participation from university and think tank scholars from China, India, and Bangladesh. While there are many promising topics for discussion, one possibility would be to limit the initial focus to technical and scientific subjects, such as the effects of climate change on river flow and potential mitigation strategies. Such talks could also involve input from international specialists on a case-by-case basis. Over time, these

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[62] CNA interviews, Beijing, 2015.

[63] Lan, "Shui ziyuan anquan hezuo yu ZhongYin guanxi de hudong" [Water Security Cooperation and China-India Interactions], 37–43; and "Brahmaputra: Towards Unity," 20–21.

[64] "Brahmaputra: Towards Unity," 20–21.

[65] CASS's Li Zhifei even argues that basin-wide cooperation would reduce the chances that outside powers, such as the United States, would be able to interfere in regional affairs. Li Zhifei, "Shui ziyuan waijiao: Zhongguo zhoubian anquan goujian xin yiti" [Water Resource Diplomacy: A New Topic in Constructing China's Peripheral Security] *Xueshu Tansuo* [Academic Exploration], no. 4 (2013): 28–33.

Track 2 interactions might form the basis for cooperation at the Track 1 level.

CONCLUSION

In sum, managing the Brahmaputra has been a dilemma for the river's uppermost riparian. Chinese officials and analysts see the river as a key to the development of Tibet and as part of a larger shift toward greater reliance on clean energy sources. Yet Beijing has had to reassure New Delhi of its positive intentions while also expressing its own concerns about India's construction activities in Arunachal Pradesh. As this chapter has shown, the chances of a full water-sharing treaty between the two states is low due to mistrust and the underlying border dispute. However, opportunities might exist for expanded practical cooperation both at a bilateral and a multilateral level, such as increased data sharing and dialogue between the riparian countries. This will not eliminate mistrust but could reduce the risk of conflict while providing concrete benefits to those who live along the river. This cooperation will be needed, especially as China and India continue with their large-scale dam activities in the coming years.

CHAPTER 2

UPSTREAM, DOWNSTREAM: REFLECTIONS ON INDIA'S RIPARIAN RELATIONSHIPS ON THE BRAHMAPUTRA

SATU LIMAYE

In 2005, Li Ling, an officer in China's 2d Artillery Corps, published *Xizang Zhi Shui Jiu Zhongguo* (Tibet's Waters Will Save China), in which he argued for diverting the Brahmaputra River to meet the country's domestic water shortages elsewhere. India was alarmed. The specter of the Brahmaputra River's water being diverted from flowing into undeveloped northeast India led to public outcry, parliamentary questions, and government responses.[1] The episode also highlighted a new area of discord and distrust in Sino-Indian relations at the start of the twenty-first century, just as both countries achieved much faster rates of economic growth and aspirations for more robust international roles.

The Brahmaputra dispute also has deeper roots in distrustful relations originating in the breakdown of bilateral relations in the late 1950s, the brief border war in October 1962 that ended in a humiliating defeat for India, and the continuing close cooperation between China and India's antagonistic neighbor, Pakistan. The May–June 2017 standoff between the Indian Army and the PLA on the Doklam plateau—though not directly connected to the Brahmaputra River dispute—illustrates the contested state of Sino-Indian relations across the northern border where the two countries meet.[2] The link between territory and sovereignty and the Brah-

[1] *Construction of Dam on Brahmaputra by India*, Government of India, Ministry of External Affairs, 23 November 2006.

[2] For more on the incident, see Franz-Stefan Gady, "Amid China-India Border Standoff: China Holds Military Exercise in Tibet," *Diplomat*, 18 July 2017.

maputra issue appears to have grown more acute in recent months. China's *Global Times*, for example, reported that the Brahmaputra river water data sharing cutoff began at least as early as 20 August due to India's lack of respect for China's sovereignty in the context of the Doklam dispute.[3] An Indian government spokesman confirmed the lack of data.[4]

Given this background, India's focus on the Brahmaputra River is framed almost entirely with reference to China. However, the reality is that India is physically a *middle riparian* country—between upstream China and downstream Bangladesh. India's physical position as the middle riparian creates complexity in its interests, attitudes, and decisions regarding how to handle international cooperation with both its two Brahmaputra neighbors. This challenge is further complicated by two other factors. The first is the public versus government debate in India in which the Indian government persistently presents a sober and cautious assessment of the threats posed by China regarding access to Brahmaputra river waters, which is contrasted with the more strident and shrill concerns expressed by the media and some analysts. The second factor is the strong influence of center-state relations between the national government in New Delhi and elected governments in the northeastern states as well as the lack of consensus among the latter. India's middle riparian quandaries thus refers to different interests and concerns vis-à-vis its two shared riparians—upstream China and downstream Bangladesh—as well as the domestic discord that constrains how New Delhi handles matters regarding the Brahmaputra River.

For India, the Brahmaputra River is of great *political* significance because it is a transboundary river that originates in China. However, a deep political distrust continues to shadow this new area of India-China relations. Three drivers shape India's policies concerning the Brahmaputra River as they relate to China: China's plans to dam and possibly divert the

[3] Zhao Yusha, "China Has to Halt River Data Sharing as India Infringes on Sovereignty: Expert," *Global Times (Beijing)*, 20 August 2017.

[4] Shri Raveesh Kumar, *Transcript of Weekly Media Briefing by Official Spokesperson (August 18, 2017)*, Government of India, Ministry of External Affairs, 23 August 2017.

river; New Delhi's desire to uphold user rights on the river and consolidate its existing hold on disputed territory; and India's need to manage flooding and soil erosion in its northeastern states as well as produce electricity through dam construction.

Relations with Bangladesh regarding the Brahmaputra River tend to be an afterthought in India, primarily because of the salience of concerns about China, but also because there are more contested riparian issues, not to mention political and security problems in India-Bangladesh relations. Still, India has opportunities with both China and Bangladesh to further modest cooperation by fully and finally implementing existing agreements and being more transparent about its own plans for dam building and river-linking projects. India's interest in a multilateral approach may yet be a bridge too far, but New Delhi could pursue ecological and environmental initiatives on issues ranging from pollution to glaciers that could be introduced into bilateral and eventually trilateral cooperation.

INDIA AND THE BRAHMAPUTRA RIVER BASIN

India is the middle riparian country, between China and Bangladesh, on the Brahmaputra River (map 2.1). The river's unruly, braided physical flow through the three countries parallels a tricky political configuration. The river originates in troubled Tibet, a recurring source of India-China discord since the Dalai Lama fled to India in 1959.[5] It flows through land that is still contested by China and India following a 1962 border conflict. The river serves as both a socioeconomic resource and occasional threat to livelihoods in India's isolated northeast region, which is increasingly being integrated into "mainland" India. And finally the Brahmaputra becomes a critical lifeline for Bangladesh, whose India-centric historical origins and land, as well as riparian connections, create fraught relations.

Measured by population and territory, India is *physically* implicated in the Brahmaputra basin only marginally, certainly compared to the

[5] C. Raja Mohan, a leading Indian analyst, argues that Tibet is key to overall India-China relations. Cited in Ellen Bork, "Caught in the Middle: India, China and Tibet," *World Affairs* (May/June 2015).

Adapted by Pete McPhail, based on data from "Disputed Area of Kashmir," Library of Congress, Geography and Map Division; and "China-India Border: Eastern Sector," University of Texas, Austin

Map 2.1. India's middle riparian position on the Brahmaputra River.

impact of other major river systems in India. Only an estimated 3 percent of India's population resides in the Brahmaputra basin. (China is roughly 1 percent and Bangladesh an estimated 70 percent.) About 6 percent of India's national territory lies within the Brahmaputra basin—China represents 3 percent and Bangladesh 27 percent.[6] The region of India through

[6] Author's estimate calculated using multiple sources, mainly "Ganges-Brahmaputra-Meghna River Basin," 111–13; and National Research Council, *Himalayan Glaciers: Climate Change, Water Resources, and Water Security* (Washington, DC: National Academies Press, 2012), 51, https://doi.org/10.17226/13449.

which the river flows is neither highly industrialized nor a major area of agricultural productivity, though agriculture is among the main sources of livelihood for the citizens who live there.

But the Brahmaputra River holds great *political* significance for India because it is a transboundary river that originates in China, runs through Tibet, flows into disputed territory in India's isolated and underdeveloped northeast, and continues into Bangladesh, with which India has critical but difficult riparian relations.

India's middle riparian position provides it with a whole-of-basin perspective. But its discrete, distinct interests and troubled relations with its upper- and lower-riparian neighbors—as well as with India's northeastern states through which the river flows—pull India's concerns, drivers, and cooperative and competitive activities in complex, inconsistent directions, shaping India's intense debate and mixed policies regarding the Brahmaputra River.

Thus, to understand why India has this whole-of-basin perspective, with all of the concomitant benefits and challenges, we must first examine Sino-Indian relations, India's internal dimensions, and, finally, interactions between Bangladesh and India regarding the river. This north-south geographical, analytical approach accurately captures not only the physical flow of the river but also the relative hierarchical primacy of China, India's northeast, and Bangladesh to India's Brahmaputra River policies.[7]

INDIA-CHINA RELATIONS REGARDING THE BRAHMAPUTRA RIVER

During the past decade, India and China have steadily increased their dialogue and water-related, information-sharing agreements on the Brahmaputra and other shared rivers. However, a deep political distrust continues to shadow this new area of India-China relations. Unless the border/ter-

[7] Author's phrase created to emphasize that the hierarchy of India's interests regarding the Brahmaputra River mirrors the natural flow of the river from north to south, from China, to northeastern Indian states, and finally Bangladesh.

ritorial dispute is resolved, India and China will have difficulty reaching a water-sharing agreement.

In India's open society, with its freewheeling press and robust democracy, various stakeholders have the freedom to take sides on national issues, and this is no less true in relation to debates over relations with China regarding the Brahmaputra River. Indian scholars, policy analysts, retired government officials, members of the media, and some in parliament (mostly representatives from the northeastern states of Arunachal Pradesh and Assam) express the most acute concerns and worst-case assessments about China's activities. While these voices mostly highlight concerns about China's plans to dam and divert the river, for example, India's government tends to publicly downplay concerns about whether India will have an adequate quantity and quality of water and focuses on emerging cooperation with China.[8] India's government and civil society are more closely aligned in expressing worries about China's transparency on upper-riparian activities. In other words, distrust of China is shared broadly in India, even as intense debates persist about China's activities and intentions as well as their implications for India.

The parallel development and current coexistence of India's vigorous debate about threats from China on the one hand, and incremental and limited dialogue and hydrological information sharing between the two governments on the other, have resulted in even Indian interlocutors debating whether conflict or cooperation is the dominant or counternarrative in India-China relations regarding the Brahmaputra River. India's debate about the China factor regarding the Brahmaputra reflects some-

[8] A search of India's Ministry of External Affairs (MEA) website on 27 October 2015 returned approximately 100 references to the Brahmaputra River. Except for government statements, articles, and other documents included in these search findings, a high percentage of Lok Sabha (lower house of parliament) and Rajya Sabha (upper house of parliament) questions come from representatives of the northeastern states of Arunachal Pradesh and Assam. Moreover, a small, representative sampling of the voluminous writings that focus on India's views of China's potential threats include: Chellaney, *Water*; Simon Denyer, "Chinese Dams in Tibet Raise Hackles in India," *Washington Post*, 7 February 2013; Archana Chaudhary, "India Plans Dam on Tsangpo-Brahmaputra to Check Floods and China," *Bloomberg*, 4 June 2015; and R. N. Bhaskar, "What Chinese Dam Means to India," *DNA* (*Mumbai*), 27 November 2014.

thing of a divide between technical experts and international relations or political experts. Technical experts tend to see *both* Indian and Chinese plans for dams and other activities on the Brahmaputra as problematic, whereas India's political experts tend to focus on the problematic features of China's activities for India. This is not surprising, but in the swirling, cacophonous debate within India, the technical versus political divide adds to the complexity of the government's policy challenges toward the Brahmaputra River. As a result, Indian officials have prioritized alleviating domestic concerns by confirming that China does not have plans to divert water, highlighting that much of the water flow originates in India's territory, and seeking hydrological data that would help the government better plan flood control in the flood-prone northeastern states.

Despite the government's restrained approach, the generally poor state of Sino-Indian relations and the fact that the Brahmaputra River runs through disputed territory continue to drive India's anxieties. India-China relations, 56 years after a brief October 1962 border war that ended in India's defeat, now mix competition and cooperation, but remain mired in historical animosity, distrust, and serious unresolved issues. China claims at least part of the area where the Brahmaputra River enters into what India regards as the state of Arunachal Pradesh but China considers "southern Tibet."[9] And as recent tensions over the Doklam plateau show, Sino-Indian tensions across their frontier persist.

Three additional drivers most influence India's policies regarding the Brahmaputra River: China's plans to dam and possibly divert the river; New Delhi's desire to uphold user rights on the river and consolidate its existing hold on territory; and India's need to manage flooding and soil erosion in its northeastern states.

[9] One example is the ongoing controversy over China and India's dueling depictions of the territory in maps and on passports. Other sources include Bork, "Caught in the Middle"; and CNA interviews, Beijing, 2015.

INDIA'S PRIMARY CONCERNS ARE CHINA'S DIVERSION AND DAM PLANS

By far, India's most intensely debated concern is China's damming and possible diversion of the river to meet the needs of northern and western regions of China that are more populous, agricultural, industrial, or urban than remote, underpopulated southern Tibet.[10]

India's debate about China's upper riparian activities took off in 2005 following publication of Li Ling's book *Xizang Zhi Shui Jiu Zhongguo* (Tibet's Waters Will Save China). The book suggests various options for diversion of river waters in the amount of 200.6 billion cubic meters (BCM), of which the Brahmaputra would account for the overwhelming share at 118.8 BCM. Reportedly, soon after the book was published, India pursued numerous cross ministry and cross agency studies to investigate and respond to Chinese activities.[11]

After constructing China's first major dam, Zangmu, on the upper reaches of the Brahmaputra in 2010 (operational in November 2015), Indian officials in the Ministry of External Affairs issued a key statement in June 2011 reflecting the Indian government perspective. Officials stated that, despite recent reports about China's building of the Zangmu Dam, they

> have ascertained from our own sources [presumably a reference to work by India's NRSA and NTRO] that this is a run of the river hydro-electric project, which does not store water and will not adversely impact the downstream areas in India. Therefore I [Ex-

[10] For China's perspectives on the Brahmaputra, see the China chapter for this project by Joel Wuthnow.

[11] The contemplated amount of diversion is taken from information provided during CNA interviews, New Delhi, 2015. Reportedly, the government of India convened the first interministerial committee of secretaries, or COS, meeting in October 2006 to investigate the issue of diversion of water by China. Subsequently, at least two meetings were held, though it seems likely that they met several times. India also initiated efforts by the National Remote Sensing Agency (NRSA) and National Technical Research Organisation (NTRO) to gauge China's activities. The Central Water Commission also undertook studies around this time "to compute the potential of water generated on the Indian side and updated [an] earlier assessment." A media account of India's approach is by Utpal Bhaskar, "India Firms up Its Strategy on Brahmaputra Water Diversion," *LiveMint*, 20 November 2013.

> ternal Affairs Minister S. M. Krishna] believe there is no cause for immediate alarm. I would like to share with you the fact that a large proportion of the catchment of the Brahmaputra is within Indian territory.[12]

The Indian government's assertion of adequate water flows has been much debated and contested. A 1996 World Bank report asserts that the Brahmaputra River and its 52 major tributaries have a total catchment area of 580,000 square kilometers: 33.6 percent of that lies within India; 50.5 percent in China; 8.1 percent in Bangladesh; and 7.8 percent in Bhutan.[13] The debate in India focuses on where most of the water flow comes from. Estimates vary, but at least some in India argue that

> significantly, only 40 percent of the water comes from the Chinese catchment area. Some policymakers [*sic*] in Delhi believe that the precipitation in China contributes only 7 percent to the flow. It is the Brahmaputra's tributaries in Arunachal Pradesh, along with the rains in India that contribute to the rest of the river's water supply. That could explain the absence of any shrill reaction from officials in New Delhi.[14]

China's expanding dam construction continues to split Indian assessments between the government and civil society critics, and even creates fissures between Indians who see China's dams as the main problem versus those who see *all* dams on the Brahmaputra River as a problem. Prominent experts such as Brahma Chellaney dismiss the government's assurances and argue that China's dam building is expanding, moving closer to India's border, and providing China with "its growing capacity to serve as the up-

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[12] "Reports of Construction of a Dam on Brahmaputra River by China," Government of India, Ministry of External Affairs, 14 June 2011.

[13] *Development and Growth in Northeast India: The Natural Resources, Water, and Environment Nexus* (Washington, DC: World Bank, 2007), 33.

[14] See Bhaskar, "What Chinese Dam on Brahmaputra Means to India."

stream controller by re-engineering transboundary flows through dams."[15] Others, such as former secretary of water resources Ramaswamy R. Iyer, argue that, for technical hydrological reasons, even China's run-of-the-river projects are "a matter of utmost concern to lower riparian countries."[16] Meanwhile, India continues to pursue incremental and limited riverine cooperation with China—even though it is unable to influence China to cease dam construction. India is also faced with considerable constraints to move forward with its own dam-building plans, beset by discord with the state governments in Arunachal Pradesh and Assam.

