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Jin H. Pak

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China, India, and War over Water

Jin H. Pak

ABSTRACT: This article examines the likelihood of water insecurity causing war between China and India. Water insecurity itself will not likely lead to armed conflict. But when coupled with other international and domestic factors, it could increase the likelihood of war. China's water scarcity and its widening north-south water gap have increased pressure to execute controversial water diversion plans. These plans will threaten India, especially since the Brahmaputra River flows through a disputed area. These factors, plus changing domestic conditions in China, may increase the likelihood of war.

Over the past decade, numerous analysts and scholars have speculated about the likelihood of India and China going to war over water. Some maintain a future “water war” will occur—and others call such fears overblown.¹ These arguments focus on how water is unevenly distributed and how China's upstream behaviors, such as its damming activities, could instigate conflict with its downstream neighbor.

To determine if water scarcity could cause military conflict between these two states, an extensive analysis of factors affecting relations between India and China, as well as domestic conditions within China, are needed. Such analyses suggest water scarcity itself will not likely lead to war. However, coupled with other factors such as increasing water scarcity in China, linkages between water scarcity and national sovereignty, and decreasing political stability in the upstream state, war may become more likely.

The glaciers in China's Tibet are melting at a faster rate, and coupled with growing water scarcity and a widening north-south regional water gap, China will face increasing pressure to implement a controversial upstream water diversion plan in its western provinces. This plan will threaten India since the downstream portion of the Brahmaputra River flows through a disputed area with strong implications for national sovereignty. Both states will then increase their security postures in an already heavily militarized border region. As China's economic growth continues its downward trajectory, popular nationalism will threaten the Chinese Communist Party's ability to pursue a foreign policy

COL Jin H. Pak was commissioned in 1994, and since then he has served in multiple leadership roles, to include battalion commander and military assistant to the Army G-4. He has also taught international relations at West Point. Pak earned a BS in Economics from West Point and a MPP from the Kennedy School of Government at Harvard University.

1 For a concise synopsis of the two opposing arguments, see Sudha Ramachandran, “Water Wars: China, India and the Great Dam Rush,” *The Diplomat*, April 3, 2015, <http://thediplomat.com/2015/04/water-wars-china-india-and-the-great-dam-rush/>.

uninfluenced by populism and public opinion. The likely net result: a likely water war between the two states.

Water Scarcity and its Ties to Conflict

The idea of water security has gained traction over the years, and is defined as “the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems, and production, coupled with an acceptable amount of water-related risks to people, environment, and economies.” This idea includes the negative effects of having too little water, or “water scarcity,” and damage from having too much water such as floods, contamination, erosion, and epidemics.² This article focuses on the scarcity component of water insecurity and assesses six driving factors that make it more likely China and India will fight over water in the future. But, first, let us discuss how water scarcity is related to conflict.

People can survive plague, war, and natural catastrophes, but they cannot survive without water. Unfortunately, fresh water is an increasingly scarce and precious resource. Less than 2.5 percent of all water on earth is fresh water, and more than half of it is trapped in polar ice and high-altitude glaciers around the world. This precious-little amount is declining due to increasing consumption, pollution, and climate change. “Global per capita freshwater availability has unstoppably declined for more than a century, plummeting more than 60 percent since 1950 alone.”³

At the turn of the millennium in 2000, more than one billion people could not access clean drinking water.⁴ According to a recent article co-authored by the chair of the Department of Water Engineering at the University of Twente in the Netherlands and a water scarcity expert from the Johns Hopkins Water Institute, approximately 66 percent of the world’s population, or more than four billion people, live in areas under severe water scarcity. Of these four billion people, one billion live in India, and 900 million live in China; the majority of their populations thus live in areas of severe water scarcity.⁵ In 2006, a World Bank Working Paper on water scarcity claimed “China will soon become the most water-stressed country in East and Southeast Asia.”⁶

Water scarcity is also linked to food availability. Agriculture accounts for 70 percent of all global water consumption, compared to 19 percent for industry and about 11 percent for drinking.⁷ The Strategic Foresight

2 David Grey and Claudia W. Sadoff, “Sink or Swim? Water Security for Growth and Development,” *Water Policy* 9, No. 6 (Washington, DC: The International Bank for Reconstruction and Development/The World Bank, 2007): 545-546.

3 Brahma Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis* (Lanham, MD: Rowman & Littlefield, 2013), 60, 62.

4 Thomas F. Homer-Dixon, “Scarcity and Conflict,” *Forum for Applied Research and Public Policy* 15, no. 1 (Spring 2000): 28.

5 Mesfin M. Mekonnen and Arjen Y. Hoekstra, “Four Billion People Facing Severe Water Scarcity,” *Science Advances* 2, no. 2 (February 12, 2016): 3. The two authors assessed water scarcity on a monthly basis using a ratio between water consumption and water availability. A water scarcity (WS) ratio of greater than 2.0 meant consumption far exceeded water availability and severe water scarcity. By their calculations, more than four billion people live in areas with a WS score greater than 2.0.

6 Zmarak Shalizi, “Addressing China’s Growing Water Shortages and Associated Social and Environmental Consequences,” *World Bank Policy Research Working Paper - Vol. 3895* (Washington, DC: The World Bank, April 2006): 5.

