

# Analyzing China's Concept of Water and Its Implications for India and Bangladesh

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## Structured Abstract

Article Type: Commentary Essay

*Purpose*—The availability and use of clean water has been a point of contention for many countries since time immemorial, particularly for countries with a vast population such as China and India. The use of existing resources is a fight for survival, and it is necessary to understand how the perspective of one country has implications for others to such a vast extent that countries have to be aware of their neighboring country's resources in order to formulate their own policies.

*Design, Methodology, Approach*—This article pursues its analysis primarily by conducting a literature review to determine what the concept of “water” means to China and conducting research to understand the current situation in China. Based on the same, implications are drawn for India and Bangladesh and policy recommendations made so that these countries can sustain themselves.

*Findings*—The findings are a true projection of the water crisis prevalent in the Global South countries. It has been found that there is a severe water crisis in China and many regions do not have sufficient access to clean water. The lack of availability of fresh water sources, the existence of pollution and climate change are detrimental to the ecosystem in China. Due to the same, the Chinese are drawing on resources and the same causes stress on other countries, such as India and Bangladesh, as they share a common water resource and physical boundaries.

*Practical Implications*—India and Bangladesh need to formulate policies and maintain better foreign relations to ensure they will have access to fresh water sources and are able to protect themselves.

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*Originality, Value*—Water issues are only bound to get worse with the current situation and measures must be taken at all times to ensure the survival of the ecosystem.

Keywords: China-India-Bangladesh relations, water issues,  
water scarcity, water stress

## I. Introduction

In many parts of China, there is a severe problem with water scarcity. The per-person water resources are barely 2,100 cubic meters, or one-fourth of the global average.<sup>1</sup> The issue is made more difficult by factors including population expansion, agricultural demand, and the negative effects of climate change.<sup>2</sup> It is also important to understand that in China, 80% of the human population lives in 10% of the land area.<sup>3</sup> These factors also have impacts on neighboring countries, such as India and Bangladesh, and these nations need to be prepared with their own policies if they wish to sustain themselves.<sup>4</sup> This paper analyzes the current Chinese perspective on water and its implications on India and Bangladesh and seeks to suggest some measures so that these countries can sustain themselves.

## II. The Chinese Perspective on “Water”

Water has been the backbone of agriculture for thousands of years, and waterways have served as a means of transportation. China is home to a huge landmass, an abundance of resources, but also the regions are highly different from one another. It is also the birthplace of oriental civilization.<sup>5</sup>

China’s water philosophy is based on the notion of “Water Civilization.” It is an all-encompassing strategy that emphasizes the significance of water in all aspects of life, including agriculture, industry, and urban growth. The conservation, allocation, and protection principles underpin China’s water management plan. China’s water conservation policy entails lowering water use through improved management practices and technologies. Improving irrigation efficiency, promoting water-saving crops, and implementing water recycling and reuse programs are all part of this. The goal of China’s water allocation plan is to balance water resources among regions and sectors. Setting water quotas for different regions, creating water markets, and enacting water price rules are all part of the process. This aids in the prevention of water disputes across regions and industries.

Five lake zones predominate in China. With nearly 50% of the world’s lakes located there, the Tibetan Plateau has the most lakes overall. The majority of such lakes are clean and unpolluted. Rather than pollution, aridification is the main threat to lakes in north-west China, where lakes are quickly disappearing.<sup>6</sup> With a fourth of the total lake area, the middle and lower Yangtze River region has the second-highest density of lakes. Over 80% of such lakes there have severe pollution problems. Lake Tai and Lake Chao in this area are the worst affected. Due to the eutrophication of Lake Tai, a significant water crisis occurred in Wuxi in 2007. Northeast China is home to the fourth lake region. Finally, the degree of human impact on lakes varies between the provinces of Yunnan and Guizhou.<sup>7</sup>