INDIA'S USER RIGHTS AND DISPUTED TERRITORY

Another priority for India regarding China has been one of upholding its riparian rights by declaration and actions such as dam building. A Technical Expert Group (TEG) headed at the joint secretary level in the Ministry of Power reportedly was established in 2008 based on the recommendations of an earlier COS meeting held on 21 October 2008. The TEG would include representatives of the Ministry of Water Resources; Department of Road Transport and Highways; Ministry of Environment, Forests and Climate Change; Ministry of External Affairs (MEA); and the Arunachal Pradesh state government "to draw up an Action Plan for establishing India's user rights on Brahmaputra and its tributaries coming from China." The TEG's first recommendation was that "in order to establish the 'First User' Rights, the first priority would be to complete Lower Subansiri

[15] Brahma Chellaney, "China's Freshwater Grab, " *Japan Times*, 2 November 2015.

[16] See Sudha Ramachandran, "Water Wars: China, India and the Great Dam Rush," *Diplomat*, 3 April 2015. Iyer goes on to say that China's run-of-the-river hydroelectric project "spells death for the river" because the turbines operate intermittently in these projects, "which means that the waters are held back in pondage and released when the turbines need to operate, resulting in huge diurnal variations—from 0 percent to 400 percent in a day—in downstream flows. No aquatic life or riparian population can cope with that order of diurnal variation." In Iyer's final book, *Living Rivers, Dying Rivers*, released by India's vice president Hamid Ansari, he offered a "pox on both houses" critique: "In particular, the most well known of them, the Brahmaputra, is now the victim of project planning by both China and India, with Bangladesh also involved in the controversy as the anxious lower riparian. . . . *One shudders to think of . . . the consequences of interventions in this river by the state, whether Chinese or India*," emphasis added. Cited in R. Umamaheshwari, "A Visionary on Water Issues," *Hindu*, 14 September 2015.

[District] . . . the Lower Siang [District] . . . and Demwe Lower [dams]." A second recommendation "would be for State Government of Arunachal Pradesh to expeditiously allot at least one major project in these basins as close to the international border as possible, and get them implemented promptly, in order to quickly and more firmly establish 'Existing User' rights."[17]

During the past decade, India's officials have repeatedly invoked India's riparian rights and linked dam building to asserting these rights. For example, Minister of State for External Affairs Shri E. Ahmad stated in parliament that India "is a lower riparian state with considerable established user rights to the water of the River." In mid-June 2015, India's additional secretary in the Ministry of Water Resources, Amarjit Singh, tied India's dam building directly to establishing India's riparian rights, saying, "Once we have a storage dam, we get the right for that quantum of water as a riparian state under the international practices. If you have a storage dam in India on an international river, it gives us [the] right for that much water." Indian media have picked up government statements that dam building is motivated by the desire to establish user rights on the river—disregarding the fact that India already has user rights as a lower riparian on the transboundary river.[18]

India's anxiety about asserting its riparian rights on the Brahmaputra River does not appear to stem from a legal or political challenge to these rights by China; there is no evidence that Beijing has challenged these rights, and official statements between the two countries repeatedly reference that China will respect these rights. More likely, its anxiety comes from the objective of *consolidating* India's rights to the *territory* where the transboundary Brahmaputra flows rather than to the waters of the river per se. India believes this is a prudent course of action given the disputed territory

[17] Information provided during CNA interviews, New Delhi, 2015.

[18] "Q.1898 Construction of Dam on Brahmaputra by China," Government of India, Ministry of External Affairs, 14 March 2013; "Govt Plans to Build Big Dams over Brahmaputra: Uma Bharti," *LiveMint*, 4 June 2015; and Chaudhary, "India Plans Dam on Tsangpo-Brahmaputra to Check Floods and China."

through which the river flows and China's international efforts to challenge India's claims to the territory. In March 2009, China moved to oppose a nearly $3 billion Asian Development Bank (ADB) loan to India because it included funding for a $60 million flood management and hydrological program in Arunachal Pradesh. Not surprisingly, some Chinese certainly see India's goal as one of consolidating its hold over disputed territory.[19]

Dam building has been an extremely slow and limited process in India, largely due to political and civic opposition to dam construction, but also because of financial and technical constraints. This situation stands in stark contrast to the robust dam building on China's portion of the upper Brahmaputra River. India has plans to build several dams to consolidate its hold on territory and further establish riparian rights, control flood and soil erosion, develop hydroelectric power, and contribute to the overall development of the northeast region. The precise number of planned dams is not easy to nail down. During interviews by CNA analysts done in New Delhi, the number cited ranged in the mid-hundreds.

Few believe, however, that even a fraction of these dams will be built. Recently, Himanshu Thakkar from the South Asia Network on Dams, Rivers and People pointed to the disapproval of locals and the difficulties of construction. He noted that the "big projects are difficult to build, and dangerous to manage in mountains that are on highly silt laden rivers, in a region rich in biodiversity and prone to earthquakes and flooding. The lives and livelihoods of so many millions are dependent on these resources. Most of the dams will never be built."[20] Moreover, outside groups put up roadblocks as well. In 2013, Brahma Chellaney wrote: "Plans for large water projects in India usually run into stiff opposition from influential NGOs, so that it has become virtually impossible to build a large dam, blighting the promise of hydropower."[21]

[19] See National Research Council, *Himalayan Glaciers*, 89; Girish Shirodkar, "Playing Chinese Checkers with India's Hydro Sector," *New Spotlight*, 20 July 2012; and for China's perspectives on the Brahmaputra, see the China chapter for this project by Joel Wuthnow.

[20] Keith Schneider, "Big India Dam, Unfinished and Silent, Could be a Tomb for Giant Hydroelectric Projects," *Circle of Blue*, 6 April 2015.

[21] Brahma Chellaney, "South Asia's Growing Water Insecurity," *Defense Dossier*, no. *7* (May 2013): 17.

Despite the plans and construction on the Brahmaputra, the U.S. National Research Council concluded that "the Brahmaputra is the least dammed of the major rivers in the region. In contrast, both the Ganges and the Indus are highly dammed."[22] This assessment takes into account China's dams. There are a limited number of dams in the Brahmaputra River basin compared to South Asia's other major river basins (map 2.2).

MANAGING FLOODING AND SOIL EROSION

Political and territorial issues aside, India needs to address practical issues concerning the river, and environmental and sustainability problems combined serve as one of the factors driving Indian policy about the Brahmaputra. Soil erosion is a major feature in the northeast India catchment area. According to the Brahmaputra Board of India's Ministry of Water Resources, "Due to heavy deposition of silt, the river has frequently changed its course. Excessive silt deposition has also given rise to [a] braiding and meandering pattern in the alignment of the river system."[23] High siltation arises from many factors, including landslides due to heavy rainfall in the area, earthquakes, and manmade actions, such as changes in cultivation patterns and exploitation of forest resources in the hills above the valley through which the river runs. Northeast India specialists often highlight the fact that adapting to floods and soil erosion is a major struggle for the residents of the region.

However, flooding is the driver that directly initiated India's cooperative outreach to China, resulting in the current ongoing dialogue and limited hydrological data-sharing agreements. India's concerns about flooding in its northeastern states date from the early 2000s. In 2000, in response to a parliamentary question, Ajit Kumar Panja, then minister of state for external affairs, replied, "Following the recent flash flood in Arunachal Pradesh in June 2000, the matter was taken up with the Chinese Government. They conveyed that there was no dam on the Chinese side on the river Brahmaputra and attrib-

[22] National Research Council, *Himalayan Glaciers*, 61.

[23] "Master Plans—River System," Brahmaputra Board, Ministry of Water Resources.

Courtesy of Pete McPhail, based on data from National Research Council, *Himalayan Glaciers*, 61; South Asia Water Initiative; and Water Resources Information System of India

Map 2.2. The Brahmaputra River basin has fewer dams than other major South Asia river basins.

uted the occurrence of floods on the Indian side to natural causes."[24] India's government seems to have concurred that the flood was a natural disaster. Information provided during interviews in New Delhi referred to an incident in which NTRO monitoring revealed "some water blockage . . . at Great Bend [Shuomatan Point] in the Brahmaputra river basin possibly due to a natural landslide."[25] Either by virtue of the facts, or just to keep the communications

[24] For a media report at the time, see Nitin Gogoi, "Army Suspects Chinese Hand Behind Flash Floods in N-E," *Rediff*, 23 August 2000; and "Q. 2104—Breach of Dams Constructed by Chinese Authorities," Government of India, Ministry of External Affairs, 10 August 2000.

[25] CNA interviews, New Delhi, 2015.

viable, Indian officials have been willing to accept China's word regarding the cause of the 2000 flood.

But the importance of flood management, whether because of China's activities (intentional or unintentional) or natural causes, remains a driver of India's approach with China and the northeastern states. India-China bilateral discussions on cooperation about the river began in the early 2000s as a result of these flooding concerns—well before any Chinese dams had been constructed on the upper portions of the Brahmaputra and well before debates erupted in India about China's plans to divert the river waters.

At a press briefing during the January 2002 visit of China's Premier Zhu Rongji, India's government reiterated that flood control and disaster prevention were driving efforts at bilateral cooperation and mechanisms with China. Following a major flood in India's northeast in June 2000, the *Memorandum of Understanding upon Provision of Hydrological Information of the Brahmaputra/Yalung Tsangbo River in Flood Season by China to India* was signed in 2002 and renewed in 2008.[26] According to the MOU, the two countries agreed to share data for the benefit of China's downstream neighbors. Sharing information on the flow of water both in flood and nonflood seasons is critical downstream in the event of a sudden shortage or surplus of water. In response to a question about China diverting the river, an Indian official said, "I believe that these reports have been denied by the Chinese side. There is a level of mutual confidence inherent to this agreement."[27] Since this statement, India's government has continued to link hydrological data sharing by China with flood control and disaster mitigation, and it has acknowledged publicly that the data provided by China has been helpful to this end. Hydrological data sharing between

[26] *India-China Co-Operation*, Government of India, Ministry of Water Resources.

[27] "Summary of Press Briefing by the Official Spokesperson," Government of India, Ministry of External Affairs, 14 January 2002. See also *Memorandum of Understanding between the Ministry of Water Resources, the Republic of India and the Ministry of Water Resources, the People's Republic of China on Strengthening Cooperation on Trans-border Rivers*, Government of India, Ministry of External Affairs, 23 October 2013, hereafter 2013 MOU.

China and India has gone hand in hand with a more unilateral Indian approach to controlling floods: dam building.[28]

Despite India's intention to build its own dams to manage water flows, the number of dams actually being built still appears to be extremely limited. According to India's Water Resources Information System (WRIS), as of March 2015, only 16 dams have been constructed in the Brahmaputra basin, and some of these have yet to be completed.[29] Given the delays in completing dams as agreed upon (e.g., the dam on the Subansiri River), the depth of antidam movements in the northeast and broadly in India—with considerable support from international antidam NGOs—and the lack of adequate financing, it is unclear just how many dams India will actually complete on their portion of the Brahmaputra River and its tributaries.

Thus, the need to control flooding and soil erosion—along with the threat of China's dams and possible water diversion and India's need to establish user rights and consolidate a hold on territory—appears to be a key driver of India's activities in dealing with China regarding the Brahmaputra River.

INDIA-CHINA COOPERATION

Since the early 2000s, India-China relations concerning the Brahmaputra River have included new elements: dialogue *and* cooperation. Due to mistrust and disagreements over territorial boundaries, progress in relations has been limited. Nonetheless, the progress made encourages some hope for further cooperation. Under the 2002 MOU, China agreed to provide hydrological information, including water level, discharge, and rainfall amount from three stations (Nugesha, Yangcun, and Nuxia in Tibet) during

[28] See, for example, *In Response to Questions on a News Report on the Brahmaputra River Project in China*, Government of India, Ministry of External Affairs, 23 October 2006; and *Joint Declaration by the Republic of India and the People's Republic of China*, Government of India, Ministry of External Affairs, 21 November 2006. The 2006 India-China joint declaration noted that "the on-going provision of hydrological data for the Brahmaputra/Yarlung Tsangpo and the Sutlej/Langqen Tsangpo Rivers by the Chinese side to the Indian side has *proved valuable in flood forecasting and mitigation*," emphasis added. See "Govt Plans to Build Big Dams over Brahmaputra."
[29] "Dams in Brahmaputra Basin," India-WRIS, 27 March 2015.

the 1 June–15 October monsoon season.[30] India acknowledged that this information "was utilized in the formulation of flood forecasts by [the] Central Water Commission."[31] A 2005 MOU (renewed in 2010) expanded the data sharing to include the Sutlej River in India's northwest.[32] Therefore, the MOUs provide a vehicle to facilitate communication about the river.

Beyond the discussions surrounding the MOUs, China and India created new opportunities for specialists to work together. A 2006 joint declaration signed during the November visit of China's then-president Hu Jintao to India established an expert-level mechanism to discuss "emergency management" as well as "other issues regarding transboundary rivers."[33] Without providing specifics about how these mechanisms would be implemented, this declaration promised ongoing hydrological data sharing on the Brahmaputra (Yarlung Tsangpo) and Sutlej (Langqen Zangbo) and referenced the need to reach similar agreements on the Parlung Zangbo and Lohit/Zayu Qu rivers. India's acknowledgment that the data provided by China has been valuable for flood forecasting and mitigation may be designed to reassure India's domestic skeptics about the utility of this information but also to provide reassurance in India-China relations, suggesting that the utility of the agreements is as much political as practical in addressing flood forecasting.

Indian critics have dismissed data-sharing cooperation as useless at worst and limited at best, whereby "information had been exchanged but is not actionable because the data provides only volume of water figures and not from where or what time." Others claim that "we need regular infor-

[30] For a map of Chinese monitoring stations on the Yarlung Tsangpo (Nugesha, Yangcun and Nuxia), see figure 1 in He Chen, "Assessment of Hydrological Alterations from 1961 to 2000 in the Yarlung Zangbo River, Tibet," *Ecohydrology & Hydrobiology* 12, no. 2 (2012): 93–103, https://doi.org/10.2478/v10104-012-0009-z.

[31] A detailed list and explanation of the cooperative mechanism as of 19 September 2014 is available at Ministry of Water Resources, River Development and Ganga Rejuvenation, Central Water Commission.

[32] *Joint Statement of the Republic of India and the People's Republic of China*.

[33] *Joint Statement by the Republic of India and the People's Republic of China*.

mation, not on [an] annualized basis." Another felt India needs knowledge about "what spots the data comes from." Some critics dismissed water data sharing as useless in the absence of a water-sharing agreement.[34]

In any case, further cooperation on hydrological data sharing has been incremental and marginal. During Chinese premier Li Keqiang's May 2013 visit to India, the two sides agreed that China would provide data twice a day. Prime Minister Manmohan Singh's visit to China in October 2013 led to the more grandiosely titled *Memorandum of Understanding between the Ministry of Water Resources, the Republic of India and the Ministry of Water Resources, the People's Republic of China on Strengthening Cooperation on Transborder Rivers*.[35] But the only substantive new element was that China agreed to provide data starting on 15 May instead of 1 June—an extra two weeks of data coverage.[36]

India's press accounts have emphasized what Prime Minister Singh did not achieve in terms of cooperation—i.e., providing at least some insight into what would constitute more substantive cooperation from the perspective of India. Singh reportedly "sought a joint mechanism with China for better transparency on 39 project sites that Beijing has apparently identified on tributaries of the Yarlung Tsangpo (Brahmaputra), including seven on the main river." Moreover, "New Delhi had pressed for a joint mechanism because in the absence of a river water–sharing treaty between the two countries, such a mechanism will allow India to seek specific information about the upstream projects in China, their construction schedule, the likely impact on people, environment and downstream river flows."[37] Other media reports claimed that Prime Minister Singh sought a water

[34] CNA interviews, New Delhi, 2015.

[35] 2013 MOU.

[36] *List of Documents Signed during the State Visit of Chinese Premier Li Keqiang to India (May 19–22, 2013)*, Government of India, Ministry of External Affairs, 20 May 2013; and *2013 Implementation Plan: Provision of Hydrological Information on the Yarlung Zangbu/Brahmaputra River in Flood Season by China to India*, Embassy of India, Beijing, China, 30 June 2014.

[37] Wasbir Hussain, "MOU on the Brahmaputra River," Institute of Peace and Conflict Studies, #4149, 24 October 2013.

commission or intergovernmental dialogue to deal with water issues.[38] In the absence of reliable public information on what New Delhi proposed to Beijing through diplomatic channels, it seems clear that the government of India was keen to advance up the cooperation ladder but did not get very far, suggesting an ongoing gap between India and China on river management.

As evidence of the cooperation eked out between India and China, it was not until 2014, during the visit of India's vice president Hamid Ansari to China, that the two countries signed the *Implementation Plan: Provision of Hydrological Information on the Yarlung Zangbu/Brahmaputra River in Flood Season by China to India*.[39] This document is fascinating in several respects. Mainly, the agreement addresses issues about types of data and mechanisms for communicating information. First, it lays out in great detail the precise nature of information to be shared (to the decimal point), the mechanisms by which information is to be shared (including specific emails of respective officials), and related details of hydrological information sharing. Second, almost parenthetically, the document states: "The Chinese side also agrees to provide hydrological information if water levels of above-mentioned stations are close to or reach warning water levels in non-flood season." This appears to be the first publicly available mention of *nonflood season* (when water flow can fall too low) data sharing in an official document of the two countries. The clause about providing information in the case of stations reaching "warning water levels" also appears to address the vague references in the 2006 joint declaration to "emergency management."[40]

Third, the document lays out the terms and mode of payment, which is unusual, as the best publically available information indicates China does not charge Bangladesh to provide similar data. The cost to India for China's provision of the data is approximately 850,000 Yuan per year—or

[38] See, for example, "China Less Than Enthusiastic to Indian Proposal on Water Issue," *Economic Times*, 20 August 2013.
[39] *Implementation Plan.*
[40] *Implementation Plan.*

less than $134,000 per year at current exchange rates. A fourth interesting element of the implementation plan document is its articulation of *Indian* obligations beyond payment. Much of India's public and media narrative on river water issues with China has focused on the need for transparency from Beijing. This document notes that the "Indian side will provide the Chinese side information regarding data utilization in flood forecasting and mitigation" and that the "Indian side will also inform the Chinese side [of] the information of the hydrological station which lies on the mainstream of the Yarlung Zangbu/Brahmaputra River and is close to China's Nuxia station. The information includes [the] station's name, latitude and longitude, [and] type of data being observed."[41] The *mutual* transparency inherent in this implementation plan is intriguing because it both makes obligations mutual and runs counter to India's domestic debate, which focuses mostly on what China must do.