7 Chellaney, *Water, Peace, and War*, 64.

Group, a prominent India-based think tank that publishes extensively on climate change and environmental issues, projects both India and China will face a 30 to 50 percent decline in rice and wheat yields by 2050 due to “the cumulative effect[s] of water scarcity, glacial melting, disruptive precipitation patterns, flooding, desertification, pollution, and soil erosion.”⁸

Brahma Chellaney, Professor for Strategic Studies at the New Delhi-based Center for Policy Research and a noted scholar on water security, asserts water is now the world’s most extracted resource.⁹ In fact, water is already more expensive than oil. According to the US Energy Information Agency, the average retail price for gasoline for all grades in the United States on February 1, 2016 was \$1.93 per gallon, or \$0.51 per liter, well below the retail price US consumers pay for a liter of water.¹⁰

In the scholarly literature regarding water security, one common refrain is, “no nations have ever gone to war strictly over access to water, nor are any likely to do so in the future.”¹¹ Juha Uitto, at the United Nations Human Development Program, and Aaron Wolf, professor of geography at Oregon State University, find only one war was fought over water, and only seven cases exist of acute water-related violence between states.¹² Moreover, there have been more than 3,600 water-related treaties over the years, reflecting a strong record of cooperation.¹³

Yet, there is a growing body of work suggesting water security will cause war. Peter Gleick theorizes environmental security issues will become a more dominant part of international discourse in the post-Cold War era. He claims rapid population growth, increased migration, greater demands on environmental resources, and future climactic changes will increase international tensions over shared fresh-water resources.

In 1978, when Ethiopia publicized its intention to construct dams in the upstream section of the Nile River, Egypt’s President Anwar Sadat said, “We depend upon the Nile 100 percent in our life, so if anyone, at any moment, thinks to deprive us of our life, we shall never hesitate [to go to war] because it is a matter of life or death.”¹⁴ Furthermore,

8 Strategic Foresight Group, *The Himalayan Challenge: Water Security in Emerging Asia* (Mumbai: Strategic Foresight Group, 2010): iv.

9 Chellaney, *Water, Peace, and War*, 5.

10 “Weekly Retail US Gasoline and Diesel Prices,” *US Energy Information Agency Independent Statistics and Analysis*, February 1, 2016, https://www.eia.gov/dnav/pet/PET_PRI_GND_DCUS_NUS_W.htm (accessed February 7, 2016).

11 Jack A. Goldstone, “Population and Security: How Demographic Change Can Lead to Violent Conflict,” *Journal of International Affairs* 56, no. 1 (Fall 2002): 8.

12 Juha I. Uitto and Aaron T. Wolf, “Water Wars? Geographical Perspectives: Introduction,” *The Geographical Journal* 168, no. 4 (December 2002): 289. The seven cases are: between India and Pakistan in 1948 over access to the Indus basin; between Syria and Israel in 1951 over Israeli water projects in the Huleh Basin; between Egypt and Sudan in 1958 over the Nile River; between Somalia and Ethiopia in 1963-1964 over water in the Ogaden Desert; between Israel and Syria in 1965-1966 over Arab plans to divert the Jordan River; between Iraq and Syria in 1975 over the Euphrates River; and between Mauritania and Senegal in 1989-1991 over grazing rights along the Senegal River; and Aaron T. Wolf, “Conflict and Cooperation along International Waterways,” *Water Policy* 1, no. 2 (January 1998): 256.

13 Uitto and Wolf, “Water Wars? 289; and Todd Hofstedt, “China’s Water Scarcity and Its Implications for Domestic and International Stability,” *Asian Affairs: An American Review* 37, no. 2 (April-June 2010): 77.

14 Peter H. Gleick, “Environment and Security: The Clear Connections,” *Bulletin of the Atomic Scientists* 47, no. 3 (April 1991): 17, 20.

water has contributed to fighting in the Middle East between Israel and its Arab neighbors for decades. Located in one of the driest areas on Earth, Israel relies on the Jordan River for much of its water, a resource it shares with the four other riparian states: Lebanon, Syria, Jordan, and the Palestinian Authority.¹⁵

In the late 1950s, Israel began a project to divert water away from the Jordan River for distribution elsewhere in Israel. Arab states responded with their own project to divert water into Lebanon, Syria, and Jordan. In 1964, the year the Arab project was supposed to commence, the first of a series of border clashes between Israel and Syria occurred that targeted water facilities. These clashes contributed to the state of heightened tensions between Israel and the Arab states during which time Egypt mobilized its military along the Sinai Peninsula. Israel responded with a preemptive attack, and the 1967 Six-Day War.¹⁶

Rebecca Lowe and Emily Silvester's report on water shortages threatening global security argues water can spark conflict when other destabilizing factors already exist: "combine water scarcity with political instability, increasing resource demands and climate change, and the 'perfect storm' for conflict can be created."¹⁷ While water can help cause war, it is surely not the sole reason for a war: "when territorial disputes overlap with water wrangles—as has been the case in a number of prominent post-World War II feuds—water is usually an underlying driver, rather than an overt instigator of conflicts."¹⁸ Miriam Lowi, noted scholar on water scarcity in the Middle East, argues the geographical positions of states along a transboundary river system also affect the level of cooperation over water distribution—with clear advantages going to the upstream state which could use the water unilaterally without regard to the needs of the downstream state.¹⁹

Despite considerable evidence of cooperation over water usage, a number of arguments link water scarcity and armed conflict. While states have not fought exclusively over access to water, increased water scarcity, when combined with other factors such as upstream-downstream positioning, sovereignty linkages, and political instability, may lead to war. These factors provide the foundation for examining the driving factors linking water security to the possibility of war between China and India:

15 Meredith Giordano, Mark Giordano, and Aaron Wolf, "The Geography of Water Conflict and Cooperation: Internal Pressures and International Manifestations," *The Geographical Journal* 168, no. 4 (December 2002): 295.