A number of water management cases played a significant role in China’s successful

water governance throughout its history.<sup>8</sup> In the 1950s, there were around 9,000 yearly deaths from floods; in the previous ten years, there have been about 540. For the majority of the population, the quality of drinking water has improved.<sup>9</sup> Prior to the Water Law of 2008, China used a system to manage water that was chaotic, with many, hazy administrative institutes that carried out diverse tasks for managing water resources. The mechanism for managing water resources was comparatively disjointed.<sup>10</sup> The level of implementation was relatively low in intensity and efficacy, and was full of legal loopholes due to a lack of clarity in the law. As per the new law, the State Council's water administration department is in charge of the uniform management and oversight of the nation's water resources. Although the new "Water Law" has significantly improved the way that water resource management systems are managed, many systems in particular still lack soundness as a result of the influence of numerous causes. Furthermore, these flawed systems are having a very difficult time being implemented in the current legal climate.

### III. Current Water Situation in China

North China frequently experiences year-round water scarcity due to both inadequate water quantity and quality, but South China experiences periodic water scarcity mostly because of declining water quality. In the last ten years, the authorities in China have spent a massive amount of money in determining the state of water in the region and in attempting to fix the condition of water, as well as to find ways of accessing more clean water.<sup>11</sup>

Pollution is rampant in China and many resources are severely polluted; additionally, there is massive water scarcity prevalent in many regions. Through a series of interconnected operations in the Chinese provinces of Hebei, Shanxi, and Ningxia—three of the most water-scarce provinces in the Northern area of the country—the World Bank-supported Water Conservation Project II addressed these water shortage challenges head-on. The results<sup>12</sup> in the project areas included:

- In every case, crop yields rose significantly from the 2011 baseline estimates.
- Hebei's groundwater overdraft was reduced by 16.52 MCM (million cubic meters) annually.
- Shanxi lowered its annual groundwater withdrawal by 5.80 MCM.
- In the regions where the scheme was carried out, agricultural water productivity rose from 1.0 to 1.40 kg/m<sup>3</sup> (of ET [evapotranspiration]).

This project assisted with greener growth and focused on sustainability, which is good as the idea is to maximize the limited resource. The project helped put China's national strategies and policies for managing water resources and developing its agriculture into practice. It is also encouraging to observe how the project's novel methods of water management are now being used more widely in China and influencing other initiatives that the World Bank supports in other regions of the world.<sup>13</sup>

China's concept of water has been shaped by its unique geography and water scarcity challenges. China is home to just 7% of the world's freshwater resources but has a population of over 1.4 billion people. This has led to intense competition for water resources, particularly in arid and semi-arid regions. China has responded to these challenges by

developing a comprehensive approach to water management that focuses on conservation, allocation, and protection.

China's water management practices have significant implications not only for China but also for its neighboring countries. China shares several transboundary rivers with neighboring countries, including the Brahmaputra, the Indus, and the Ganges. China's dam-building activities on the Brahmaputra River have raised concerns in neighboring countries over the impact on downstream water availability. China's water allocation policy could also have implications for downstream countries as increased water demand in China could lead to a reduction in water flow to downstream regions.

Similarly, many more projects are being undertaken to preserve water and source more resources. This is evident in the way China has been building dams around resources and has been sourcing out excess water from Brahmaputra. Ten main rivers that flow into 11 different nations originate in China, which is the world's leader in the construction of hydropower dams. Because of this, neighbors to the south are concerned that it controls all of Asia's major water sources. China is in a unique position of ultimate control over the majority of the Tibetan plateau because it holds the headwaters of the major international rivers, which provide water to over 40% of the world's population.

#### **IV. Implications for India and Bangladesh**

Because several transboundary rivers run through India and China, including the Brahmaputra, Indus, and Ganges, water management practices in China have serious consequences for India's water security. China's dam-building efforts on the Brahmaputra River have alarmed Indians, who are concerned about the impact on downstream water supplies. China's water distribution program, which involves allocating water allotment to different areas, may have ramifications for India as well. As China's water demand rises, the supply of water to India may decrease. This might have a huge impact on irrigation-dependent agriculture in India.