Finally, in an element that has received almost no media or public attention, the implementation plan permits the parties "after mutual consultation through diplomatic channels" to "dispatch hydrological experts to each other's country to conduct study tour[s] according to the principle of reciprocity." The purpose of this element is "to ensure normal provision of hydrological information."[42] All things considered, the implementation plan suggests a clear and established framework for data sharing on the Brahmaputra River. It is, however, not clear how the implementation plan is being executed. For example, there is no evidence that the data have in fact been shared per the agreement or that any study tours of hydrological experts have taken place. And, of course, hydrological data sharing does nothing to address transparency on such issues as mutual dam building, alleged Chinese interest in diverting the waters, or water sharing of the Brahmaputra River. These "big-ticket" items of riverine cooperation remain off the table for now, and there is little to suggest that they will be picked

[41] *Implementation Plan.*
[42] *Implementation Plan.*

up for action any time soon. Thus, while there is progress in cooperation, they are just baby steps.

Indeed, India-China cooperation on the Brahmaputra River seems to have reached its limit for the time being. Prime Minister Modi's May 2015 visit to China brought no new announcements for cooperation, though he specifically called for "tangible progress" on the issue and described it as an "irritant."[43] One can only speculate as to why no new agreements were signed (in contrast to the preceding decade, when several small steps were taken), but it seems likely that this first visit was seen by China as a "get to know you" event and Prime Minister Modi went to China emphasizing economic issues, including attracting investment to bolster his new "Make in India" manufacturing campaign.[44] A broader interpretation may be that cooperation on the Brahmaputra River, because it overlaps with the contested territorial issue, will be a painstaking and drawn-out process similar to India-China negotiations on the border and the territorial dispute itself.

The assessment of a Chinese specialist on the issue seems reasonable: "Since China still has border disputes with Bhutan and India, it is understandable that there would not be any substantial negotiations on the use and protection of transboundary waters before more vital and urgent border disputes are resolved."[45] For both China and India, then, the territorial dispute through which the river literally runs remains inextricably tied up with sharing information, not to mention the water of the river.

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[43] "Prime Minister's Media Statement during His Visit to China (May 15, 2015)," Government of India, Ministry of External Affairs, 15 May 2015.

[44] For more on this policy, see "National Manufacturing," Government of India, Make in India.

[45] Chen Huiping, "The 1997 UNWC and China's Treaty Practice on Transboundary Waters" (paper presented at the United Nations Watercourses Convention Global Symposium, University of Dundee, 10–14 June 2012), 21. This paper also draws on research from Patricia Wouters and Chen Huiping, "China's 'Soft-Path' to Transboundary Water Cooperation Examined in the Light of Two UN Global Water Conventions—Exploring the 'Chinese Way'," *Journal of Water Law* 22, no. 6 (2011): 229–47.

THE SUBNATIONAL FACTOR

India's perspectives and policies on the Brahmaputra River are also influenced by northeast India's increasing institutionalization in India's government structure, its higher political profile, and its growing role in India's international relations. Furthermore, India seeks to build dams to produce electricity as well as manage the flooding and soil erosion that affect livelihoods and development in its northeastern states. To date, however, India has built very few of its planned dams on the Brahmaputra and its tributaries. The growing weight of the northeast India subnational factor has fused with concerns about China's upstream activities and the salience of transboundary rivers in India-China relations.

Though the Brahmaputra River flows through only two of eight northeast Indian states—one of which is disputed territory with China—its drainage and catchment areas affect a wider portion of the region, including Arunachal Pradesh, Assam, Meghalaya, West Bengal, Nagaland, and Sikkim.[46] The Brahmaputra River is thus a socioeconomic resource but occasionally also a source of destructive floods, and is an isolated and underdeveloped Indian region. The region is essentially an "island" separate from India (Indian interlocutors often speak of India as the "mainland" versus the northeast) because it is connected to peninsular India only by the narrow Siliguri Corridor or "Chicken's Neck" and surrounded by Bangladesh or Myanmar.[47] Integrating the isolated northeast region into India's mainland is part of the larger state- and nation-building project. Even as India's government deals with differences regarding the Brahma-

[46] The drainage area is spread across Arunachal Pradesh (42 percent), Assam (33 percent), Meghalaya (6 percent), and Nagaland (6 percent). See Shirodkar, "Playing Chinese Checkers"; and "River Info: Brahmaputra River System," India-WRIS, 14 January 2016.

[47] Ankit Panda, "Geography's Curse: India's Vulnerable 'Chicken Neck'," *Diplomat*, 8 November 2013.

putra River with China, it has kept the northeast dimension of the issue in mind.[48]

The Department of Development of the North Eastern Region (NER) was established in 2001 and upgraded to a full ministry in 2004, "underscoring [India's] complete commitment to ensure development with equity for the NER to unleash the potential of its human and natural resources."[49] A part of this development involves the construction of dams as discussed above. Politically, the northeast has received more attention in the past decade because India's third-longest serving prime minister, Manmohan Singh (2004–14), had his upper house parliamentary constituency in Assam. In cooperation with the World Bank, Prime Minister Singh initiated an important study on the region's water resources, which was released in 2007. Furthermore, Prime Minister Singh emphasized the need to make northeast India a key part of the country's expanded ties to Southeast Asia as part of a Look East Policy. Prime Minister Modi continued this emphasis on developing India's northeast and linking development to ties with Southeast Asia.[50]

A key challenge for the central government of India is balancing the northeast region's persistent questioning of New Delhi's attention and response to China's activities, while addressing criticisms about the central government's dam building and other initiatives for the region.[51] Some Indian and Chinese analysts suggest that northeast Indian state governments exaggerate the dangers posed by China's plans on the upper Brahmaputra, while simultaneously complaining about India's approaches to handling flooding, drought, and erosion problems in the region because

[48] In June 2011, India's external affairs minister, S. M. Krishna, stated, "It is important that the States of Arunachal Pradesh and Assam of India harness and utilize the waters of the Brahmaputra. This is the really important issue." See *Reports of Construction of a Dam on Brahmaputra River by China*, Government of India, Ministry of External Affairs, 14 June 2011.

[49] *Background*, Government of India, Ministry of Development of North Eastern Region.

[50] *Development and Growth in Northeast India*; see, for example, Edmund Downie, "Narendra Modi's Northeast India Outreach," *Diplomat*, 14 December 2014; and Elizabeth Roche, "PM Modi Seeks Singapore's Investment to Develop the Northeast," *LiveMint*, 9 February 2015.

[51] For an informed view of northeast Indian perspectives, see Mirza Zulfiqur Rahman, "Dams on the Brahmaputra: Concerns in Northeast India," IPCS.org, #3245, 28 September 2010.

they seek to manipulate the central government to increase their leverage for project funding.[52] Last year, Assam's chief minister, Tarun Gogoi, of the Indian National Congress—a party in opposition to the central government led by the Bharatiya Janata Party (BJP)—complained about India's plans to build a new dam on the middle part of the Siang even as Indian officials explained that the purpose of the dam was to prevent flooding in Arunachal Pradesh and Assam.[53]

The lack of consensus between the two main Brahmaputra-bearing Indian states—Arunachal Pradesh and Assam—also complicates matters. Indeed, one Indian analyst explained that there is anxiety between Arunachal Pradesh, the upper riparian state, and Assam, the lower riparian state, due to their relative positions on the river. The latter worries primarily that the contemplated dam construction in Arunachal Pradesh will interrupt river flow downstream in Assam and that the seismic vulnerability of the state will lead to dam breakage and population displacement, among other dangers. More than one interlocutor in India reported that the water ministries of Arunachal Pradesh and Assam do not share river water data with each other, "so why complain about the PRC [People's Republic of China] not giving data when even state ministries don't talk."[54] In the mid-2000s, as part of India's policy of increasing the region's political institutionalization, a proposal called for establishing a Northeast Water Resources Authority to overcome state-level resistance to information sharing and cooperation. But, according to one leading Indian water expert and former government official, B. G. Verghese of the Centre for Policy Re-

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[52] For Chinese perceptions, see Liu Qin, "Indian Critics of Tibet's First Dam 'Exaggerating' Dangers: Chinese Experts Stress Cooperation over Competition as Solution to Water Disputes," *ChinaFile*, 4 December 2014.

[53] "Assam Opposes Centre Plan to Build Mega Dam on Siang River," *Times of India* (Mumbai), 5 June 2015.

[54] See B. G. Verghese, *Water Resources in the Northeast: Development Options in a Cooperative Framework*, Background Paper No. 1 (New Delhi: Centre for Policy Research, 2006). This was the first in a series of papers done to support the eventual study entitled *Development and Growth in Northeast India: The Natural Resources, Water, and Environment Nexus* (Washington, DC: World Bank, 2007).

search, Arunachal Pradesh preferred to deal bilaterally with lower riparian Assam.[55]

Apart from the two key state governments, citizen groups and various local and international NGOs have been highly critical of dam-building projects in the region for a range of environmental, cultural, and economic reasons. Jabin T. Jacob, director of the Institute for Chinese Studies, highlights the inadequate local labor supply, which would require the influx of labor from elsewhere in India and thereby add stress to a region "that is already the site of various forms of political instability, including ethnic insurgencies."[56]

Despite the dissonance between New Delhi and the northeast states, and their persistent need to work on center-state alignment, there is almost no evidence that northeast India is making new, non-India–centric alignments to influence outcomes. Northeast Indian states are not seeking or cutting deals even with neighboring Bangladesh, much less with China—though interactions between northeast Indian states and Bangladeshi officials do take place. The paucity of direct links between India's northeastern states and either China or Bangladesh means that multilateral cooperation on the Brahmaputra basin must be driven by national capitals rather than regional ones—though, at least in the Indian case, there must be some mechanism to involve or inform state-level governments about such efforts.

Northeast India's place in the dynamics of the Brahmaputra River remains both central and marginal. Physically, northeast India is where the

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[55] See Verghese, *Water Resources in the Northeast;* and *Development and Growth in Northeast India.*

[56] For example, research scholar Mirza Zulfiqur Rahman writes: "The huge number of big and small dams in Arunachal Pradesh has the potential to damage the rich biodiversity and ecosystem of the state considered to be one of the global biodiversity hotspots, result in huge displacement of people in Arunachal Pradesh and Assam, increase the risks of flash floods and environmental disasters in a particularly active seismic zone, and induce conditions for further conflict situations in the region. Many of these effects have already been seen, with some projects almost near completion, and the damage done in the past five years is starkly noticeable in the state." Rahman, "Dams on the Brahmaputra"; and Jabin T. Jacob, *Political Economy of Infrastructure Development in the Sino-Indian Border Areas*, China-India Brief No. 22 (Singapore: Centre on Asia and Globalization, Lee Kuan Yew School of Public Policy, 2014).

Brahmaputra River flows. Politically, northeast India is where the Brahmaputra River flows through contested terrain with China. And yet, while Delhi has included the key state governments in shaping its approaches to national policy, the role of the northeastern states is far less significant to driving India's Brahmaputra River policies than bilateral India-China relations and, to some extent, even India-Bangladesh relations. It is to the latter relationship that this chapter now turns.

INDIA-BANGLADESH RELATIONS

The physical, historical, and political interdependence of India and Bangladesh shapes bilateral relations, including those regarding the Brahmaputra River. India's northeastern states surround Bangladesh for approximately 2,500 miles, broken only by a stretch of roughly 200 miles along the southeast corner where Bangladesh and Burma share a border. If Bangladesh is "encircled" by India, India is "separated" by Bangladesh. India's northeastern states are essentially separated from peninsular India by Bangladesh—except for the narrow Siliguri Corridor. Historically, Bangladesh actually emerged from what is today India. It was first partitioned from the province of Bengal by the British in 1905 (reunited in 1911) and then split off as East Pakistan in 1947 at the time of British India's partitioning into independent India and Pakistan. Finally, East Pakistan became today's Bangladesh, when it was separated through secession from Pakistan and military intervention from India during the Indo-Pakistani War of 1971, also known as the Bangladesh War of Independence.[57] Against this background, India's relations with Bangladesh concerning the Brahmaputra are a subset of wider riparian relations conducted through the Joint Rivers Commission and specific agreements on the Ganges and Teesta Rivers.

This intricate linkage carries over into riverine relations. Most of Bangladesh's 57 major rivers originate in or flow through India. Upon entering Bangladesh, the Brahmaputra, for example, becomes the Jamuna River,

[57] This section is drawn from Nilanthi Samaranayake et al., *U.S.-India Security Burden-Sharing?: The Potential for Coordinated Capacity-Building in the Indian Ocean* (Alexandria, VA: CNA, 2013), 7–27.

which joins with the Ganges River (called Padma in Bangladesh), which in turn joins the Meghna River to flow into the Bay of Bengal. The intricate riverine relations between India and Bangladesh are similar to those between China and India on the Brahmaputra. However, India-Bangladesh relations are quite different and focus on three elements: cooperation on the Ganges River, waiting for implementation of an agreement on the Teesta River, and implications of India's river-linking project for Bangladesh.

COOPERATION ON THE GANGES RIVER

A 1996 water-sharing agreement on the Ganges River is seen in India as an example of their accommodative and cooperative behavior on riverine issues. Bangladeshis see India as less generous, often noting its use of the Farakka Barrage to divert water from the Ganges to flush the silt-heavy Hooghly River in Kolkata.[58] The Ganges River Treaty clearly does not solve all of the difficulties faced by lower riparian Bangladesh, but it is one of just three water-sharing agreements on major rivers in South Asia.[59]

WAITING ON THE TEESTA RIVER

A second India-Bangladesh water-sharing agreement on the Teesta River was reached in 2011 and awaits political approval for implementation. India's West Bengal chief minister has held up implementation due to political sensitivities in the state; India's constitution identifies water as a state-level issue, and therefore a chief minister is able to exercise such a role. Prime Minister Modi's June 2015 visit to Dhaka did nothing to move forward implementation of the Teesta Agreement. Both in India and in Bangladesh, however, optimism surges with the knowledge that the Teesta

[58] See Brahma Chellaney, "India Must Treat Water as a Strategic Resource, Fight China's Throttlehold," *Hindustan Times* (New Delhi), 28 November 2015; and Madeleine Lovell, "India, Bangladesh and the Farakka Barrage," Future Directions International, 10 May 2016. For Bangladesh's perspectives on the Brahmaputra, see the Bangladesh chapter for this project by Nilanthi Samaranayake.

[59] *Treaty between the Government of the People's Republic of Bangladesh and the Government of the Republic of India on Sharing of the Ganga/Ganges Waters at Farakka*, BD-IN, 12 December 1996, hereafter 1996 water treaty.

agreement will go forward in due course—though this might require further political alignment between New Delhi, Dhaka, and Kolkata (formerly Calcutta). Such political alignments—between the central government in New Delhi and the state of West Bengal (which includes Kolkata), and between these two jurisdictions and Dhaka, Bangladesh—are unpredictable and not necessarily decisive. For example, the Teesta agreement did not move forward during either Prime Minister Singh's or Prime Minister Modi's visits due to opposition from the state government in India's West Bengal state. However, politics between New Delhi, the state of West Bengal, and Dhaka were sufficiently aligned by the time of Prime Minister Modi's June 2015 visit to Bangladesh to allow for final ratification and implementation of an India-Bangladesh land boundary agreement.[60] In the absence of political alignments among the three key jurisdictions, the political prospects for settling outstanding riverine issues between New Delhi and Dhaka are not favorable.[61]

IMPLICATIONS OF INDIA'S RIVER-LINKING PROJECT FOR BANGLADESH

India's plan for a river-linking project (RLP) is a significant factor in India-Bangladesh relations regarding the Brahmaputra River. Variations of this project have been on the drawing board for centuries, since the days of British colonial rule. Two recent events brought new attention to the project: the 2012 Indian Supreme Court ruling calling for an acceleration of the plan's implementation, and the 2014 return to power of a BJP government regarded as favorable to the RLP project's implementation.[62]

While the RLP overwhelmingly deals with interlinking rivers *within* India, there are implications for transboundary flows. The precise impact on transboundary water flows appears to be a subject of significant debate

[60] *India and Bangladesh: Land Boundary Agreement* (New Delhi: Ministry of External Affairs, Government of India, 2015).

[61] For the current status of this water-sharing agreement, see Jayanta Basu, "India-Bangladesh Teesta Deal: River Has only One-sixteenth of Water Needed," *Business Standard*, 30 May 2017.

[62] For a recent overview, see G. Seetharaman, "Testing the Waters," *Economic Times Magazine Special Report*, 4–10 October 2015.

and rests in part on the technical as well as political decisions made in any implementation of such a project (map 2.3).