16 Miriam R. Lowi, "Water and Conflict in the Middle East and South Asia: Are Environmental Issues and Security Issues Linked?" *The Journal of Environment and Development* 8, no. 4 (December 1999): 387.

17 Rebecca Lowe and Emily Silvester, "Water Shortages Threaten Global Security," *International Bar Association Global Insight* 68, no. 4 (August 2014): 48.

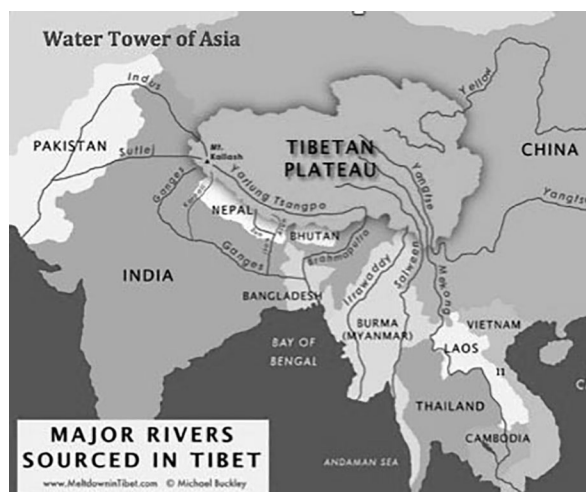
18 Chellaney, *Water, Peace, and War*, 54.

19 Miriam R. Lowi, *Water and Power: The Politics of a Scarce Resource in the Jordan River Basin* (New York, NY: Cambridge University Press, 1993), 10.

1. China's growing water scarcity.
2. China's future upstream activity.
3. Sino-Indian dispute over Arunachal Pradesh.
4. Increasing political instability in China.

Driving Factor #1: China's Growing Water Scarcity

China's Tibetan plateau, nestled in the Himalayas, is the source of Asia's 10 major river systems, including the Yellow, Yangtze, Indus, Sutlej, Brahmaputra, Salween, and Mekong. It is no wonder many refer to Tibet as the "Water Tower of Asia." These rivers traverse 11 countries and support 2 billion people stretching from Afghanistan to India in South Asia, and to Vietnam in Southeast Asia. Due to its upstream position, China enjoys a potential monopoly over the supply of fresh water for most of South and Southeast Asia. In the case of India, both the Indus and Brahmaputra Rivers flow downstream from China into its borders. In fact, China is the source of more transnational water flows than any other upstream power in the world.²⁰



Major Rivers Sourced in Tibet²¹

Consequently, despite the wealth of water in Tibet, China faces an emerging water crisis further aggravated by overuse and pollution. In 2004, China's available water per capita was one of the lowest in the world for a populous country, just one-third of the average for developing countries, one-fourth of the world average, and one-fifth of the US average. This comparison reflects a 23 percent decline in China's available water per capita over the past 20 years. Meanwhile, the demand for

20 Of all the major rivers originating in the Himalayas, only the Ganges River originates outside of Tibet. See Hofstedt, "China's Water Scarcity and its Implications for Domestic and International Stability," 78; Chellaney, *Water, Peace, and War*, 231; Uttam Kumar Sinha, "Examining China's Hydro-Behavior: Peaceful or Assertive?" *Strategic Analysis* 36, no. 1 (January 2012): 42; Lowe and Silvester, "Water Shortages Threaten Global Security," 45; and Chellaney, *Water, Peace, and War*, 231.

21 Major Rivers Sourced in Tibet [Map]. Climate Change and Its Impact on our World's Major Rivers – Part 1: The Rivers of Asia, *21st Century Tech*, September 4, 2013, <http://www.21stcentech.com/climate-change-impact-major-rivers-asia/> (accessed December 1, 2015).

water is growing more than 10 percent annually in Chinese cities—and more than five percent annually for its industries.²²

This precipitous decline in available water has worsened an already critical shortage in drinking water for China's huge population. More than 25 percent of all Chinese are without access to drinking water. Almost half of China's 668 largest cities are short of water with 108 identified as "serious" and 60 as "critical." By 2030, the Chinese government predicts the country's annual freshwater shortage will reach 200 billion cubic meters.²³

China's worsening water shortage is exacerbated by increased pollution on a historic scale. More than 90 percent of China's underground aquifers, which supply 70 percent of the country's drinking water, are polluted. More than half of China's population drinks water contaminated with organic waste. More than 75 percent of surface water flowing along China's rivers is unsafe for drinking or fishing, and 30 percent is unsuitable for agriculture and industry.²⁴

China's water problem has a stark regional dimension as well; the south has the preponderance of water while the north has the higher demand. This has created a significant regional disparity that is getting worse with time. While 45 percent of China's population and 60 percent of its agriculture are in the north, the region has only 13.8 percent of the fresh water. In per capita terms, the amount of available water in the north is about 25 percent of that available in the south.²⁵