Bangladesh is a low-lying delta area that is particularly vulnerable to climate change and natural calamities. China's water management practices may have serious consequences for Bangladesh's water security. China's dam-building efforts on the Brahmaputra River might disrupt the downstream flow of water to Bangladesh, wreaking havoc on agriculture and fisheries.

China's water preservation program, which strives to enhance water quality, might benefit Bangladesh. The country's drinking water is mainly reliant on groundwater, which is frequently polluted by arsenic. China's experience in water treatment technologies might assist Bangladesh in improving the quality of its water.

There have been numerous water resource disputes between India and China in recent years.<sup>14</sup> Conflicts are mostly brought on by the creation and exploitation of transnational rivers, as was previously stated. Although China and India share boundaries and more than 15 rivers in common, the Brahmaputra (also known as Yarlung-Zangbo in China) is the focus of the most pertinent conflict between the two countries since it is seen as a key resource for long-term sustainable development. The matter is more complicated than it first appears because it involves not just the river's water but also some areas in Arunachal

Pradesh, where conflicts regarding the territory of such region is prevalent. This region is also part of the Brahmaputra basin. It is reasonable for India to be concerned about proposals to divert the Brahmaputra. There are currently 28 proposed dams in the basin, but the hydropower plan from Yarlung-Zangbo purportedly includes the development of several hydroelectric facilities in addition to the 12 tiny dams on the upper reaches and tributaries of the Brahmaputra that already exist, with one under construction. Despite being very advantageous for Chinese interests, the consequences for Bangladesh and India will be catastrophic. Approximately 60% of the overall water flow will severely decrease, according to environmental experts, if this does happen, and this is a cause for concern for neighboring nations as their access to water gets cut off massively and China would be the one controlling the dams.

The Brahmaputra's water resources can also be used by China as leverage over India. By obstructing the flow of water upstream, China could easily cause famine throughout India's whole northeast. Additionally, the construction of Chinese escalation dams would restrict India's ability to move on with its own plans to set up hydroelectric projects on its soil to meet its energy needs.<sup>15</sup>

The main point of contention between India and Bangladesh relates to the management of the river called the Teesta. This is also a branch of the Brahmaputra river.<sup>16</sup> Of Bangladesh's total cropland, 14 percent is in the Teesta flood plain, and more than 7% of the population relies on the river for their livelihood. Farmers and other Bangladeshi citizens who depend on the Teesta River for their day-to-day survival have difficulty due to the decrease in water availability from the river. India's river management, which routinely diverts water from the river particularly for irrigation during the dry season, also adds to the consumers of this water, and there is further conflict as both China and India rely on such water. Bangladesh is also a contender during the dry season as well, as they rely on the river for their water source and due to India drawing from the same, it becomes difficult for them to access the water.

In compliance with international conventions, such as the Watercourses Convention, the central government of India has made an effort to find a fair and reasonable solution to the Teesta management dispute with Bangladesh. In truth, a solution—in the form of a Memorandum of Understanding to distribute the water evenly between the previous prime ministers of India, Manmohan Singh, and Bangladesh, Sheikh Hasina—was about to be reached in 2011, though did not yield results.<sup>17</sup> The Teesta conflict may need a comparable amount of diplomatic compromise.<sup>18</sup>

The concerns for India and Bangladesh are many, such as Chinese pollution potentially making transboundary rivers unusable, sabotaging them. Concerns over China's upstream activities were raised in 2017 when some rivers were found blackened, with multiple sediments found on the riverbed and the water unsafe for human consumption.<sup>19</sup> Not only does this affect the regions in China and the villages therein, but it also affects the neighboring nations. This incident had a negative effect on fishing communities as well as agriculture productivity in the Siang valley, which is crucial to India due to the production of rice therein.