A technical study by the International Water Management Institute examines "the scope for linking the existing bilateral agreement between India and Bangladesh on sharing water from the Ganges River to an additional provision allowing for mutually beneficial water transfers from the Brahmaputra River."[63] Others are highly critical of such a project, saying that the "project will alter the natural flow of rivers, cause water-logging, hamper transportation of silt, affect fisheries, submerge forests and reduce water flow in transboundary rivers in downstream Bangladesh." From a legal standpoint, the critics contend that "by diverting water from the Ganga, India would break its formal promises to Bangladesh under the 1996 Ganga Water Treaty." In that treaty, Indian officials promised "that no water would be diverted away from the Ganga above the barrage at Farakka," which is only a few kilometers from the India-Bangladesh border.[64]

Whatever the impacts might be, the prospect for implementing the RLP in the near term in a way that would affect Bangladesh is widely regarded, both in India and in Bangladesh, as unrealistic for a host of technical, financial, and political reasons. Concerns about the RLP in India-Bangladesh relations are trumped by differences over the existing Ganges water-sharing agreement and implementing the completed Teesta agreement, as well as managing overall India-Bangladesh riverine relations through the Joint Rivers Commission.

Beyond these three priorities, India-Bangladesh cooperation is limited. Each recognizes its dependence on the other; India knows that transit rights through Bangladesh will boost development in India's northeast, and Bangladesh appreciates India's upper-riparian position. Such mutual

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[63] Anik Bhaduri and Edward Barbier, *Linking Rivers in the Ganges-Brahmaputra River Basin: Exploring the Transboundary Effects* (Colombo, Sri Lanka: International Water Management Institute, 2008).

[64] Juhi Chaudhary, "India Renews 'Disastrous' River-Linking Project," TheThirdPole.net, 20 November 2014.

Courtesy of Pete McPhail, based on data from "Manas-Sankosh-Tista-Ganga Link," India-WRIS; and Upali A. Amarasinghe and Bharat R. Sharma, ed., *Strategic Analysis of the National River-Linking Project (NRLP) of India: Proceedings of the Workshop on Analyses of Hydrological, Social and Ecological Issues of the NRLP* (New Delhi: International Water Management Institute, 2008)

Map 2.3. India's river-linking project, which includes the linking of the Brahmaputra River.

dependence, however, has led to only limited cooperation beyond directly bilateral issues and approaches. Based on interviews in India, interest in multilateralizing cooperation that would include Bangladesh appears very low. There is little evidence from interviews in India or Bangladesh, for example, that India is using cooperation with Bangladesh to pressure China. Bangladesh has its own concerns about China's planned activities on the upper reaches of the Brahmaputra and is engaged in discussions directly with Beijing on these issues.[65]

CONCLUSION: MULTILATERAL COOPERATION IN THE BRAHMAPUTRA BASIN

India's relations with China primarily shape its policies toward management of the Brahmaputra basin. India's domestic politics, specifically the public versus government debate and relations between the central government in New Delhi and the northeast state capitals through which the river runs, also influence India's management of basin issues. Bangladesh remains a comparatively minor factor in India's handling of Brahmaputra issues, even though river issues form a central aspect of the India-Bangladesh relationship.

India's specific concerns, such as issues with China, northeast India, and Bangladesh, are quite discrete and distinct. This complex set of interests creates quandaries for India, which sits between China and Bangladesh on the river. Hence, India pursues a variegated and limited set of cooperative activities regarding the basin.

India, however, does have opportunities with both China and Bangladesh to further modest cooperation by fully and finally implementing existing agreements and being more transparent about its own dam-building and RLP plans. In fact, because of the relatively measured and longer-term physical impacts of the river on India's population, industry, and agriculture, India has more space to experiment with innovative approaches to cooperation with its upper- and lower-riparian neighbors.

[65] For Bangladesh's perspectives on the Brahmaputra, see the Bangladesh chapter for this project by Nilanthi Samaranayake.

India's current emphasis on bilateral approaches to China and Bangladesh regarding the Brahmaputra does not rule out future multilateral cooperation, but India's middle-riparian position prevents effective multilateralism as a means to pursue its interests. India should introduce elements of ecosystem management and ecological protection into discussions of cooperation with China along the lines of the efforts between India and Bangladesh. There also may be room for the three countries to develop common research on preserving and monitoring Himalayan glaciers as part of the region's common heritage.

India currently takes a bilateral approach to the Brahmaputra River for several reasons. First, India mostly favors bilateral diplomacy with its neighbors, especially on sensitive issues. Second, India's main interlocutor and challenge on the Brahmaputra River—China—also emphasizes bilateral diplomacy. Third, India, as a middle-riparian country, has different concerns and interests regarding upper-riparian China and lower riparian Bangladesh that are likely better addressed bilaterally. It is unclear what benefits India would accrue from multilateralizing Brahmaputra River issues. Indeed, some Indians feel that a multilateral setting would allow Bangladesh to gain China's support for criticisms of India's river policies. Fourth, India already has bilateral water-sharing and hydrological information-sharing agreements with South Asian riverine neighbors and with China. Indeed, one former Indian government official recounted that India used the example of India-Pakistan riverine cooperation to make the case to China in the early 2000s to share hydrological data regarding the Brahmaputra River.[66]

India's current emphasis on bilateral approaches to Brahmaputra issues does not rule out future multilateral cooperation. India is a member of numerous organizations and arrangements that bring together countries with shared river waters, including the widest such organization relevant to the region—the SAARC. Improved relations across South Asia over time could theoretically create a mechanism along the lines of the MRC. But this

[66] CNA interviews, New Delhi, 2015.

seems like a distant prospect indeed, given the current poor state of intra-South Asia relations. An additional constraint is that the membership of these organizations and arrangements are not consistent with the three key Brahmaputra riparian states—China, India, and Bangladesh.

The closest organization in terms of membership and relevance to Brahmaputra River management is the BCIM Forum for Regional Cooperation. While Myanmar is not a Brahmaputra riparian, BCIM could theoretically address water issues. However, India remains quite cautious regarding BCIM and appears to want that organization to focus on land transportation connections for now rather than expand its agenda. There was little enthusiasm among Indian interlocutors to bring the Brahmaputra River issue to BCIM. In the absence of a Brahmaputra-specific arrangement, India and other riparian nations could create a trilateral, Brahmaputra River-only-organization. But such a major initiative seems some distance away because India does not seem interested. Multilateral cooperation on the Brahmaputra River does not elicit much support from India at the current time and is not likely to do so for the foreseeable future.

CHAPTER 3

BANGLADESH: THE STRONGEST ADVOCATE OF BASIN-WIDE MANAGEMENT

NILANTHI SAMARANAYAKE

INTRODUCTION

In the summer of 2017, Bangladesh faced another year of severe monsoon-season flooding. The most recent result of this frequent occurrence included damage to crops, railway tracks, and the homes of roughly 30,000 people. In particular, several of the country's districts saw flooding due to India's release of water at the barrage for the Teesta River, a tributary of the Brahmaputra River, that enters Bangladesh from India. As the lowest riparian geographically in the Brahmaputra basin, Bangladesh bears the brunt of extreme conditions in the basin from flooding to droughts. Because Bangladesh receives the majority of its river water from outside its borders—mostly from India—the country feels especially vulnerable, which heightens its overall threat perceptions. Many observers had hoped that progress would have been made by the time of this writing on the signing of a first-ever treaty in the Brahmaputra basin for the Teesta River under the Modi administration. Prime Minister Modi's indications of working toward signing the Teesta River accord included his public statements and discussions with the chief minister of India's West Bengal state, through which the Teesta runs before it enters Bangladesh. However, New Delhi has not yet signed this greatly sought treaty by Dhaka.

Without question, Bangladesh faces its greatest potential threat on the Brahmaputra River from activities by the two upper riparians—China and India. The country is at risk from the cumulative impacts of India's and China's self-interested river management, which shows little concern for

the downstream ecosystem. India's planned RLP, the failed 2011 Teesta River accord and uses of this Brahmaputra tributary not favorable to Bangladesh, and India's consumption of Ganges River resources and the resulting lower dry-season flows and salinity intrusion are all regarded by Bangladesh as a cautionary precedent for what may happen with the Brahmaputra. While Dhaka's fraught relations with New Delhi raise more complex and proximate concerns, China's dam building and lack of transparency also worry Bangladesh. Dhaka will need to address persistent bilateral water-sharing issues with its upper riparians, notwithstanding such mitigating factors as India and China sharing seasonal water flow and rainfall data to aid Bangladesh's flood forecasting as well as the reinvigoration of relations between India and Bangladesh under the Modi administration.

Given its difficult geographic position and capacity constraints, Bangladesh has a strong moral case upon which it can promote cooperative approaches for multilateral management and development of the Brahmaputra basin. Dhaka policy makers also can pursue this effort with New Delhi counterparts who may have more political space than the previous administration to pursue cooperation in the Brahmaputra River basin. This effort includes the 2016 election of a chief minister of the same party as Modi, the BJP, in the important Assam state, through which the Brahmaputra passes before it enters Bangladesh. Experts in both countries are also optimistic that the Teesta agreement will be signed at some point during the Modi administration. Within these conditions, Dhaka can call for action on the Brahmaputra from its bilateral relationships with China and India in a way that these countries cannot do with each other. Venues for cooperative water discussions include meetings of the BCIM Forum for Regional Cooperation and the Joint Study Group of the BCIM Economic Corridor. In addition to its moral authority in the Brahmaputra, Dhaka can appeal to its neighbors' economic interests because multilateral cooperation can help produce much-needed regional economic integration with beneficial results for all three countries. Because Bangladesh faces the greatest threat from the poor practices of upstream countries, it has the most to gain from improved river management and can serve as a catalyst for regional water

cooperation that could lay the foundation for an eventual "Brahmaputra Basin Commission."

Notably, however, while Bangladesh faces its greatest potential threat on the Brahmaputra River from upper-riparian activities, its most immediate threats stem from internal challenges. Factors such as climate change, plus the country's capacity constraints and dense population, exacerbate the effects of Brahmaputra riverbank erosion, flooding, and diminished dry season water flow and groundwater availability.

This chapter will consider the Brahmaputra basin from Bangladesh's perspective. It will begin with a domestic-level analysis by seeking to understand the predominant perceptions of internal challenges and threats in Bangladesh. The chapter will then move to a bilateral-level analysis with an examination of Bangladesh's perceptions of external threats from India and China. Finally, it will close by considering the potential opportunities for multilateral cooperation that exist despite current obstacles.

THE BRAHMAPUTRA IN BANGLADESH

Water is aptly characterized as "Bangladesh's blessing and curse."[1] Bangladesh gets too much water during the rainy season (June to October), resulting in flooding, and it gets too little water during the dry season (November to May), resulting in drought. Flooding and drought contribute to riverbank erosion, agricultural disruption, and migration. To give outsiders a sense of the landscape in Bangladesh, one water expert remarks that "the whole ecosystem of Bangladesh is water-based." The confluence of three major rivers (Brahmaputra, Ganges, and Meghna) occurs in Bangladesh. Roughly 90 percent of the river catchment for the country comes from outside its borders.

Although only 8 percent of the 580,000-square-kilometer basin area of the Brahmaputra is in Bangladesh, it serves as Bangladesh's largest water

[1] "Bangladesh," InternationalRivers.org; and CNA interviews, Dhaka, 2015.

system, followed by the Ganges, then the Meghna.[2] The Brahmaputra provides approximately 65 percent of the country's river water annually. Upon entering Bangladesh from India's Assam state, the Brahmaputra is called the Jamuna and travels along the boundaries of Rangpur, Mymensingh, Dhaka, and Rajshahi divisions (map 3.1).

After it leaves India, the Brahmaputra runs for nearly 250 kilometers (or about 150 miles) through Bangladesh, before connecting with the Ganges River, which empties into the Bay of Bengal through the Meghna River.[3] The Teesta River—which is a tributary of the Brahmaputra and the cause of a heated political dispute between Bangladesh and India—crosses the northern Rangpur division before it merges with the Brahmaputra. The Teesta River is significant because a water-sharing agreement was drafted but not signed in 2011, which would have been only the second water-sharing agreement between the two countries.

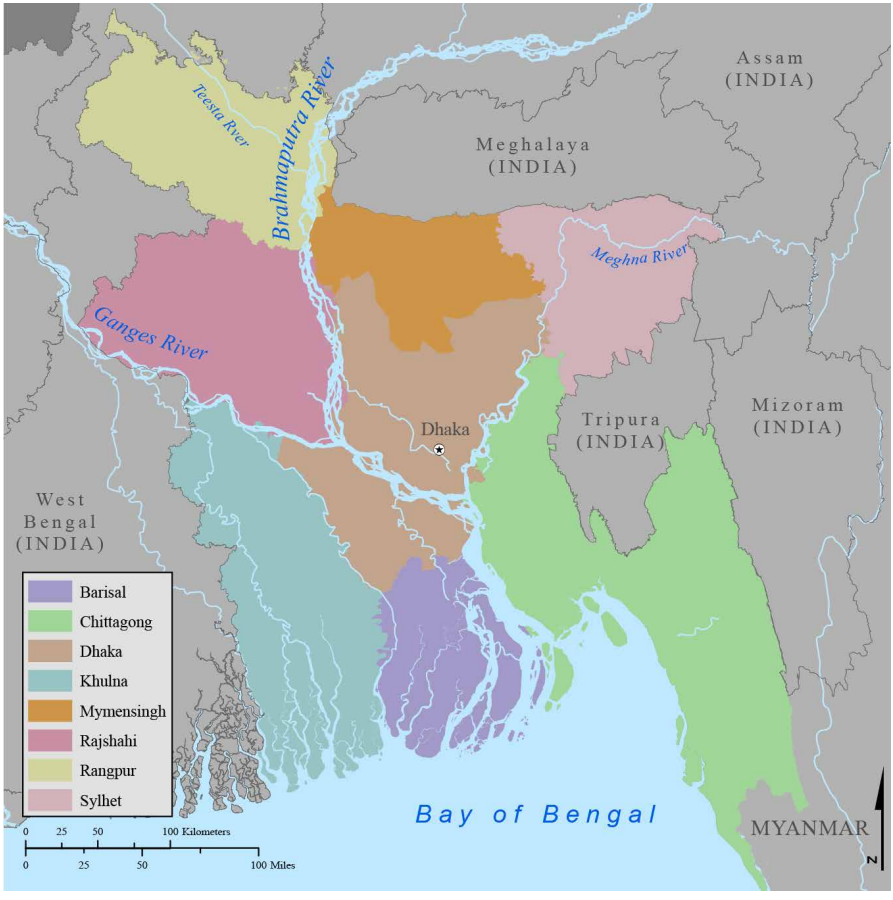
THE PRIMACY OF BANGLADESH'S INTERNAL CHALLENGES

While Bangladesh's greatest *potential* threat on the Brahmaputra River comes from activities by upper riparians India and China, the country's most immediate threats stem from internal challenges. Overall, Bangladesh is now more focused on the Ganges basin than on the Brahmaputra basin, due to India's consumption of water resources from the Ganges River and the downstream impacts that are evident in southwestern Bangladesh.[4] Nevertheless, the Brahmaputra is still an important source of concern, given the implications for the management of this resource that is Bangladesh's largest source for water. While much public discussion analyzes Dhaka's perceptions of

[2] "Brahmaputra Focus Area Strategy: 2013–2017," South Asia Water Initiative, 2015, http://www.worldbank.org/en/programs/sawi#4. The Brahmaputra is known as the Jamuna in Bangladesh. For consistency, this chapter uses the term *Brahmaputra* to identify the river throughout the basin. In India, the administrative level beneath national governance is the state, and in China it is the province. In Bangladesh, this level is called the division.

[3] The Ganges is known as the Padma in Bangladesh. For consistency, this chapter uses the term *Ganges* to identify the river throughout the basin.

[4] CNA interviews, Dhaka, 2015; and Price et al., *Attitudes to Water in South Asia*, 22, 24, 51.



Courtesy of Pete McPhail

Map 3.1. The Brahmaputra River basin in Bangladesh.

threats emanating from India and China on the Brahmaputra, internal challenges raise the most immediate problems for Dhaka to address. They include issues of erosion, flooding, and diminished resources during the dry season. The country's capacity constraints, dense population, and high dependence on external water sources exacerbate the effects of Brahmaputra riverbank erosion, flooding, and diminished dry season water flow and groundwater availability.

The Brahmaputra River, like many rivers, has moved over time, and in this case, the river's path has been changed by dramatic forces and enduring actions such as erosion. Bangladeshi water experts view the Brahmaputra as a young river that "has yet to take its shape."[5] There is a separate segment of the Brahmaputra in Bangladesh known as the Old Brahmaputra that was created when the river changed its course in the late eighteenth or early nineteenth century, likely due to an earthquake. Today, riverbank erosion is particularly stark along the Brahmaputra and is a modern reminder of the river's past and continually changing geography.[6]

Riverbank erosion not only changes the size and course of the river but hurts surrounding communities that are negatively affected by it. This process commonly occurs in the rainy season due to high water flows. In particular, land in the Kurigram and Gaibandha districts on the west bank and in Jamalpur on the east bank of the Brahmaputra is being lost as riverbanks collapse (map 3.2). Floods exacerbate this problem, having a significant impact on human security; for example, erosion renders an estimated 10,000–20,000 families homeless in Bangladesh every year. Many have had to rebuild their homes, in some cases multiple times, due to erosion.[7] Damaging people's homes, land, and livelihoods in Bangladesh, riverbank erosion on the Brahmaputra provokes local protest and disrupts families by forcing men to migrate to find work elsewhere in the country and thus

[5] CNA interviews, Dhaka, 2015.