Driving Factor #2: China's Future Upstream Activity

To remedy the great north-south water divide, China started a massive South-North Water Diversion Project to transfer a total of 38 to 48 billion cubic meters of water annually. Officially announced by China's State Council in 2002, the project called for diverting waters along three different routes—an eastern route, a central route, and a western route. The water diversion projects along the first two routes are already completed and are transferring water from China's Yangtze and Han Rivers in the south to the Yellow River in the north. The third route is still under development. It will divert tributaries to the upstream portion of the Yangtze River in western China to the Yellow River. However, in the last 30 years, Chinese scholars and officials have proposed going above and beyond this project by diverting water from

22 Elizabeth C. Economy, "The Great Leap Backward? The Costs of China's Environmental Crisis," *Foreign Affairs* Vol. 86, no. 5 (September 2007); Shalizi, "Addressing China's Growing Water Shortages and Associated Social and Environmental Consequences," 4-5; and Kathleen Cannon, "Water as a Source of Conflict and Instability in China," *Strategic Analysis* 30, no. 2 (April-June 2006): 310.

23 Ibid., 312; Hofstede, "China's Water Scarcity and its Implications for Domestic and International Stability," 72-73.

24 Cannon, "Water as a Source of Conflict and Instability in China," 313; and Economy, "The Great Leap Backward?"

25 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): 30; and Shalizi, "Addressing China's Growing Water Shortages and Associated Social and Environmental Consequences," 7.

the upstream portions of the Mekong, Salween, and Yarlung Tsangpo Rivers that flow from China's Tibet.²⁶

India views this additional diversion plan with great trepidation because it would affect the downstream flow of water into the Brahmaputra River; the Yarlung Tsangpo River becomes the Brahmaputra River once it flows across the Indian border.²⁷ The Brahmaputra River holds special importance for India. First, it accounts for almost 29 percent of all surface water in India's rivers. Second, it encompasses roughly 44 percent of India's total hydropower potential. Of course, China's upstream activities will reduce both the run off and hydropower potential India could expect from the Brahmaputra River. Considering India's population is expected to grow by another 500 million by 2050, it is no surprise water diversion is a serious issue.²⁸

Thus far, the Chinese government has not officially approved plans to divert the Yarlung Tsangpo River. However, India remains concerned about China's future intentions. In 1999, China's State Council established a special task force of experts from the Ministry of Water Resources, the Ministry of Land and Resources, the Science Academy, and other agencies, to conduct a major field study of the Grand Western Water Diversion Plan (GWWDP). After a 36-day field research trip, the task force published a report in support of the water diversion plans outlined in the GWWDP.²⁹ After listening to the report in October 2012, General Zhao Nanqi, deputy chairman of the ninth Chinese People's Political Consultative Conference and a former president of the Military Academy of Sciences, stated, "Even if we do not begin this water diversion project, the next generation will. Sooner or later it will be done."³⁰ In 2005, Li Lang, an officer from China's second artillery corps, published a widely read book which listed various reasons and options for diverting the Yarlung Tsangpo River.³¹

Many Chinese experts have refuted the technical feasibility of the Grand Western Water Diversion Plan. In 2000, the minister of water resources told China's state council the project was technically and economically impossible, and his successor echoed these concerns. In 2006, China's Engineering Academy, in consultation with numerous academics and experts, produced a report refuting the findings from the 1999

26 Hofstedt, "China's Water Scarcity and its Implications for Domestic and International Stability," 74; Kiki Zhao, "Water From China's South-North Transfer Project Flows to Beijing," *The New York Times*, December 25, 2014, <http://sinosphere.blogs.nytimes.com/2014/12/25/water-from-chinas-south-north-transfer-project-flows-to-beijing/>; and Hongzhou Zhang, "Sino-Indian Water Disputes: The Coming Water Wars?" *Wiley Interdisciplinary Reviews Water* 3 (October 2015): 4.

27 The Brahmaputra River, India's longest river, originates in the Chemayungdung Glacier on the slopes of the Himalayas. At its origin in Tibet, the Chinese call it the Yarlung Tsangpo. The river enters India through Arunachal Pradesh at which point it is known as the Siang River. From there it flows into the plains of Assam where it is known as the Dihang River. The river flows for about 35 kilometers before it is joined by the Dibang and the Lohit Rivers. From here on, it is known as the Brahmaputra.

28 Biba, "Desecuritization in China's Behavior Towards its Transboundary Rivers: The Mekong River, the Brahmaputra River, and the Irtysh and Ili Rivers," 37; and Upali A. Amarasinghe, Tushaar Shah, Hugh Turrall, and B. K. Anand, *India's Water Future to 2025-2050: Business-as-Usual Scenario and Deviations*, *International Water Management Institute - Research Report 123*, (Sri Lanka, 2007): 9.

29 Zhang, "Sino-Indian Water Disputes: The Coming Water Wars?" 4-5.

30 Jinshui Cai, "Da xixian' yinggai shang" [Great Western Route Must Be Executed], *Kexue juece* [Scientific Decision-making], December 16, 2016, cited in Holslag, "Assessing the Sino-Indian Water Dispute," 25.