While during this incident, China had claimed that the cause of such sediments was not due to their actions and was only due to an earthquake, some reports that earlier stated that evidence was found that this happened say otherwise. China, also due to their

geographical location, have in their possession data related to rivers and lakes; knowledge of these can be used to control flooding and upstream fluctuations. In order to facilitate cooperation and collective use of resources in the regions, China and India have signed two agreements concerning data exchange for the Sutlej and Brahmaputra post-2007. While in theory these agreements are said to help relations, the reality is far different. While there have been improvements with respect to the management of water, there are also ways for countries to withhold information from another that is dangerous and detrimental to the other.<sup>20</sup>

According to allegations, China violated the deal by withholding important information pertaining to the Brahmaputra and Sutlej rivers, which led to floods in the states of Assam and Uttar Pradesh. Shared waters in the neighborhood had previously caused concern. Concerningly, there were some concerns with the Parechu River in 2004 and there was a possibility that some portions of India experience floods because of the same. During the same, China, as per its obligation, did share useful information regarding the flow of the river. However, there was a rumor that China purposefully created a “liquid bomb,” an artificial lake that could be released whenever China chooses to and that would be detrimental to regions in India. China also denied India’s demand to send experts to the region and this further added to the rumor mill. When a surge of 12 to 14 meters was noticed in the river in June 2020, the possibility of China using the river as a tool to harm India became more realistic.<sup>21</sup> While there has not been any such conclusion thereof, it is still important for nations around China to prepare themselves for such actions and to be on alert. These are all concerns for India and Bangladesh.

Reservoirs and dams are necessary for the effective management of surface water resources in China due to the country’s harsh monsoon environment, which causes alternating periods of drought and flooding. The Three Gorges Dam, the largest dam in the world, is one of the numerous enormous dams in China, which also has the most dams overall. Large water transport infrastructure has also been constructed in China to alleviate the uneven distribution of resources among the region’s several basins. This is a cause for concern for other nations as these large dams can store tons of water, thereby cutting off access to water for other regions and leading to a lack of availability of resources. The ecological impact of these dams must also be considered, as India and Bangladesh, being the neighboring countries, will face the brunt of damage caused to the nearby villages, the land and the consequences of any damage to the dams. The floods caused due to excessive storage of water in the dams and the consequences of climate change are both not singular events that will impact a particular region. These are all ongoing impacts that have the power to affect multiple regions, and both Bangladesh and India must be wary of them.

## V. Conclusion

Water scarcity is predicted to worsen due to climate change. The Himalayan glaciers and snowpack, which feed many of China’s rivers, will melt as a result of the world’s temperatures rising. This will increase the seasonal variability of water in the rivers in the region, and over time it will result in less water being available. In addition to reducing China’s water supply, the changes brought about by climate change in the form of extreme



weather events are all causes of concern that would further impact the availability of water. Urbanization could continue to put pressure on water supply in big cities. Around 80% of the people in China are anticipated to migrate to cities by 2050.<sup>22</sup> Because of China's harsh monsoon climate, which produces alternating periods of drought and flooding, reservoirs and dams are essential for the efficient management of surface water supplies. The world's largest dam, The Three Gorges Dam, is one of the many huge dams in China, which also has the most of them overall. Large water transport facilities have also been built in China to address the differential distribution of resources across different basins in the region.

The failure of state regulatory agencies to adequately oversee, monitor, and enforce Chinese water-quality legislation would need a shift in strategy. Environmental and human disasters will intensify unless China quickly develops the legal, technological, and institutional instruments to clean up water pollution, minimize wasteful and inefficient water consumption, restore natural ecosystems, and generate sustainable sources of supply.

Furthermore, developing supply limitations are limiting the amount and type of economic activity that the Chinese may pursue, raising the prospect of decreases in agricultural productivity or industrial output in the future years. New methods, tactics, and technologies will have to be tested as China strives for long-term sustainable use of its rare and important freshwater resources.