[6] Richard F. Nyrop et al., *Area Handbook for Bangladesh*, DA Pam 550-175 (Washington, DC: Government Printing Office, 1975), 62. A study by Bangladesh's Center for Environmental and Geographic Information Services found the effect of riverbank erosion increased the Brahmaputra's width from 8.5 kilometers (km) in 1973 to 12.2 km in 2009. A measurement in October 2015 found that the river was roughly 15 km wide at the time. See Abu Bakar Siddique, "Historic Chilmari Port Disappears," *Dhaka (Bangladesh) Tribune*, 19 October 2013; and CNA interviews, Dhaka, 2015.

[7] Quamrul lslam Siddique, "Integrated Water Resource Management in the Ganges, Brahmaputra, and Meghna River Basins in South Asia: Prospects and Challenges" (conference paper, Policy Priorities for Sustainable Mountain Development, International Centre for Integrated Mountain Development, Nepal, 18–20 September 2006); Abu Bakar Siddique, "Bangladesh to Tame Brahmaputra with Concrete Embankments," TheThirdPole.net, 2 June 2015; and Abu Bakar Siddique, "Brahmaputra Erosion Hits People's Livelihood Hard," *Dhaka (Bangladesh) Tribune*, 25 October 2013.

Courtesy of CNA, adapted by Pete McPhail

Map 3.2. Brahmaputra in Bangladesh: the subnational view, by divisions and districts.

also disrupts local culture. Many go to Dhaka—the most densely populated city in the world—thereby intensifying national challenges.[8]

Riverbank erosion is caused by flooding, which in turn can cause additional problems. Bangladesh's inability to accurately forecast heavy floods

[8] See the following Kurigram story for a picture of a human chain protesting insufficient official attention to the preservation of Chilmari Port. Abdul Wahed, "Human Chain Held to Protect Chilmari Port from Erosion in Kurigram," *Kurigram News* (blog), 2 October 2010.

beyond three days in advance and its lack of water storage capacity have damaged or destroyed people's livelihoods and property. Reduced sanitation and educational resources are secondary impacts of flooding, especially in the *chars* (river islands). The Brahmaputra is the major cause of flood disasters in Bangladesh. In 2007, it reportedly overflowed its banks twice, killing 600 people and destroying crops in roughly 39 of Bangladesh's 64 districts.[9] As devastating as floods can be, they are not necessarily unwelcome in Bangladesh. Flooding provides much-needed replenishment of the soil—a process that benefits agriculture—but the poor infrastructure and forecasting turn the benefits of flooding into major liabilities.

In contrast to the problems brought by floodwaters in the wet seasons, Bangladeshis rely heavily on the Brahmaputra because of the problems that emerge during the dry seasons. Bangladesh, as a whole, sees wide pendulum swings from flooding to drought—all in the course of a year. The Brahmaputra is Bangladesh's largest source of water and provides about 75 percent of its total water resources in the dry season. After the Brahmaputra enters Bangladesh at Bahadurabad, the average monthly flow of the river during the rainy season (June to October) is 1.3 million cubic feet per second (cusecs). By contrast, during the dry season (November to May), the average monthly minimum flow is 157,000 cusecs; yet, Bangladesh requires about 210,000 cusecs from the Brahmaputra to meet its national flow requirements.[10] Thus, Bangladesh needs nearly all of the river's water in the dry season to fulfill its national water resource requirements, such as irrigation and flushing out salinity.

A critical requirement for the Brahmaputra in Bangladesh is pushing back the salinity that creeps up from the Bay of Bengal coastline. Essentially, decreases in Brahmaputra flow directly translate into increases in salinity. Whereas the Ganges increasingly fails to provide enough water to repel saltwater intrusion in southwest Bangladesh, at present, the southeast coastline of Bangladesh is protected due to freshwater supply from

[9] *Bangladesh: Precarious Lives of River Island Dwellers* (Geneva: IRIN Association, 2008).
[10] CNA is grateful to a government official for kindly providing this data, 2016.

the Brahmaputra. Yet Bangladesh sees the impact of the diminished flow of the Ganges on the salinity of the southwest coastline and worries about the negative implications of diminished flows of the Brahmaputra for the south-central and southeast coast.[11]

During the dry season, the Brahmaputra provides less water for domestic use, thereby hampering the ability of farmers to produce crops due to declines in groundwater. Rice is a water-dependent crop, and Boro rice is cultivated in the dry season, with 80 percent of it grown using groundwater irrigation. In terms of agriculture, the Brahmaputra is the main source of groundwater for Bangladesh during the dry season. Northwest Bangladesh already has a problem with declining groundwater levels because the Brahmaputra water is being extracted by tube wells at a rate faster than it is being recharged.[12] Despite adaptation activities by NGOs, farmers are not taking significant action to shift their crops away from rice cultivation, and they remain vulnerable to reduced groundwater availability in the dry season, which increases the threat of food insecurity for Bangladeshi citizens.[13] NGOs such as the Flood Hazard Research Centre (FHRC) have long been active in Bangladesh. Their representatives, including environmental scientists, try to help farmers adapt to the diminishing availability of groundwater by encouraging the growth of maize and sunflower, which consume one-fifth of the water and reap higher profits than rice, for example. National government policy does not appear to be incentivizing farmers to effect meaningful change in agricultural and irrigation practices.

Fisheries also depend mostly on groundwater in the dry season, but fishermen are seeing diminishing availability of this resource. A factor compounding this problem is the amount of arsenic that naturally occurs in the soil throughout Bangladesh; it is contaminating the dwindling supplies of

[11] CNA interviews, Dhaka, 2015.

[12] *Bangladesh: "Invisible Hazard" of Groundwater Depletion* (Geneva: IRIN Association, 2011).

[13] CNA interviews, Dhaka, 2015; and National Research Council, *Himalayan Glaciers*, 73.

groundwater and reducing water quality.[14] Another factor that hurts freshwater fish stocks in the low land and flood plains of the Brahmaputra basin is farmers' use of pesticides. Thus, because of naturally occurring and introduced toxic substances, as well as diminishing groundwater availability, Bangladeshi fishermen find it difficult to pursue their vocations and provide fresh food for domestic consumption and foreign export.

LOCAL CHALLENGES

Several factors exacerbate Bangladesh's difficult domestic situation. These factors are not specific to the Brahmaputra itself, but they form the context of vulnerability in Bangladesh's policy outlook. One set of stressors is Bangladesh's overall capacity constraints, which is important because it determines the country's ability to address national challenges. Another factor is the large population, which is a major stressor because it adds human pressures on the availability of water resources. Finally, a primary stressor comes from Bangladesh's adverse environmental conditions, such as low-lying geography, which tend to exacerbate the effects of the country's propensity to incur natural disasters. The country and its city centers are in the midst of dramatic changes due to rising economic and population growth, climate change, and the country's own capacity limitations.

Of the three riparian countries discussed in this book, Bangladesh is the most densely populated. In fact, it is one of the most densely populated countries in the world. Notwithstanding successful policies that have managed high rates of population growth since independence, Bangladesh's population of nearly 160 million people makes it the eighth most populated country in the world. More than 15 million people live in the capital, Dhaka, which is the densest urban area in the world with approxi-

[14] CNA interviews, Dhaka, 2015; and Sara V. Flanagan, Richard B. Johnston, and Yan Zheng, "Arsenic in Tube Well Water in Bangladesh: Health and Economic Impacts and Implications for Arsenic Mitigation," *Bulletin of the World Health Organization* 90, no. 11 (2012): https://doi.org/10.2471.BLT.11101253.

mately 112,700 people per square mile.[15] Clearly, rising populations require considerable water resources, especially in the context of environmental pressures. While a constellation of factors motivate people to migrate, Bangladesh has seen internal migration of many citizens to Dhaka and elsewhere in the country. Fishermen and farmers have lost their livelihoods due to water stress and salinity intrusion impacts in the southwestern part of the country (i.e., the Ganges basin) forcing them into the cities for wage work.[16] They often become day laborers and rickshaw drivers. Challenges regarding Brahmaputra water flows are likely to continue exacerbating overall population and migration trends in Bangladesh.

In addition to human pressures on resources, Bangladesh faces adverse environmental conditions. The country is prone to natural disasters, and climate change renders Bangladesh vulnerable due to its low-lying geography. Bangladesh is one of the "20 countries and regions most at risk" because of global climate change, and it is the only Asian country on the poorest segment of this list, according to the Intergovernmental Panel on Climate Change (IPCC), the top international authority on climate change.[17] Adding to these environmental impacts, the IPCC finds with "very high confidence" that climate change produces socioeconomic consequences; specifically, it tends to "further entrench poverty."[18] The IPCC also projects that as many as 27 million Bangladeshi citizens could be at risk from sea level rise due to climate change by 2050. While sea level rise is generally considered a serious threat facing Bangladesh, especially in the Ganges River basin and coastal areas, its impact will be magnified if the

[15] "Country Comparison: Population," *The World Factbook* (Washington, DC: CIA, 2017). Dhaka has a population of 15,669,000 and a density (people per square mile) of 112,700. Shane Croucher, "UN World Population Day 2015: These Are the 10 Most Densely Populated Cities on the Planet," *International Business Times*, 11 July 2015.

[16] David Michel and Ricky Passarelli, "Conflict Basins: Powderkegs to Peacepipes," *SAIS Review of International Affairs* 35, no. 1 (Winter–Spring 2015): 145, https://doi.org/10.1353/sais.2015.0009; and CNA interviews, Dhaka, 2015.

[17] IPCC, "Livelihoods and Poverty," in *Climate Change 2014: Impacts, Adaptation, and Vulnerability: Part A: Global and Sectoral Aspects*, ed. C. B. Field et al. (Cambridge: Cambridge University Press, 2014), 810.

[18] IPCC, *Climate Change* 2014, 810.

Brahmaputra's flows are reduced in the dry season and cannot help flush out salinity intrusion.[19] Thus, factors not directly related to the Brahmaputra are nevertheless exacerbating Bangladesh's challenges on the Brahmaputra River.

From internal social issues, such as population migration within the country to global threats such as climate change, Bangladesh faces obstacles that will impede its ability to address water-sharing challenges in the Brahmaputra basin. Despite a strong economic growth rate of roughly 6 percent annually, Bangladesh has the lowest gross domestic product (GDP) of the three riparian countries in this study. Although the World Bank elevated Bangladesh from a low-income to a lower-middle income country in mid-2015, it lacks sufficient water-management facilities (e.g., water storage in the dry season) and bureaucratic coherence to address its water problems. Considering how often floods occur and the country's flat terrain, Bangladesh needs better storage capacity solutions for excess water so that it can use the resource in the dry season. Even with regard to devising government policy on river resources, interagency coordination is reportedly difficult to achieve between such organizations as the Ministry of Water Resources, the Ministry of Shipping, the Bangladesh Inland Water Transport Authority, and the Power Division. These obstacles are not insurmountable, but Dhaka policy makers will need to navigate them in the pursuit of more effective management of Brahmaputra River resources within Bangladesh.

BANGLADESH'S COMPLEX BILATERAL RELATIONSHIP WITH INDIA AND IMPLICATIONS FOR THE BRAHMAPUTRA

At present, India represents the greatest threat to Bangladesh's water security due to its proposed RLP. But while this threat has neither materialized on the Brahmaputra nor is it imminent (particularly if Bangladesh can maintain the current upswing in bilateral ties and develop stronger multilateral nego-

[19] Susmita Dasgupta et al., *River Salinity and Climate Change: Evidence from Coastal Bangladesh*, WPS6817 (Washington, DC: World Bank Group, 2014), 4–5.

tiations in the future), any reductions in water quality and flow from India will affect Bangladesh, especially in the dry season, and with cumulative effects on the smaller nation. Last in line for the river's water, Bangladesh has the most to use as its primary user and views the two upper riparians—especially India—as problematic for its own water security, although the current upswing in bilateral relations with India under the Modi administration has mitigated some of Bangladesh's immediate fears. Sharing a history and a border with India has resulted in difficult bilateral ties due to disputes over territory, border crossings, and insurgencies. Bangladesh is surrounded by India on three sides, and its leaders perceive the nation to be vulnerable on water security in addition to other issues. Of the 57 rivers that enter Bangladesh, 54 come from India, leaving only 3 entering from Myanmar. There is a water-sharing agreement on only one—the Ganges River. A much-anticipated agreement on the Teesta and Feni rivers failed to be concluded at the last minute in 2011 due to domestic politics in India, leaving a bad impression among leaders in Dhaka and the wider Bangladeshi public. This outcome reinforced Bangladeshis' view of India as an overbearing "big brother" in terms of its overall disposition and water management practices.[20] Furthermore, the bilateral Joint Rivers Commission (JRC)—the only mechanism through which data sharing can be negotiated—has been criticized by one regional expert as being "in effect, two parallel national river commissions, instead of one joint commission."[21] Essentially, the JRC is seen as ineffective rather being an integrated commission comprised of Indians and Bangladeshis working together to devise solutions to water challenges.

Beyond water disagreements, Bangladesh has had a complex relationship with India, believing that India exerts excessive influence on Dhaka's policies due to its dominance in the region.[22] As a result, the politicization of issues involving India has a long history in Bangladesh. There is a common

[20] For more discussion of this sentiment, see Jaideep Mazumdar, "Why India Has to Re-Calibrate Its Neighbourhood Foreign Policy," *Swarajya*, 21 January 2018.

[21] Sundeep Waslekar, "India-Bangladesh Round Table on Blue Peace in the Eastern Himalayas, July 2013" (conference paper, Strategic Foresight Group, Mumbai, 1–2 July 2013).

[22] Nilanthi Samaranayake, *The Long Littoral Project: Bay of Bengal—A Maritime Perspective on Indo-Pacific Security* (Alexandria, VA: CNA, 2012), 29.

view that India represents the greatest threat to Bangladesh—more so than China—given Bangladesh's geography in relation to India. Particularly before the Modi administration entered office, Dhaka felt that India's Border Security Force was being heavy-handed toward Bangladeshi citizens when policing the porous border.

Difficult bilateral relations have often been exacerbated by polarized domestic politics in Bangladesh, which are often depicted through a lens of either *pro-India* leadership (i.e., Sheikh Hasina of the Awami League) or *anti-India* leadership (i.e., Khaleda Zia, former prime minister and current opposition leader of the Bangladesh Nationalist Party). In addition, even those whose disposition may not necessarily be anti-India harbor doubt about New Delhi's ability to influence the water policies of Indian states—the result of which works against Bangladesh's interests.

The strongest evidence to support this view is that in 2011 Indian prime minister Manmohan Singh went to Bangladesh to sign the proposed Teesta water-sharing agreement but was unable to do so because he had failed to secure support from West Bengal chief minister Mamata Banerjee. This event subsequently hurt bilateral relations, including greater economic cooperation. At the time, Dhaka linked the Teesta pact with progress on giving New Delhi long-sought full transit rights across Bangladesh so that India can access its landlocked northeastern states.

Against this larger context, coupled with the importance of water resources as an issue in Bangladesh, a lack of effective water cooperation was a major hindrance to improving bilateral relations in the final years of the Singh administration. Under Modi, the relationship has been reset to some degree; progress has been seen in areas outside water management, such as the conclusion of a historic land boundary agreement and progress in power cooperation. Still, Bangladesh has concerns about India's current management of water resources in view of downstream impacts and future plans. Specifically, three issues have largely contributed to Bangladesh's perceptions of India as a threat: India's RLP, the failed Teesta agreement and uses of the river that are not favorable to Bangladesh, and India's withdrawals from the Ganges River basin.

THREAT PERCEPTIONS

The prospect of India diverting rivers, specifically through its RLP, is what Bangladesh sees as the greatest potential threat to its own water security in the Brahmaputra. The RLP would increase India's internal water security by connecting rivers with surplus river flow to those with deficit flow to guarantee optimal movement of water within India. Bangladesh is far more concerned about the RLP than it is about the possibility of water diversion by China.[23] Specifically, Bangladeshi leaders fear that India's diversion of the Manas and Sankosh rivers in the Brahmaputra would mean the removal of resources from the basin to the Ganges basin. A strong consensus of scientists, NGO experts, and officials in Bangladesh believe that this project, if achieved, would be catastrophic to the country's water supply, the biodiversity of its already fragile ecosystem, and agriculture and fish stocks, while raising the potential for drought.

Even though India does not have immediate plans to implement the RLP in the Brahmaputra basin, the logistics of completing the RLP remain daunting given the sheer engineering feat that would be required to divert rivers on such a wide geographic scale. In the words of one Bangladeshi water expert, India's RLP represents a "Herculean task."[24] In addition to the sheer logistical challenge, domestic water politics in India are difficult because even states within India are at odds with each other. Thus, gaining support from all stakeholders within India would delay the full implementation of this project, therefore limiting the potential of immediate risk to Bangladesh's water security.

Despite the low likelihood of India carrying out the RLP in the Brahmaputra in the near future, the salience of this threat in Bangladesh is real. First, Bangladesh's often difficult relationship with India heightens this baseline sense of concern. Second, Dhaka believes that India has previously acted against Bangladesh's interests with regard to water supplied through

[23] CNA interviews, Dhaka, 2015.
[24] CNA interviews, Dhaka, 2015.