31 The name of the book is *Saving China Through the Water from Tibet* [Xizang zhi shui jiu Zhangguo], cited in Holslag, "Assessing the Sino-Indian Water Dispute," 25.

task force, and asserted the GWWDP is “not technically feasible in the foreseeable future, and given the development trajectory of China, it is neither practical nor necessary.”³²

These conflicting indicators have led to an ongoing debate over the true intentions of Chinese water diversion plans for its western route. Meanwhile, China officially announced plans to build a network of up to five massive dams on the Yarlung Tsangpo River for the purpose of generating hydroelectricity—not water diversion. In Fall 2014, it completed construction of the Zangmu Dam, the first of these hydropower dams along the Yarlung Tsangpo River. Many in India believe these hydropower dams are the first step in the process to construct the additional infrastructure needed to divert water in accordance with the GWWDP.³³

While it does not appear likely China will go through with its water diversion plan due to cost and engineering difficulties, there is growing concern Beijing will change course if its current water-diversion plans do not resolve its growing water-scarcity problem. Should China proceed, it would increase tensions with India. This dynamic is all the more worrisome when one examines the linkage between the Brahmaputra River and national sovereignty.

Driving Factor #3: Sino-Indian Dispute over Arunachal Pradesh

The area in which China's Yarlung Tsangpo River becomes India's Brahmaputra River is called the Arunachal Pradesh. Both China and India claim this region. This territorial dispute is all the more sensitive because it is linked to the sovereignty of both countries. China cannot give up its claim without simultaneously weakening its claim of sovereignty over Tibet, which it took by force in 1950. For India, the Arunachal Pradesh is the site of a humiliating defeat by the Chinese in 1962.

From China's perspective, political control over Tibet is a matter of sovereignty, territorial integrity, and security. The Chinese Communist Party (CCP) claims China's sovereignty over Tibet traces back 700 years to the Yuan (Manchu) Dynasty.³⁴ Furthermore, the CCP perceives its sovereignty over Tibet as an essential part of restoring China's national pride and security. After the fall of the Qing Dynasty in 1911, Great Britain exploited China's weakened condition by recognizing Tibet as an independent state and negotiating new borders. Shortly after the Qing Dynasty fell, the government of India, which was still a colony of Great Britain at the time, hosted a meeting between its representatives and

32 Holslag, “Assessing the Sino-Indian Water Dispute,” 26; and Zhang, “Sino-Indian Water Disputes,” 5.

33 The argument that China may ultimately divert the Brahmaputra River headwaters is widely reported in Indian news media. For a good review of the arguments both for and against China's commitment to diverting the headwaters, see Jonathan Holslag, “Assessing the Sino-Indian Water Dispute,” Hongzhou Zhang, “Sino-Indian Water Disputes,” and “South Asia's Water: Unquenchable Thirst,” *The Economist*, November 19, 2011; Lowe and Silvester, “Water Shortages Threaten Global Security,” 45; Ananth Krishnan, “China Puts First Brahmaputra Dam into Operation,” *India Today*, November 23, 2014, <http://indiatoday.intoday.in/story/brahmaputra-dam-india-vs-china-zangmu-yarlung-tsangpo-zangbo-hydropower-project/1/403379.html>; and Ramachandran, “Water Wars.”

34 Sperling, Elliot. “Tibet and China: The Interpretation of History Since 1950,” *China Perspectives* 2009, no. 3 (September 2009): 26.

those from Great Britain and Tibet in Simla, India. There, they drew up the borders of a newly independent Tibet in the Simla Accord of 1914.³⁵

This agreement created two sets of borders between India and Tibet, one on either side of Nepal. The western border, known as the Johnson Line, divided Kashmir from Tibet, and the eastern border, called the McMahon Line, divided Arunachal Pradesh from Tibet. Both lines were named after British diplomats.³⁶ China refused to acknowledge the agreement because it claimed Tibet was still part of China at the time and did not have the authority to make international agreements.³⁷ In fact, the Chinese leadership determined recognition of the Simla Accord, and its McMahon Line, would imply Tibet was an independent state with treaty-making powers. This status would undermine the legitimacy of China's centuries-long claim of sovereignty over Tibet.³⁸

In this manner, the Arunachal territorial dispute became linked to a core issue—China's claim of sovereignty over Tibet. Once China invaded and occupied Tibet in 1950, both the Johnson Line and the McMahon Line became contested borders between India and China.



China-India Border with Arunachal Pradesh Outlined³⁹

The Arunachal Pradesh is also the scene of the 1962 Sino-Indian War during which China wrested more than 20,000 square kilometers of territory from India and inflicted heavy casualties.⁴⁰ Since then, the

35 Ramachandra Guha, "The Dalai Lama's War," *The National Interest* 115 (September/October 2011): 47; and Sikri, "The Tibet Factor in India-China Relations," 59; and Sikri, "The Tibet Factor in India-China Relations," 60.

36 Bruce Riedel, "JFK's Overshadowed Crisis," *The National Interest* 120 (July 2012): 55.

37 In fact, during the Chinese Civil War, both the Kuomintang Nationalists and the CCP claimed all of Tibet as part of China. See Michael Clarke, "Ethnic Separatism in the People's Republic of China: History, Causes and Contemporary Challenges," *European Journal of East Asian Studies* 12, no. 1 (2013): 112.

38 Sikri, "The Tibet Factor in India-China Relations," 60.

39 "South Asia's Water Unquenchable Thirst."