These are all important to India and Bangladesh as these regions will face the impact of these measures and situation. What is important for India and Bangladesh to do, is to strengthen cooperation among themselves so that they can present a united front against China in the fight for water. Both these countries need to make sure that diplomacy and foreign relations are at their very best with other South Asian nations so that they all can benefit from each other, and at the same time international pressure will coerce China into acting in a fair manner. It is also time for these nations to set up better systems in place to access sea water and cleanse the same, so that it can be used for their needs. The same needs to be done with rainwater as that can be preserved. There also needs to be a system to handle heavy rains that are prevalent in both the countries; instead of it leading to floods, preservation measures must be found. The Brahmaputra is a common resource and diplomacy can be the key to ensure that its resources are shared equally across all regions. Setting up a committee to monitor the same can be useful, provided India and Bangladesh are able to tackle Chinese insistence and actions with the support of foreign pressure.

## Notes

1. Sing Cho, "China's Experience in Tackling Water Scarcity Through Sustainable Agricultural Water Management," *World Bank Blogs*, June 13, 2018, <https://blogs.worldbank.org/water/china-experience-tackling-water-scarcity>, accessed August 31, 2022.

2. *Ibid.*

3. T. Ma, S. Sun, G. Fu et al., "Pollution Exacerbates China's Water Scarcity and Its Regional Inequality," *Nat Commun* 11 (650) (2020), <https://www.nature.com/articles/s41467-020-14532-5>, accessed August 31, 2022.

4. *Ibid.*

5. Shaofeng Jia and Dalong Li, "Evolution of Water Governance in China," *Journal of Water Resources Planning and Management* 147(8) (August 2021), <https://ascelibrary.org/doi/10.1061/%28ASCE%29WR.1943-5452.0001420>, accessed August 31, 2022.

6. Jane Qiu, "Safeguarding China's Water Resources," *National Science Review*, 5(1) (January 2018),

pp. 102–107, <https://academic.oup.com/nsr/article/5/1/102/4810551>, <https://doi.org/10.1093/nsr/nwy007>, accessed August 31, 2022.

7. *Ibid.*

8. *Ibid.*

9. *Ibid.*

10. J. Li, X. Lei, Y. Qiao, A. Kang, P. Yan, “The Water Status in China and an Adaptive Governance Frame for Water Management,” *Int J Environ Res Public Health* (2020), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7143287/>, accessed August 31, 2022.

11. *Ibid.*

12. *Ibid.*

13. *Ibid.*

14. Federico Togni, “Water Grabbing in Himalayan Asia, the Conflict Over the Brahmaputra River Between China, India and Bangladesh,” ResearchGate, March 2014, [https://www.researchgate.net/publication/268118304\\_Water\\_grabbing\\_in\\_Himalayan\\_Asia\\_the\\_conflict\\_over\\_the\\_Brahmaputra\\_river\\_between\\_China\\_India\\_and\\_Bangladesh#pdf](https://www.researchgate.net/publication/268118304_Water_grabbing_in_Himalayan_Asia_the_conflict_over_the_Brahmaputra_river_between_China_India_and_Bangladesh#pdf), accessed August 31, 2022.

15. Ashfaquul Chowdhury, “China, India, and Bangladesh’s Contentious Water Politics,” *South Asian Voices*, January 23, 2020, <https://southasianvoices.org/china-india-and-bangladeshs-contentious-water-politics/>, accessed August 31, 2022.

16. *Ibid.*

17. *Ibid.*

18. *Ibid.*

19. *Ibid.*

20. *Ibid.*

21. *Ibid.*

22. China Power Team, “How Does Water Security Affect China’s Development?,” *China Power*, February 25, 2020, <https://chinapower.csis.org/china-water-security/>, accessed August 31, 2022.

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