Indian barrages in the Ganges and Teesta rivers and may do so again under the RLP (see map 2.3).[25]

As of 2018, India has made little progress on this effort. In fact, the previous Indian National Congress Party government let the RLP stall because it was proposed under the previous BJP government. Bangladesh, however, sees the current BJP government as being more determined to pursue this project. In fact, some modest movement of the RLP under the Modi administration has occurred, albeit outside the Brahmaputra basin. In September 2015, the Godavari and the Krishna rivers were finally linked in Andhra Pradesh. Rivers in Madhya Pradesh and Uttar Pradesh are the next targets of the RLP. As a result, Bangladesh's concerns are high, and most respondents believe that India will eventually carry out the RLP.

Unlike the Indian RLP, which represents a potential threat, management of the Teesta River in India is of current concern to Bangladesh. The Teesta River, a tributary of the Brahmaputra, begins in India's Sikkim state, traverses West Bengal state, then flows across Rangpur division in Bangladesh and into the Brahmaputra. Out of the rivers that Bangladesh shares with India, the Teesta ranks high in importance due to its role in supplying water for rice grown by farmers. As noted earlier, Indian prime minister Singh could not sign the proposed Teesta water-sharing agreement during a visit to Dhaka in 2011, because he failed to secure support from West Bengal chief minister Banerjee. If signed and implemented, this would be only the second river water-sharing agreement between the countries.

Bangladesh sees West Bengal withholding large amounts of Teesta water through its Gazaldoba Barrage during the dry season for agricultural purposes. As a result, northwest Bangladesh has seen the detrimental impacts of reduced river flow on agriculture, fisheries, and boat travel in the Teesta region. Last year, Bangladesh received roughly 300 cusecs on the Teesta in the dry season, compared with 5,500 cusecs only a few years before. Observers claim that the area looks like a desert, with homes once

[25] For India's perspectives on the RLP, see the India chapter by Satu Limaye; and CNA interviews, Dhaka, 2015.

on the banks of the Teesta now on a sandbar.[26] For Teesta River stakeholders in Lalmonirhat District in Rangpur, the diminished flow of water in the dry season is already a major problem for farmers, who fault government agencies for the situation. Moreover, the reduced river flow has human security impacts on the role of women in Bangladeshi society and people's livelihoods in the dry season. Water carriers in Bangladesh tend to be female; when water is not readily available, girls will drop out of school to perform the task of bringing back water to the family. Even Sugata Bose, an Indian member of parliament from West Bengal's Jadavpur Constituency, acknowledges that the fundamental problem with the Teesta River is "a shortage of water . . . [and] having to share what is, in fact, a very scarce resource."[27] Such a contest for Teesta resources on both sides of the border illustrates the need to finalize an equitable water-sharing accord.

Bangladesh's experiences with India *outside* the Brahmaputra—i.e., India's use of water resources in the Ganges River basin—magnify its threat perceptions about what India could eventually do *inside* the Brahmaputra basin. The water treaty that the two countries reached in 1996 for the Ganges River basin was a major breakthrough for bilateral relations as their first water-sharing accord. Dhaka was greatly concerned about West Bengal's use of water for desilting the Hooghly River, which had an adverse impact on agriculture in Bangladesh. Given the importance of water for both countries, the treaty helped address a difficult situation at the time.[28]

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[26] Ataur Rahman, "Ensuring Proper River Flow is Essential to Ensure Better Functioning of the Blue Economy," *Market Pulse*, no. 102 (July 2015): 44; CNA interviews, Dhaka, 2015; and Shariful Islam, "Water Scarcity and Conflict: A Bangladesh Perspective," *Daily Star Forum* 5, no. 6 (June 2011).

[27] Åshild Kolås and Farzana Jahan, "Stakeholder Mapping and Analysis," in *Water Scarcity in Bangladesh: Transboundary Rivers, Conflict and Cooperation*, ed. Åshild Kolås et al. (Oslo: Peace Research Institute Oslo, 2013), 67. Water scarcity impacts gender advancement opportunities because females tend to be water carriers in Bangladesh. Paul Faeth and Erika Weinthal, "How Access to Clean Water Prevents Conflict," *Solutions Journal* 3, no. 1 (January 2012); and "FPRC Interview with Prof. Sugata Bose (Part-2)," interview by Mahendra Gaur, *Diplomatically Speaking*, video, 15:02, 3 January 2016.

[28] 1996 water treaty.

Despite the Ganges accord, India's consumption of shared river resources continues to cause deep concern in Bangladesh, with many faulting India for not living up to its treaty obligations. India's West Bengal state is seen as consuming the potential Ganges augmentation flows for itself, thereby not providing all the water it should under the treaty. Article VIII states the need to cooperate on finding a solution to the problem of augmenting dry season flows; yet, 20 years later, there has been little progress on this front. On balance, the goodwill created by the treaty persists, and the consensus view is that the monitoring regime of scientists from both countries is working well. Because of the agreements laid out in Article IX's clause about the principles of equity, fairness, and causing no harm, Bangladesh sees India's current actions as acting against the spirit of the treaty by providing less water through the Farakka Barrage in the dry season, increasing the likelihood of droughts across the border.[29]

In the years since signing the treaty in 1996, Bangladesh views the absence of flow guarantees and an arbitration clause as major shortcomings of the agreement. As discussed earlier, southwestern Bangladesh is facing a significant problem of salinity intrusion. Insufficient water levels from India do not allow the Ganges in Bangladesh to flush out the salinity that creeps in from the Bay of Bengal. Impacts are already being seen with threats to drinking water in Gopalganj, for example.[30] With no flow guarantee or arbitration clauses and doubts about New Delhi's ability to restrain

[29] 1996 water treaty; Kolås and Jahan, *Water Scarcity in Bangladesh*, 66–67; CNA interviews, Dhaka, 2015; Abu Bakar Siddique, "China to Give Brahmaputra Flow Data to Bangladesh," TheThirdPole.net, 20 May 2015; Mir Sajjad Hossain, "Ganges Water Treaty between Bangladesh and India, 1996 and Its Prospects for Sub-regional Cooperation" (presentation, Mekong River Commission Summit, April 2014), 44; and A. N. M. Muniruzzaman, "Water and Disaster Management in South Asia: Threats to Peace and Security," *South Asia Journal*, no. 12 (Winter 2015): 5–18.

[30] Hossain, "Ganges Water Treaty between Bangladesh and India, 1996," 44. A study by Bangladesh's Institute of Water Modelling (IWM) and the World Bank finds that freshwater supplies in coastal districts could drop significantly by 2050, affecting between 3–5 million people. Pantho Rahaman, "Rising Salinity Threatens Bangladesh's Coastal Communities: Experts," Reuters, 13 October 2015; and Mashura Shammi et al., "Investigation of Salinity Occurrences in Kumar-Madhumati River of Gopalganj District, Bangladesh," *Journal of Nature Science and Sustainable Technology* 6, no. 4 (2012): 311–12.

state water use activities, renewing the 30-year agreement that expires in 2026 will be difficult unless such fundamental issues are addressed. When discussing the future of the Brahmaputra, experts in Bangladesh thus see an unsettling precedent in the Ganges basin (map 3.3).

MITIGATING FACTORS

For all of Bangladesh's concerns, two factors mitigate its anxieties about current and potential threats from India: water cooperation with India and improved political relations. As discussed above, Bangladesh and India signed their only treaty on water sharing in 1996 over the Ganges. Even before this agreement, the two countries founded the JRC in 1972, soon after Bangladesh became independent. In more recent years, Bangladeshi and Indian representatives continue to meet and exchange information through the JRC. For example, the latest discussions about proportions of water resources sought in the Teesta River have occurred during the commission's meetings. Notwithstanding aforementioned criticisms of the JRC's effectiveness as a dialogue mechanism, an official in the Bangladeshi government emphasizes that there has been "a tremendous amount of goodwill between the countries" on the discussion of water issues.[31] In fact, in November 2015, India's water resources minister, Uma Bharati, hosted Bangladesh's minister of water resources, Anisul Islam Mahmud, who invited her to the next round of the JRC in Dhaka. During their meeting, Bharati stated that New Delhi actively seeks to finalize the Teesta accord, including by reaching out to West Bengal chief minister Mamata Banerjee.[32]

Regarding the Brahmaputra, one saving grace is that India does not use much of the water flow compared with use of the Ganges. Also, India cooperates on sharing flood forecasting data, which it provides to Bangladesh without charge. It shares water-level and rainfall data on the Brahmaputra from a few stations in its territory, and since 2010 it has agreed

[31] CNA interviews, Dhaka, 2015.

[32] "New Delhi Reassures Dhaka over Teesta Water-sharing Deal," bdnews24.com, 16 November 2015.

Adapted by Pete McPhail, based on data from Siddique, "Integrated Water Resource Management in the Ganges, Brahmaputra, and Meghna River Basins in South Asia"

Map 3.3. The Ganges River basin, Farakka Barrage, the Brahmaputra River basin, the Meghna River basin, and southwestern Bangladesh.

to share data twice a day during the monsoon season (June to October).[33] While this is a positive step, this data-sharing arrangement is simple; India notifies Bangladesh how much rain has fallen in particular catchment areas so that Bangladesh can calculate the time before the water will arrive. As a result, Bangladesh can now forecast floods accurately up to three (sometimes even five) days in advance. While data sharing can be expanded, these interactions on water resources are beneficial to bilateral relations.

[33] CNA interviews, Dhaka, 2015. There is some question about whether data are only provided once a day and from April to October, based on varying interview responses.

Progress in bilateral relations, especially under the Modi administration, helps mitigate some of Bangladesh's larger threat perceptions with regard to India. For example, in July 2014, the two countries saw their long-standing maritime boundary dispute resolved through the Permanent Court of Arbitration at The Hague. Then, Modi's visit to Bangladesh in June 2015 and the historic signing of the Land Boundary Accord, which had been delayed for decades, finally resolved the unsettled land border dispute. India is also trying to cultivate deeper, positive ties with Bangladesh through efforts such as selling electricity from Indian power plants and approving an additional $2 billion U.S. dollars of development financing in 2016. On the Bangladeshi side, the Sheikh Hasina administration is generally seen as favorable to working with India on common security interests, such as counterterrorism and intelligence cooperation.

As a result of these developments in bilateral relations, optimism remains high in Dhaka that the two neighbors will finally sign the Teesta accord. Bangladeshi and Indian experts hoped that the agreement would have been concluded by late 2016, after the West Bengal elections so that the agreement does not become a lightning rod during Banerjee's reelection campaign.[34] Furthermore, Bangladesh has been reassured that New Delhi is working with Banerjee to seek her concurrence on the accord. The momentum following the election of the Modi administration in 2014 is still strong even though the agreement has not been signed as of this writing. Finalization of the Teesta accord would be a notable indicator of how lasting this renewed foundation will be for closer Bangladesh-India ties.

BANGLADESH-CHINA: THE VIEW FROM BANGLADESH

While the geographical locations of both India and China have the ability to disrupt the flow of the Brahmaputra before it gets to Bangladesh, Bangladesh's bilateral relations with China are not as fraught as those with India. This situation is not surprising because India is Bangladesh's neighbor with territory surrounding much of its smaller neighbor and is the dominant

[34] CNA interviews, Dhaka and New Delhi, 2015.

power in the region. Because China does not have this geographic proximity and presence, Bangladesh's relations with China are comparatively more positive. In fact, these ties give Dhaka more economic and military options than relying solely on New Delhi.[35] For example, China is Bangladesh's largest supplier of military equipment and sold Bangladesh its first-ever submarines in 2016. New Delhi policy makers were not pleased with this development and are concerned more broadly about China's rising ties with South Asian neighbors. Yet India, by contrast, has not supplied Dhaka with military equipment since the early years after independence in 1971, according to data from the Stockholm International Peace Research Institute (SIPRI).[36]

THREAT PERCEPTIONS

Bangladesh sees China as less of a direct threat to water security than India because most of the Brahmaputra is sourced farther south, within Indian borders. Nevertheless, poor management of upstream water resources without regard to the ecosystem or potential diversion activities by China are seen in Bangladesh as harmful to the entire Brahmaputra basin. A recurring theme among experts and officials in Dhaka is that Bangladesh could face a worst-case scenario through the cumulative effect of India's current and feared activities and potential diversions, in addition to the potential harm caused by irresponsible upstream practices in China.[37] Any reductions in the flow or quality of water coming from India and China will adversely affect Bangladesh, especially in the dry season.

Officially, Beijing continues to assure Dhaka that it has no plans to divert the Brahmaputra. Bangladeshi officials asked their Chinese counterparts about this issue as recently as March 2015, and they were reassured that the dams are for the purpose of producing electricity. Moreover,

[35] Nilanthi Samaranayake, "China's Relations with the Smaller Countries of South Asia," *China and International Security: History, Strategy, and 21st Century Policy*, vol. 1, ed. Donovan C. Chau and Thomas M. Kane (Santa Barbara, CA: Praeger, 2014), 226–27.

[36] "Transfers of Major Conventional Weapons," "Deals with Deliveries or Orders Made for Year Range 1971 to 2014," and "Trend Indicator Value Tables (TIV) of Arms Exports to Bangladesh, 1971–2014," SIPRI Arms Transfers Database, generated on 24 January 2016.

[37] CNA interviews, Dhaka, 2015.

China is a cooperative partner with Bangladesh in the Brahmaputra even though the countries do not share a border. Although this approach seems to satisfy Bangladesh at the present time, China's activities elsewhere, such as assertiveness in the South China Sea, call into question its verbal commitments to stability. Beyond assurances, Bangladesh wants China to be more transparent about its long-term intentions and plans in the basin; lack of clarity causes distrust.[38] Interestingly, a strong consensus of strategic experts, water scientists, and officials in Bangladesh do not doubt China's ability to construct storage dams or divert water to other Chinese rivers, despite the technical difficulties associated with doing so (examined elsewhere in this book).

WATER COOPERATION WITH CHINA

While not a neighboring riparian, China shares flood-warning data with Bangladesh, as it does with India. Beijing charges New Delhi for this information, yet it does not charge Dhaka as a humanitarian gesture to a friendly country often stricken by disaster. Beijing agreed to share data in 2005 to reduce the potential threat from natural disasters in Bangladesh. In keeping with China's ostensible efforts to provide humanitarian assistance to Bangladesh, China also agreed to help Bangladesh dredge its riverbeds and provide capacity building in this area.[39]

In March 2015, Bangladesh updated cooperation with China through an MOU on data sharing on the Brahmaputra. China agreed to provide

[38] Siddique, "China to Give Brahmaputra Flow Data to Bangladesh." The implications of insufficient trust were seen in CNA's 2014 simulation on water security in South Asia. See Trentacoste et al., *Bone Dry and Flooding Soon*, 17–18.

[39] Excerpt from the 2010 joint statement: "The two sides agreed to carry out sustainable cooperation on hydrological data sharing and flood control of river Yarluzangbu/Brahmaputra, in view of its necessity to the disaster reduction in Bangladesh. The two sides agreed to strengthen cooperation on water resources management, hydrological data sharing, flood control and disaster reduction, based on the exchange of letters between the Ministries of Water Resources of the two countries in 2005. At the request of the Bangladesh side, the Chinese side agreed to provide assistance for dredging of riverbeds and for capacity building through training of personnel." See "Joint Statement Between the People's Republic of China and the People's Republic of Bangladesh," 22 March 2010.

water flow data from three measuring stations in Tibet once a day, via email, during the monsoon season months from June to October.[40] China also agreed to provide rainfall data. These data are shared exclusively for the purpose of flood forecasting, because the underlying intent is disaster prevention.[41] This MOU mirrors China's cooperation with India for the same purpose, which emerged after a flooding tragedy took place on the Brahmaputra in 2000 as discussed previously in the China and India chapters.

Although Bangladesh believed that China would begin the data sharing in June 2015, the data sharing had not begun at the time of our field research. A Bangladeshi official minimized the March 2015 MOU by reasserting that it is only an "understanding" with China rather than an "agreement."[42] From time to time, Bangladesh gets data from China but not as systematically as was sought in the MOU. Bangladesh is optimistic, however, that this process will be regularized soon. Nevertheless, this gray area in the understanding of the MOU demonstrates the need to go beyond MOU-level cooperation to formal agreements that would guarantee Bangladesh consistent access to Chinese water data.

BANGLADESH'S SUPPORT OF MULTILATERAL COOPERATION IN THE BRAHMAPUTRA BASIN

Of the three basin stakeholders, Bangladesh is the most interested in pursuing basin-wide cooperation. This is not surprising, as Bangladesh has the most to lose, given its lowest position in the basin and the large extent to which rivers shape the country's topography. As one of the leaders in creating the SAARC, Bangladesh is a strong proponent of multilateral approaches.

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[40] Siddique, "China to Give Brahmaputra Flow Data to Bangladesh"; and CNA interviews, Dhaka, 2015.

[41] Siddique, "China to Give Brahmaputra Flow Data to Bangladesh"; and CNA interviews, Dhaka, 2015.

[42] CNA interviews, Dhaka, 2015.

Water experts in Bangladesh generally advocate integrated river basin management (IRBM), a school of thought that has gained support in water security studies. The U.S. Water Partnership, launched by then-Secretary of State Hillary Clinton in 2012, features a definition of IRBM on its H2infO web portal from the Nature Conservancy: "The collaborative process of integrating the conservation, management, and development of water, land, and related resources across sectors within a given river basin. The purpose is to improve economic and social benefits derived from water resources in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems."[43] The Danube, for example, is cited as a river basin where stakeholders have committed to supporting the principles of IRBM. Bangladeshi experts and officials consistently report their desire to encourage this approach to basin management, given the Brahmaputra countries' own challenges and threat perceptions.