40 The Indian government acknowledged the loss of more than 7,000 personnel—with 1,383 dead, 1,696 missing in action, and 3,968 captured. See Gyanesh Kudaisya, "Beyond the 'Himalayan Pearl Harbor,'" *History Today* 62, no. 11 (Nov 2012): 3.

dispute over the Arunachal Pradesh remains a point of contention in Sino-Indian relations and serves as a potential trigger for renewed military conflict despite a period of warming relations and increased trade between the two countries.⁴¹

Even before President Hu's historic visit to India in 2006, the Chinese ambassador to India made a statement on an Indian news channel asserting Beijing's claim to the entire Arunachal Pradesh area, casting a shadow over Hu's visit.⁴² To further emphasize this point, China refused to give a visa to a visiting Indian official from Arunachal Pradesh on the grounds that, as the region was a part of China, the official did not need a visa.⁴³ In 2009, China refused to endorse an Asian Development Bank project in Arunachal Pradesh on the grounds that the area for the project was in China.⁴⁴

Meanwhile, India continues a steady military build-up in and around the Arunachal Pradesh. In 2008, when Indian Prime Minister Manmohan Singh visited the province, he announced a major infrastructure development package, and appointed a retired army chief of staff to the post of governor. In 2009, India deployed an additional 60,000 soldiers to Assam, near Arunachal Pradesh, bringing the total number of troops in the area to 100,000. It also built three new airfields in the Himalayan foothills. In 2014, India announced plans to build 54 border posts in Arunachal Pradesh. Meanwhile, China has heavily invested in improving its military infrastructure in Tibet, establishing "five fully operational air bases, several helipads, an extensive rail network, and 36,000 miles of roads—giving them the ability to rapidly deploy 30 divisions (approximately 15,000 soldiers each) along the border, a 3-to-1 advantage over India."⁴⁵

In addition to the military build up on both sides of the border, incursions into disputed areas are common. The Indian government reported, from 2012-2015, Chinese soldiers conducted 600 incursions into disputed areas along the India-China border.⁴⁶ In recent years, the Chinese-Indian border has become an increasingly dangerous hotspot,

41 From the 1980s to recently, India and China entered into a period of detente highlighted with the signing of the "Declaration of Principles for Relations and Comprehensive Cooperation" in 2003 and then the "India-China Strategic and Cooperative Partnership for Peace and Prosperity" in 2005. Despite this, the territorial dispute over the Arunachal Pradesh remained unresolved. See Sikri, "The Tibet Factor in India-China Relations;" and Sujit Dutta, "Revisiting China's Territorial Claims on Arunachal," *Strategic Analysis* 32, no. 4 (July 2008).

42 Jing-Dong Yuan, "The Dragon and the Elephant: Chinese-Indian Relations in the 21st Century," *The Washington Quarterly* 30, no. 3 (Summer 2007): 138. Also in 2007, the Chinese Foreign Minister Yang Jieshi reiterated the PRC's claim on Arunachal Pradesh during his talks with the Indian External Affairs Minister Pranab at the sidelines of the G-8+5 meeting in Germany, see Dutta, "Revisiting China's Territorial Claims on Arunachal," 556.

43 Sikri, "The Tibet Factor in India-China Relations," 64; and Kerry Bolton, "Water Wars: Rivalry Over Water Resources," *World Affairs* 14, no. 1 (Spring 2010): 56.

44 Sanjeev Miglani, "India, China Take a Measure of Each Other at Border Row Talks," *Reuters*, August 5, 2009, <http://blogs.reuters.com/india/2009/08/05/india-china-take-a-measure-of-each-other-at-border-row-talks/>.

45 Dutta, "Revisiting China's Territorial Claims on Arunachal," 572; Selina Ho, "River Politics: China's Policies in the Mekong and the Brahmaputra in Comparative Perspective," *Journal of Contemporary China* 23, no. 85 (2014): 14; Bolton, "Water Wars," 61; Ben Blanchard, "China Expresses Concern about Indian Plan to Build Border Posts," *Reuters*, October 30, 2014, <http://www.reuters.com/article/2014/10/30/us-china-india-idUSKBN01J14G20141030>; and Mohan Malik, "Victory Without Bloodshed: China's India Strategy," *The Diplomat*, August 20, 2013.

46 Ibid. The Indian government routinely tracks and reports incursions by Chinese military patrols into various disputed areas India administers and which China claims. This number covers all of these areas, not just Arunachal Pradesh.

the net result of this military build up, aggressive patrolling, and border incursions.

Driving Factor #4: Increasing Political Instability in China

China is facing growing domestic political instability due to an economic slowdown and rising popular nationalism, making it increasingly difficult for the CCP to pursue national interests objectively in a non-confrontational manner, especially with issues linked to national sovereignty and quality of life. In the case of water scarcity, and especially with the case of the Brahmaputra River, both of these dimensions are present. As water scarcity in China grows, the CCP will find it harder to ignore the cries for more-drastic solutions, such as diverting the Brahmaputra River and other transnational rivers, to alleviate the suffering of its people. And, because the Brahmaputra River flows through a disputed area, the CCP's ability to make decisions in a collaborative manner with its neighbors will become even more important.

China's Slowing Economy

Ever since the economic reforms ushered in by Deng Xiaoping in the 1980s, the CCP has focused on promoting economic growth to build its national power and to maintain its legitimacy as China's ruling political party. This concentration resulted in tremendous economic growth and rising living standards, but it also increased the income gap between rich and poor, the expectations by the Chinese people for better services, and environmental degradation.⁴⁷

But now, China's gross domestic product growth is slowing, and an increasing number of analysts are worried China will enter a prolonged period of slower growth—or an outright recession. This result would severely test the CCP's ability to deal with environmental issues, such as water scarcity, increased social unrest, and rising popular nationalism. A major contributing factor to China's declining economy is the tremendous growth of non-government debt and overcapacity China has accumulated since the 2008 Global Financial Crisis.