Bangladesh sees water cooperation as opening up greater possibilities for regional integration, such as through increased river navigation with India and hydroelectric power generation with India and China.[44] Bangladesh believes that its geographic location is key to achieving what is often referred in the region to as *connectivity,* meaning connecting mainland India with its landlocked northeastern states as well as promoting interactions between China and South Asia and between South Asia and Southeast Asia. As a result, a retired Bangladeshi official envisages the Brahmaputra as a "river of cooperation" to contrast the benefits of working together in the Brahmaputra with the more frequently heard narrative of river conflict and water wars.[45]

Regarding India, Bangladesh believes that trade and transportation opportunities can help improve Indian mainland connectivity to the coun-

[43] "River Management," H2infO.us; and *15 Years of Managing the Danube Basin* (Vienna: International Commission for the Protection of the Danube River, 2007).

[44] Tariq A. Karim, "Towards South Asian Regional Economic Integration: A Bangladeshi Perspective," *Huffington Post*, 30 September 2015. River navigation between Assam, India, and Bangladesh has a deep history, declining after the 1965 Indo-Pakistani War, which affected East Pakistan (now Bangladesh).

[45] CNA interviews, Dhaka, 2015.

try's northeast. Currently, most movement of goods and people occurs between a few land corridors. Modi's June 2015 summit to Bangladesh freed up another avenue by getting coastal shipping access to Chittagong and Mongla ports, whereas previously Indian ships needed to travel to Singapore or Colombo and transship goods instead of sailing directly to neighboring Bangladesh. Moreover, the possibility for transit from Kolkata to Guwahati through Bangladesh on the Brahmaputra is seen as presenting a mutually beneficial opportunity for cooperation. Bangladesh believes that it not only has the moral authority, as lowest riparian, but the diplomatic justification to promote basin-wide cooperation with India on the Brahmaputra.[46] Under the 2011 framework agreement between India and Bangladesh, India agreed under Article 2 to "common basin management of common rivers for mutual benefit." Because the two countries agreed to "provide necessary assistance to each other to enhance navigability and accessibility of river routes and ports," Bangladesh thinks it can draw on this bilateral agreement to encourage cooperation in the Brahmaputra basin.[47]

Like India, China prefers to work bilaterally. Bangladesh and China signed a 2010 joint statement whereby they "agreed to enhance transport links."[48] Road and rail transit were the two methods discussed, given the obvious continental distance, yet the full spectrum of connectivity entails navigation along the Brahmaputra. Opportunities for cooperating on hydropower generation also are worth exploring. For example, the two countries might draw on China's dam-building expertise to help Bangladesh address its need to store monsoon water for use in the dry season. Although this idea was not specifically suggested by Bangladeshi interview

[46] Trentacoste et al., *Bone Dry and Flooding Soon*; and CNA interviews, Dhaka, 2015.

[47] See *Framework Agreement on Cooperation for Development between India and Bangladesh*, Government of India, Ministry of External Affairs, 6 September 2011. Article 2 full text: "To enhance cooperation in sharing of the waters of common rivers, both Parties will explore the possibilities of common basin management of common rivers for mutual benefit. The Parties will cooperate in flood forecasting and control. They will cooperate and provide necessary assistance to each other to enhance navigability and accessibility of river routes and ports."

[48] *Joint Statement Between the People's Republic of China and the People's Republic of Bangladesh*, 22 March 2010. Excerpt: "The two sides agreed to enhance transport links and, in this connection, to continue to discuss the possibility of building road and rail links between the two countries."

respondents, they often expressed admiration for China's engineering and construction capabilities and may support such an idea if it were pursued cooperatively.[49]

Given the openings for basin-wide cooperation that Bangladesh feels it has with India and China separately, the BCIM Forum for Regional Cooperation offers an existing multilateral framework that Bangladesh could use to encourage the two upper riparians in the Brahmaputra basin to cooperate with each other. Bangladesh participates in various multilateral organizations and frameworks such as BCIM, SAARC, and the Bangladesh-Bhutan-India-Nepal (BBIN) initiative. They are all oriented toward development and regional integration. Bangladeshi interview respondents did not suggest BCIM as a framework for Brahmaputra cooperation, but this venue holds the most promise because—unlike SAARC and BBIN—Bangladesh, India, and China are all equal members.

Started by China in 1999 as the Kunming Initiative, named after the capital of China's southwestern Yunnan Province, to pursue regional connectivity and development, the Track 2 BCIM Forum for Regional Cooperation has progressed to gain Track 1 support for a BCIM Economic Corridor. The Joint Study Group (JSG) of the BCIM Economic Corridor is exploring the possibilities for regional integration, even listing the prospect for "cooperative undertakings" on "water resources [that] may be conserved, developed and tapped beneficially" and on "climate change challenges" in the minutes of the JSG's first meeting in 2013.[50] The JSG meetings have taken place so far in Bangladesh and China, and the most recent meeting took place in Kolkata, India, in April 2017. Despite India's and China's preference to work bilaterally, New Delhi remains formally committed to the BCIM Economic Corridor while Beijing continues to be an active proponent of BCIM.[51] Following discussions about China's BRI,

[49] CNA interviews, Dhaka, 2015.

[50] *Minutes of the First Meeting of the Joint Study Group of BCIM Economic Corridor*, Consulate General of India, Guangzhou, 18–19 December 2013.

[51] Patricia Uberoi, "Problems and Prospects of the BCIM Economic Corridor," *China Report* 52, no. 1 (2016): 30–31, https://doi.org/10.1177.00094455613868.

and how Beijing has subsumed BCIM under BRI, New Delhi appears to have leaned back from making active progress on BCIM. However, the fact that the JSG concluded their long-awaited meeting in April 2017 (originally intended for 2016) indicates that New Delhi maintains a commitment to the body and the prospect for the Economic Corridor—despite Beijing inadvertently decreasing BCIM's appeal for India. As a result, BCIM remains a venue in which Bangladesh should pursue water resource cooperation and connectivity efforts for the Brahmaputra basin. At the next JSG meeting to be held in Myanmar, Dhaka could use the opportunity to raise this issue.

The interactions arising from Bangladesh's bilateral efforts to encourage India and China to work for basin-wide development and cooperation in the Brahmaputra could lay the foundation for what Bangladeshi experts envision as a Brahmaputra Basin Organization, a Brahmaputra Commission, or a Brahmaputra River Basin Authority. This formal body would be the most ambitious means of managing and developing the Brahmaputra basin. It would involve including all riparians as equal parties, require regular interaction and communication, and specify a dispute-settlement mechanism. Dhaka policy makers and diplomats can draw on the model of the Permanent Indus Commission, the body created to implement the 1960 Indus Waters Treaty between India and Pakistan.[52] Before the situation in the Brahmaputra worsens, Dhaka, as the lowest of the three riparian capitals in the Brahmaputra basin, could launch a serious effort to encourage New Delhi and Beijing to consider forming a Brahmaputra Basin Commission.

Because two of the basin riparians are nuclear powers and have a border dispute, the creation of a formal commission could be a confidence-building measure that preserves communication and insulates water interactions from political-military crises. The Permanent Indus Commission between India and Pakistan is seen as having such utility, despite the multiple conflicts that

[52] CNA interviews, Dhaka, 2015; and *Himalayan Solutions: Co-operation and Security in River Basins* (Mumbai: Strategic Foresight Group, 2011), 30–33.

have broken out since the Indus Waters Treaty was signed in 1960.[53] Creating such an organization to facilitate basin-wide water sharing and development in the Brahmaputra would probably take at least a decade. Yet, Bangladesh is the most eager of the riparians to see basin-wide cooperation materialize in the Brahmaputra and believes it has the diplomatic justification and moral authority to encourage this course of action if it chooses.

CONCLUSION

Bangladesh clearly faces both internal and external challenges with regard to its national interests in the Brahmaputra basin. Threats to the country from India and China are well understood and will only grow in importance as these upper riparians build dams and alter the upstream ecology with adverse consequences for Bangladesh. Dhaka needs to address these challenges, certainly, but must also be proactive about addressing internal challenges. At present, Bangladesh's shortages from the Ganges River, as well as the Teesta River tributary of the Brahmaputra, capture the lion's share of public and official attention regarding the country's water security challenges. However, the Brahmaputra River basin needs to be more closely monitored to ensure that Bangladesh will be able to successfully manage the various issues (e.g., floods and droughts) associated with this river, which provides the country with its greatest source of water. Through concerted outreach to China and India to encourage discussion in multilateral venues, such as BCIM, and progress made at the bilateral level, Bangladesh may be able to lay the foundation for an eventual Brahmaputra Basin Commission.

[53] Treaty between the Government of India and the Government of Pakistan Concerning the Most Complete and Satisfactory Utilisation of the Waters of the Indus System of Rivers, IN-PK, 19 September 1960; and Jessica Troell and Erika Weinthal, "Harnessing Water Management for More Effective Peacebuilding: Lessons Learned," in *Water and Post-Conflict Peacebuilding*, ed. Erika Weinthal, Jessica Troell, and Mikiyasu Nakayama (London: Earthscan, 2014), 436.

CONCLUSION

While the key Brahmaputra River basin stakeholders—China, India, and Bangladesh—have taken modest steps at the bilateral level to cooperate in the Brahmaputra basin (e.g., limited water data sharing and government dialogues between technical experts), clearly they are not ready to sign a trilateral or even bilateral water-sharing agreement or basin-development accord for the foreseeable future. Fostering water security is a long-game effort, so this is not necessarily a surprising or pessimistic finding. The fact that neither interstate relations nor the water security situation in the basin is in crisis allows China, India, and Bangladesh to proceed with cooperation at a measured rather than crisis-management pace.

Yet circumstances in the basin continue to change, as do threat perceptions between riparians. Since the publication of our report, upon which this book is based, some developments affecting the security of the Brahmaputra basin have taken place. This includes China's announced diversion of a tributary on a temporary basis for dam construction and its halting of hydrological data supplied to India for flood-forecasting purposes after the bilateral standoff involving Bhutan.[1] Meanwhile, Bangladesh again suffered severe flooding, including of the Teesta River sources shared with India. Neither country has concluded the Teesta accord as was expected by this point.

[1] For further reading about the diversion, see Limaye, Wuthnow, and Samaranayake, "China and India's Slow-Moving Path to 'Water Wars'."

Indeed, seen from a structural vantage point, the intensity of implications for population, territory, and industrial and agricultural development increase the farther south one moves from the origins of the Brahmaputra River in southern Tibet to the Bay of Bengal. The portions of the Brahmaputra that run through China and India are among the least populated, developed, industrialized, and farmed areas of their vast countries. It is really only in Bangladesh that the combination of population density and industrial as well as agricultural activity depends the most upon the Brahmaputra, and even in Bangladesh's case, the implications of river management on the Ganges and Teesta may be more immediately relevant than what is happening regarding the Brahmaputra. If the *physical* relevance of the river is greatest for Bangladesh, the *political* relevance is sharpest for China and India.

Over time, there are steps that India, China, and Bangladesh could take at the subnational, bilateral, and multilateral levels to lay the groundwork for the three countries to work together to advance security in the Brahmaputra River basin. Beginning cooperative efforts on water resources (e.g., through bilateral accords, trilateral consultations, and even a multilateral MOU) could pave the way for a new entity—possibly a Brahmaputra Basin Commission—through which a water management and development accord could be designed and implemented. The appendix presents practical recommendations for how all three countries can begin to work together bilaterally and multilaterally, as well as improve their domestic management of Brahmaputra resources. These policy options are organized by country within these three levels of analysis for ease of reading. A final section acknowledges the important role for the international community (i.e., international financial institutions and extraregional countries with capacity-building arms) to play.

Advocating cooperation solely for the narrow aims of water-sharing rights does not appeal to upper riparians. More promising is an appeal to the shared interests of these countries for the development of the river basin and greater regional economic integration. This connectivity could facilitate the expansion of transport and infrastructure options, such as

river navigation networks and joint hydropower projects. Instead of a river of contention or uncertainty, the Brahmaputra could become a river of cooperation for its stakeholders as the region continues to develop and grow.

For future researchers of the Brahmaputra River basin, there is much ground to cover. The literature begs for more contributions from both the scientific and security studies communities. Regarding the latter, an issue we faced during our work was that we continually had to approach our work on the Brahmaputra region in an integrated manner. For the study of the international relations of Asia, analysts often divide themselves into scholars of East Asia or South Asia due to the sheer size of the continent, yet the geography and security dynamics of the Brahmaputra basin do not lend themselves to this type of distinction. Going forward, analysts will need to approach this complex basin with greater attention to the bilateral and subnational linkages between the actors in this Asian subregion. More scientific study of the Brahmaputra basin is required to develop a deeper understanding of the long-term implications of current environmental conditions, such as recurring flooding. Most importantly, these scientific findings and implications need to be effectively communicated to nonscientist, government officials working on developing policy in each of the Brahmaputra basin countries.

APPENDIX

RECOMMENDATIONS: DOMESTIC LEVEL

CHINA

China should expand access to information regarding its dam construction plans on the Brahmaputra. There are a number of steps China can take, both on its own and in cooperation with India and Bangladesh, to improve trust and help to address common challenges related to the Brahmaputra. Despite China's assurances that its planned hydroelectric dams on the Brahmaputra will pose no risks to downstream countries, the Chinese government has placed relatively little information about these facilities in the public domain. The data available are somewhat difficult to locate and are often not published in English.[1] China should consider ways in which it can further reduce misperceptions about the goals behind its dam-building activities, such as releasing more detailed information about the planned dams or inviting specialists from downstream countries to visit the sites. It is also reasonable for China to expect that its co-riparians will similarly offer increased public access to data on their own development plans should collaboration activities be offered.

[1] For instance, China's 12th five-year energy plan merely states the names of planned hydroelectric dams, without providing timelines, technical details, or other relevant information. See *12th Five Year Plan Energy Development Plan*.

INDIA

The government of India should continue efforts to enhance coordinated hydrological data sharing between the center of India, New Delhi, and northeast India state governments. This option should also be available between the state governments in order to monitor upstream and downstream impacts on the Brahmaputra River. Further, the Indian government should consider how to improve consultation with northeast Indian state governments on the implementation of major dam-construction projects in the region. This would be important given center-state and civil society differences that constrain completion of projects.

India's central government and northeast Indian state governments should also cooperate on the production of a clear, updated, and comprehensive report on India-China relations regarding the Brahmaputra River. This report could incorporate northeast Indian views of concerns posed by China's actions as well as how recent dialogue and hydrological information sharing addresses these concerns.

The Indian government and the state governments of the northeast should consider how they might better cooperate on ecosystem management and ecological protection initiatives. India could develop these initiatives with China and Bangladesh.

BANGLADESH

Bangladesh should include more stakeholders in its national water-management policies as they apply to the Brahmaputra basin, yet aim for coordination. First, Dhaka should make a greater attempt to bring in all relevant domestic stakeholders—such as those living along the banks of the Brahmaputra—when making policies for this basin. Seeking community-based participation will be key to improving the effectiveness of water-management policy subnationally.[2] Dhaka recognizes that Bangladesh needs to encourage greater adaptation to agriculture that uses less water resources; policy makers should create more incentives for farmers to achieve this outcome. Dhaka also should

[2] CNA interviews, Dhaka, 2015.

explore more options for the storage of excess monsoon rainwater and more sustainable use of groundwater in the dry season. Finally, Dhaka should increase coordination of stakeholders, especially between all Brahmaputra-relevant government organizations, such as the Ministry of Water Resources; Ministry of Agriculture; Ministry of Environment and Forest; Ministry of Shipping; the Inland Water Transport Authority; the Ministry of Local Government, Rural Development and Co-operatives; the Local Government Engineering Department; and the Power Division. The issues related to the Brahmaputra are varied and require the participation of multiple ministries. Connecting all interagency stakeholders will be an important step in thinking strategically about the river basin and the potential crises that could emerge if Dhaka continues to give most of its attention to the Ganges basin and focus on the day-to-day problems of the Brahmaputra basin rather than the bigger picture.

Bangladesh should seek assistance from the international community to conduct evidence-based assessments of human security impacts in the Brahmaputra basin. For example, in-country observers often assert that Bangladeshi citizens are forced to migrate due to Brahmaputra erosion or that millions of citizens will be affected by sea level rise impacting the country. The International Organization for Migration concluded that insufficient data-collection efforts have prevented a complete, evidence-based assessment of permanent and cross-border migration in Bangladesh, especially as a result of climate change.[3]

Bangladesh is already heavily invested in tools that will directly help improve its ability to address water issues, such as flood-forecasting capabilities. Yet, Dhaka could use assistance with the collection of evidence that systematically documents the human security problems that Bangladesh faces on the Brahmaputra, including how they may be exacerbated by climate change. Extraregional countries that have previously funded efforts covering the Brahmaputra basin (e.g., the United Kingdom and the Netherlands) or international financial institutions would be ideal sponsors of these impor-

[3] *Assessing the Evidence: Environment, Climate Change and Migration in Bangladesh* (Dhaka: International Organization for Migration, 2010), 19, 29.

tant studies. Dhaka would find the results of this analysis useful for more informed domestic planning in this basin, as well as for making a more convincing argument to upper riparians India and China about the importance of sustainable, basin-wide practices in the Brahmaputra.