In response to the 2008 crisis, the Chinese government announced a major fiscal stimulus package and adopted measures to relax monetary policy.⁴⁸ A main component of this effort was to encourage local governments to increase funding for infrastructure and public works projects.⁴⁹ In order to raise these funds, local governments looked to the commercial sector to fund public projects by establishing Local Government Financing Platforms, which are treated as municipal State Owned Enterprises under Chinese law.⁵⁰

Local Government Financing Platforms focus primarily on public-welfare projects such as affordable- housing construction, infrastructure

47 Randall Peerenboom, "China and the Middle-Income Trap: Toward a Post Washington, Post Beijing Consensus," *Pacific Review* 27, no. 5 (2014): 663.

48 Yinqiu Lu and Tao Sun, "Local Government Financing Platforms in China: A Fortune or Misfortune?" *International Monetary Fund Working Paper*, 13/243 (October 2013): 8.

49 Chaoying Qi, James Juniper, and James Xiaohe Zhang, "'Minsky Moment' and Financial Fragility: The Case of China," *The Journal of Developing Areas* 49, no. 6 (April 2015): 286; and Gang Fan and Yan Lv, "Fiscal Prudence and Growth Sustainability: An Analysis of China's Public Debts," *Asian Economic Policy Review* 7, no. 2 (December 2012): 207-208.

50 Fan and Lv, "Fiscal Prudence and Growth Sustainability," 203.

development, social services, and environmental protection. To finance these projects, local governments provide Local Government Financing Platforms with capital through the direct transfer of government revenue, land-use rights, or other real-property assets such as roads and bridges.⁵¹ Local Government Financing Platforms then use this capital as collateral to obtain the financing they need from Chinese banks to finance the projects the local governments want them to execute.

This relationship between local government, Local Government Financing Platforms, and state-owned banks has produced far more capacity than is demanded by foreign and domestic markets in housing, steel, cement, construction, iron, and other goods. More than one in five homes in China's urban areas are vacant. At the macro level, China's real-estate activity is as much as 20 percent of the gross domestic product. To put this in perspective, at the height of the US real-estate market prior to the 2008 crisis, real estate was six percent of the US gross domestic product. As an indicator of over-investment in construction projects, China used more cement in 2011-2013 than the United States did in the entire 20th century.⁵²

Not surprisingly, this rising overcapacity has coincided with extraordinary growth in China's commercial debt-to-GDP ratio which, in 2015, exceeded 200 percent of the gross domestic product, almost double the 125 percent reported in 2008.⁵³ When coupled with government debt, China's total debt-to-GDP ratio approached 300 percent, according to a 2015 report by McKinsey Consulting.⁵⁴ Small wonder that on March 3, 2016, Moody's downgraded its outlook on Chinese debt from "stable" to "negative."⁵⁵

This over-capacity and debt has slowed China's GDP growth rate. Its nominal GDP growth rate declined from more than 15 percent in 2011 to around seven percent in 2014, but many analysts believe the actual figure was closer to four percent.⁵⁶ This slowdown is problematic in terms of political stability due to the growing income gap in China, an uncomfortable irony for a party whose originating ideology was based on communism. Between 2008 and 2010, the Chinese government dealt with more than 90,000 protests annually.⁵⁷ As the economy continues to slow and social unrest rises, the government will need to resort to nationalism to maintain political stability. This action, however, will entail its own risks, especially in the realm of foreign policy.

51 Lu and Son, "Local Government Financing Platforms in China," 4.

52 Vague, "The Coming China Crisis," 17; and Ibid., 21.

53 Ye Xie, "China's Debt-to-GDP Ratio Just Climbed to a Record High," *Bloomberg Business News*, July 15, 2015, <http://www.bloomberg.com/news/articles/2015-07-15/china-s-debt-to-gdp-ratio-just-climbed-to-a-new-record-high>.

54 Richard Dobbs, Susan Lund, Jonathan Woetzel, and Mina Mutaftchieva, "Debt and (Not Much) Deleveraging," *McKinsey Global Institute Report* (February 2015): vi.

55 "Moody's Cuts China Outlook on Eve of NPC, Cites Reform, Fiscal Risks," *Reuters*, March 3, 2016, <http://in.mobile.reuters.com/article/idINKCN0W408K?irpc=932>.

56 Vague, "The Coming China Crisis," 22; and Qi, Juniper, and Zhang, "Minsky Moment," 279.

57 Elizabeth C. Economy, "Roots of Protest and the Party Response in China," Testimony before US-China Economic and Security Review Committee, First Session, 112th Congress, February 25, 2011.