RECOMMENDATIONS: BILATERAL LEVEL

CHINA

China should consider hydropower as a potential area of cooperation with India. China and India are both considering plans to expand hydropower development along the Brahmaputra. Although this has become a source of tension on both sides, there may also be ways in which such development can be mutually beneficial.

At a minimum, the two sides should exchange information on how hydropower supports their respective development strategies and what their long-term intentions are with regard to development of the Brahmaputra. China and India should also explore the feasibility of cooperative activities, such as joint hydropower development and cross-border electricity trade.[4] These discussions could occur on an ad hoc basis or on the sidelines of existing development forums, such as the BCIM Forum for Regional Cooperation or the Trans-Himalayan Development Forum. A Track 2 initiative involves nongovernment officials such as academics and think tank experts. For this particular Track 2 initiative, the China Institutes of Contemporary International Relations sponsored it, with partner institutions from Bangladesh, India, and other South Asian countries.[5]

China should consider ways to enhance sharing of hydrological data with India. China currently provides India with hydrological data on the Brahmaputra during the flood season. To improve flood forecasting, China should consider offering real-time, year-round river flow data to India. Mean-

[4] Michael Pollitt, "Power Pools: How Cross-Border Trade in Electricity Can Help Meet Development Goals," *Trade Post* (blog), World Bank, 1 October 2014.

[5] Li Xinyi, "Conference Opens on Himalayan Issues," *China Daily* (Beijing), 24 August 2015.

while, as a gesture of goodwill, India should consider offering reciprocal hydrological data to China.

China should expand humanitarian and ecological cooperation related to the Brahmaputra with India. There appears to be room for China and India to expand cooperation in the management of humanitarian and ecological issues related to the Brahmaputra. While such cooperation will not eliminate underlying tensions, it might improve trust at a low level while addressing practical challenges. To this end, the Chinese and Indian water resource ministries should hold a regular dialogue on river management. This might include working groups on such topics as pollution control, biodiversity protection, dam safety, flood prevention, and emergency response.[6] These discussions also might cover lessons learned from other river basins, which could involve contributions from third-party specialists. Where possible, these working groups should make recommendations to their respective governments on steps that can be taken unilaterally or bilaterally to reduce risks and improve safety.

INDIA

India should move ahead with China on the exchange of hydrological information sharing for the Yarlung Tsangpo and Lohit/Zayu Qu rivers as called for in the 2006 joint declaration between the two countries. To date, exchange of hydrological information on these two additional rivers does not appear to have taken place.

India's government should consider issuing a clear, updated, and comprehensive report on India-China relations regarding the Brahmaputra River. Such a report could dispel misunderstanding, incomplete information, and speculation on the current state of India-China riverine relations.

India should clarify its plan for the construction of dams on the Brahmaputra River and its tributaries. When asked how many dams it plans to build, India gives only a range of figures. As it seeks clarification on China's plans

[6] China and India have already agreed to conduct working-level groups on hydrological data and emergency measures, but it is unclear whether or how often these groups actually meet.

for dam construction and their potential impacts, India should be willing to provide reciprocal information about its own plans.

India should move expeditiously to provide China with information as called for under the bilateral *Implementation Plan: Provision of Hydrological Information on the Yarlung Tsangpo/Brahmaputra River in Flood Season by China to India*.[7] India should provide China with information about its monitoring site on the Brahmaputra River as called for under the agreement.

India's central government should continue to try and implement the Teesta River agreement with Bangladesh as quickly as possible by working closely with the West Bengal state government. While the alignment of central and state governments must result from elections and not from political engineering, pressing for implementation of the Teesta deal would go a considerable way toward building on recent progress in India-Bangladesh relations.

India's government should clarify plans for the RLP as they apply to impacts on Bangladesh. Though there is little prospect for the RLP being implemented in the near term, India should consider providing further information to Bangladesh on plans for this initiative in light of the recent Supreme Court ruling and the intentions of the new BJP-led government.

BANGLADESH

Bangladesh should seek water-flow and rainfall data from India and China year-round, not only in monsoon season, and request site visits to dams and barrages in both upper riparians. The current purpose of the data sharing is to enable flood forecasting to avert disasters downstream. However, Bangladesh would benefit from dry-season and historical data from India and China as well, because this information would enhance Dhaka's planning and forecasting ability in general. Dhaka should request site visits to dams and barrages upstream on the Brahmaputra and its tributaries to encourage transparency and increase technical capacity for scientists in Bangladesh who seek to expand their understanding of sedimentation and its effects. They also want to better understand the positive use of dams and barrages to control

[7] *Implementation Plan*.

sedimentation. Given the sensitivities of water data and infrastructure, agreeing to such requests for data sharing and site visits would be a gesture of goodwill by India and China, which they can then highlight to enhance their own international reputations.

Bangladesh should seek greater cooperation with India on river navigation in the Brahmaputra. Due to their shared interest in increasing regional integration and connectivity, Bangladesh and India agreed to a joint goal of basin-wide management and development in their 2011 framework agreement.[8] Dhaka could elevate requests relating to the Brahmaputra basin—regarding its development and navigability in particular—from the JRC to the foreign minister level, given that the framework agreement was signed by both heads of government.[9]

Bangladesh should continue to seek to finalize the Teesta water-sharing accord with India. Many expect that the chances for the accord's conclusion are improving. Nevertheless, assuming that the Modi administration does eventually sign the accord, disputes may emerge as they have over the Ganges treaty. Dhaka and New Delhi should work to ensure that these disputes do not fester and potentially damage the wider bilateral relationship; including a dispute resolution mechanism also would be helpful.

Bangladesh should formalize its 2015 MOU with China to ensure the consistent provision of water data and to encourage Beijing to improve transparency with India for the benefit of other multilateral issues. From time to time, Bangladesh gets water-flow and rainfall data from China but not as consistently as was agreed to in the 2015 MOU. In addition to formalizing the MOU, Dhaka should encourage Beijing to participate in multilateral dialogues with

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[8] *Framework Agreement on Cooperation for Development between India and Bangladesh*.

[9] India's Ministry of External Affairs (i.e., foreign ministry) also has displayed interest in river transit through its funding of the Kaladan multimodal transport project, which ironically began as a way to avoid Bangladeshi territory when connecting the Indian mainland to the northeast. Under this project, people and goods could transit between Kolkata in West Bengal state across the Bay of Bengal to Sittwe, Myanmar, and then use the Kaladan River to transit into India's state of Mizoram. See Anasua Basu Ray Chaudhary and Pratnashree Basu, *Proximity to Connectivity: India and Its Eastern and Southeastern Neighbours*, Part 2, *India-Myanmar Connectivity: Possibilities and Challenges* (Kolkata: Observer Research Foundation, 2015).

India. At present, China assures Bangladesh of its goodwill regarding water security, but Bangladesh could impress upon China that BCIM—an idea that began in China and is still actively supported by Beijing—will have a greater chance of success when India gains more confidence in China's intentions in the region.

RECOMMENDATIONS: BASIN-WIDE LEVEL

CHINA

China should convene a Track 2 dialogue with India and Bangladesh to discuss shared water challenges.

Despite the lack of institutionalized cooperation at a basin-wide level, there may be avenues for increased engagement among all three riparians. A starting point would be the establishment of an annual Track 2 dialogue with participation from university and think tank scholars from China, India, and Bangladesh. While there are many promising topics for discussion, one possibility would be to limit the focus initially to technical and scientific subjects, such as the effects of climate change on river flow and potential mitigation strategies. Such talks could also involve input from international specialists on a case-by-case basis. Over time, these Track 2 interactions might form the basis for cooperation at the Track 1 level. As policy makers become interested in the findings of Track 2 dialogues, they may request to turn these interactions into Track 1.5 dialogues. These types of interactions are a hybrid of Track 1, which are government-to-government discussions, and Track 2, which are meetings outside official lanes (e.g., between academics and think tank experts). Technical and scientific interactions through Track 1.5 channels could lay the groundwork for the establishment of Track 1 meetings between diplomats.

INDIA

India should introduce the elements of ecosystem management and ecological protection into discussions of cooperation with China, along the lines of the efforts between India and Bangladesh. Over time, India, China,

and Bangladesh should consider how these efforts could be linked across the basin.

India should also consider how existing basin-wide mechanisms, such as the BCIM forum, could facilitate development of common research and action on preserving and monitoring Himalayan glaciers as part of the region's common heritage. India apparently has been successful in citing India-Pakistan and India-Bangladesh riparian cooperation in pursuing dialogue and data sharing with China. As confidence and habits of cooperation are developed, opportunities for multilateral discussions should be explored, including through official and unofficial dialogues.

BANGLADESH

Bangladesh should encourage dialogue with India and China on basin-wide management of the Brahmaputra. Bangladesh understands that a paradigm shift will be needed regarding perceptions of water resources in the Brahmaputra basin. The traditional, zero-sum view of water as a scarce resource that nations consume internally—and should therefore withhold from neighbors—is gradually losing credibility in other basins, such as the Danube and Rhine. Instead, "non-consumptive views" are emerging where water is seen as a shared resource that is worth investment for developmental and connectivity benefits to the entire region.[10] Dhaka wants to promote this line of thinking in the Brahmaputra basin and to encourage discussion of non-consumptive uses of water resources, such as the potential for greater river navigation and downriver trade, in a region that is not well integrated.[11] Furthermore, discussion that emphasizes shared interests, such as biodiversity of the river, will minimize the current mind-set focused on solely consumptive uses of Brahmaputra resources.

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[10] CNA interviews, Dhaka, 2015.

[11] South Asia is among the least-integrated regions in the world. The World Bank estimates that only 5 percent of trade in South Asia is within the region, with most trade flowing externally. This stands in contrast to the 25 percent of intraregional trade that flows within ASEAN. "South Asia Regional Integration: One South Asia," World Bank, April 2015.

Bangladesh should assemble representatives from India and China on the sidelines of meetings of the Track 2 BCIM Forum for Regional Cooperation and the Joint Study Group of the Track 1 BCIM Economic Corridor to discuss Brahmaputra cooperation.[12] Because BCIM's focus is improving connectivity and regional economic relations, the subject of Brahmaputra water resources is a natural topic for BCIM to address formally or informally at meetings.

Dhaka should utilize the capabilities of its active think tank community to analyze specific aspects of basin-wide management of the Brahmaputra with upper-riparian counterparts. Bangladesh could expand dialogues on the Brahmaputra by relying on its think tanks to arrange meetings with counterparts in China and India. Think tanks in Dhaka include the Bangladesh Enterprise Institute—which is CNA's partner in Dhaka for this research—as well as the Bangladesh Institute of Peace and Security Studies and the Centre for Policy Dialogue. These organizations can organize confidence-building dialogues and technical meetings that focus on pollution, erosion, sedimentation, flood prevention, and flood-forecasting ability. Bangladesh should seek participation by subnational stakeholders in each of the three countries. The state of Assam in India, for example, is also concerned about sedimentation and riverbank erosion on the Brahmaputra.

In addition to technical analysis, Dhaka's think tanks can work with counterparts in India and China to study the lessons learned from other river basins that could be applied to the Brahmaputra. For example, water experts in Bangladesh view Switzerland's International Commission for the Protection of the Rhine as a positive model of the type of organization to which Brahmaputra stakeholders should aspire.

These kinds of regular interactions with focused discussions will lay the foundation for a new entity—a Brahmaputra Basin Commission—through which a water-management accord could be implemented in the coming decades.

[12] Myanmar is the other member of BCIM and shares three rivers with Bangladesh. Including Myanmar in these meetings could therefore be an option to help its neighbors resolve water resource tensions, even if its inclusion would be outside the scope of Brahmaputra basin cooperation.

RECOMMENDATIONS FOR THE INTERNATIONAL COMMUNITY

The international community should be alert to the long-term security implications of discord between Brahmaputra riparians and, alternatively, to the potential cooperation that could advance economic integration in the region. International financial institutions (IFIs), such as the World Bank and Asian Development Bank, and extraregional countries with capacity-building arms, such as the United Kingdom, the United States, and the Netherlands, have an important role to play. They can encourage China, India, and Bangladesh to work together in the Brahmaputra to promote economic development on water issues as well as political-military stability in how water-related disagreements are addressed in the basin. For example, the World Bank was critical to achieving the Indus Waters Treaty between India and Pakistan in 1960, because it recognized the importance of such an accord in promoting stability and interactions between governments that are often hostile to each other. Furthermore, such efforts by the international community can also promote the economic integration that South Asia so badly needs, as well as connectivity between subregions such as the BCIM Economic Corridor linking China and Myanmar to India and Bangladesh.

First, multilateral development banks—the World Bank, ADB, and Asian Infrastructure Investment Bank—should take advantage of opportunities to advance the physical and economic connectivity that is evident in the Brahmaputra basin, such as efforts to reinvigorate river navigation networks. Second, IFIs and extraregional countries should invest more in both technical dialogues between scientists and regional capacity-building on Brahmaputra hydrology to develop norms of information sharing, especially when focusing on the improvement of flood-forecasting capabilities.[13] Whereas think tanks in Bangladesh, India, and China can serve as effective conveners for policy makers through Track 1.5 or 2 confidence-building dialogues about

[13] For example, the joint World Bank-UK-Australia-Norway partnership, called the South Asia Water Initiative, and its predecessor, the Abu Dhabi Dialogue, have been useful in catalyzing discussion between Brahmaputra stakeholders, especially for the development of a hydrological database and modeling platforms to inform scientists in the region.

diplomatic challenges in the Brahmaputra basin, IFIs and extraregional countries can support progress on scientific capabilities in the Brahmaputra.[14] For example, the U.S. Army Corps of Engineers is an important provider of technical assistance on water security around the world and could give greater attention to the Brahmaputra basin. Multilateral development banks and extraregional countries can suggest creative solutions to the pressing problem of ensuring sufficient access to river flow in the dry season, possibly through storage of monsoon rainwater throughout the basin.

Finally, the most important recommendation for IFIs and extraregional countries is to conduct scientific studies on projections for future dry- and wet-season flows in the Brahmaputra and the impacts of stressors to the basin, such as climate change and sedimentation. Experts writing about the region have noted the difficulty in coming to clear, evidence-based conclusions about the full impacts of trends in the Brahmaputra given the dearth of scientific assessments. Forging progress from all Brahmaputra countries on basin management will require consensus on basic hydrological facts, a significant contrast to the current situation of claims by each riparian and little transparency on how countries come to their conclusions.

These recommendations will be quite costly to implement, but IFIs and extraregional countries with capacity-building arms are well positioned to conduct such efforts in the Brahmaputra. They can advance stability in a highly populated region that is often characterized by bilateral disputes and internal challenges.

[14] While not limited to the Brahmaputra, the International Union for Conservation of Nature launched a Track 3 dialogue called "Ecosystems for Life," which brought together Bangladeshi and Indian experts from civil society to workshops in Bangkok. Track 3 diplomacy emphasizes grassroots, people-to-people interactions. The Netherlands government funded the initiative. See Randal Glaholt, Julian Gosalves, and Donald Macintosh, *Ecosystems for Life: A Bangladesh-India Initiative* (Gland, Switzerland: International Union for Conservation of Nature, 2014).

GLOSSARY

ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
ASEAN	Association of Southeast Asian Nations
BBIN	Bangladesh-Bhutan-India-Nepal
BCIM	Bangladesh-China-India-Myanmar
BEI	Bangladesh Enterprise Institute
BJP	Bharatiya Janata Party
BRI	Belt and Road Initiative
CASS	Chinese Academy of Social Sciences
CICIR	China Institutes of Contemporary International Relations
CPR	Center for Policy Research (India)
cusec	cubic feet per second
FAO	Food and Agriculture Organization (UN)
GBM	Ganges-Brahmaputra-Meghna
GDP	gross domestic product
IFI	international financial institutions
IPCC	Intergovernmental Panel on Climate Change
IRBM	integrated river basin management
JRC	Joint Rivers Commission
JSG	Joint Study Group of the BCIM Economic Corridor
MEA	Ministry of External Affairs (India)
MOU	memorandum of understanding
MRC	Mekong River Commission

NGO	nongovernmental organization
NTRO	National Technical Research Organization (India)
PLA	People's Liberation Army
PRC	People's Republic of China
RLP	river-linking project
SAARC	South Asian Association for Regional Cooperation
SAWI	South Asia Water Initiative
SCO	Shanghai Cooperation Organisation
UN	United Nations

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RAGING WATERS

China, India, Bangladesh, and Brahmaputra River Politics

NILANTHI SAMARANAYAKE, SATU LIMAYE, AND JOEL WUTHNOW

Raging Waters: China, India, Bangladesh, and Brahmaputra River Politics provides greater understanding of the equities and drivers fueling water insecurity and resource competition in the Brahmaputra River basin. It also considers security implications at the subnational, bilateral, and basin-wide levels of analysis. Drawing on original research conducted in the three countries—China, India, and Bangladesh—the authors offer recommendations for policy makers to take steps to manage rising water resource competition. By focusing on shared interests and solutions that address underlying long-term water needs and economic development of the basin, Brahmaputra stakeholders can draw on the book's findings to strengthen regional security.

Originating in China and traveling through India and Bangladesh, the Brahmaputra is an underexamined river basin whose management raises serious concerns for regional stability. China and India are actively constructing dams and considering water diversion plans, while Bangladesh faces human security pressures that will be magnified by upstream river practices. Unlike the Indus or Ganges Rivers, there is no bilateral or multilateral accord for management of the Brahmaputra River. Moreover, the basin is home to three of the most populous nations in the world—two of which (China and India) fought a war in 1962 over still-contested territory through which the Brahmaputra flows.

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