Rising Popular Nationalism in China

Ever since the capitalist reforms under Deng Xiaoping, the CCP has based its legitimacy on economic growth and nationalist ideology. In fact, up until the mid-1990s, the party was able to “decide the direction, content, and intensity of Chinese nationalism, and then to mobilize the people...[it] could appeal to nationalism whenever it so wished, and dismiss it whenever it needed to shift its policy.”⁵⁸

A slowing economy and rising popular nationalism are impacting a leadership that is more exposed to public opinion than ever before, and constraining the ability of China’s political elites to coolly pursue China’s national interests. The CCP originally supported this rising wave of popular nationalism in the 1990s, when a series of incidents contributed to the perception the West (with Japan included) harbored ill intentions toward China: the selling of advanced fighter planes to Taiwan; the search of a Chinese cargo ship; opposition to China’s bid to host the 2000 Olympics; the accidental bombing of a Chinese embassy in Kosovo; and Japanese claims on the Diaoyu Islands, denouncing China in the name of human rights, and the deployment of aircraft carriers in the vicinity of the Taiwan Strait.⁵⁹

In the past, when rising popular nationalism threatened national interests, Chinese leaders applied pragmatic controls, at times constraining or promoting depending on the national and political interests at stake. For example, at the height of the 2005 anti-Japanese demonstrations, the Chinese government took measures to halt them because the growing size and publicity of the protests influenced the government’s foreign policy interest in maintaining productive relations with Japan.⁶⁰ In the words of a prominent Chinese scholar, “Talking tough but acting in a calculated manner helped Chinese leaders prevent the rise of popular nationalism from damaging China’s relations with the United States and Japan.” The CCP also took steps to halt anti-US demonstrations after the 1999 accidental bombing of the Chinese embassy in Kosovo, as well as the 2001 mid-air collision between a US EP-3 and a Chinese jet fighter in the South China Sea.⁶¹

China’s ability to exert this pragmatic control of popular nationalism has declined since the 2008 global financial crisis and the slowdown of China’s economy. As Chinese elites lose the ability to leverage economic growth to maintain legitimacy, they will become more unwilling, or even unable, to control popular nationalism. China’s current president and party leader, Xi Jinping, is particularly exposed to nationalist opinion because of the way he has consolidated power. Prior to assuming office as president in 2012, he witnessed the “collective presidency” which distributed power across the CCP Standing Committee and constrained

58 Zemin Chen, “Nationalism, Internationalism, and Chinese Foreign Policy,” *Journal of Contemporary China* 14, no. 42 (February 2005): 50.

59 Peter Hays Gries, “Chinese Nationalism: Challenging the State?” *Current History* (September 2005): 252; and Chen, “Nationalism, Internationalism, and Chinese Foreign Policy,” 50.

60 Shuisheng Zhao, “Foreign Policy Implications of Chinese Nationalism Revisited: The Strident Turn,” *Journal of Contemporary China* 22, no. 82 (2013): 540.

61 Ibid., 542; and Ibid., 540. Actions by the CCP to tamp down Chinese protests concerning Japanese claims over the Diaoyu Islands are another example of the central government’s ability to constrain nationalism when needed. See also Phillip C. Saunders and Erica S. Downs, “Legitimacy and the Limits of Nationalism: China and the Diaoyu Islands,” *International Security* 23, no. 3 (Winter, 1998-1999): 139.

then-President Hu Jintao's influence so completely he was nicknamed the "woman with bound feet." To reverse this, Xi surrounded himself with "a shadow cabinet that was defined less by a single ideology than by school ties and political reliability."⁶²

Xi has limited collective leadership and marginalized traditional institutions of governance, and he relies on a small group of advisors who are more loyal than experienced. The National Security Commission, for example, is led by two figures loyal to Xi, but who have little foreign policy experience. And with regard to foreign policy decision-making, Xi has reduced the roles of the State Council, the Foreign Ministry, and the military.⁶³ He has consolidated so much power, he is personally at the center of every major policy decision, and is arguably China's most authoritarian leader since Mao.⁶⁴

Because Xi established such clear dominance in the national decision-making process, it has left him with near-total responsibility for the government's economic policies. As these policies continue to prove ineffective in reversing China's declining economic growth, Xi becomes more exposed to popular nationalism as he will have to "address countless domestic challenges for which he is now explicitly accountable," and a major misstep on any of them could be costly to his political popularity and position.⁶⁵

As Xi and his small group of policymaking elites continue to grapple with declining economic growth and rising social unrest, concerns over political instability will become a driving factor for foreign policy. "For this reason, Xi will most probably stimulate and intensify Chinese nationalism—long a pillar of the state's legitimacy—to compensate for the political harm of a slower economy, to distract the public, to halt rivals who might use nationalist criticisms against him, and to burnish his own image."⁶⁶ This is evidenced by his development of an image as an assertive strongman, not unlike that of President Putin to whom Xi reportedly said in 2013, "We are similar in character."⁶⁷

As water scarcity continues to grow in China due to over-consumption, climate change, and pollution, rising popular nationalism will pressure the CCP to seek drastic solutions. Water diversion of rivers originating in Tibet will become more attractive to the detriment of China's relations with its downstream neighbors.

Conclusion

This article examined a diverse set of factors when assessing the relationship between water insecurity and war. It is not enough to focus purely on the dynamics of how water is shared, how water scarcity is growing, or how the overall natural environment is deteriorating. War, as a human and a political endeavor, is a more complex matter.

62 Evan Osnos, "Born Red," *The New Yorker* (April 6, 2015).

63 Robert D. Blackwill and Kurt M. Campbell, "Xi Jinping on the Global Stage: Chinese Foreign Policy Under a Powerful But Exposed Leader," *Council on Foreign Relations Special Report* 74 (February 2016): 6.

64 Evan Osnos, "Born Red."

65 Blackwill and Campbell, "Xi Jinping on the Global Stage," 10.

66 Ibid., 4.

67 Evan Osnos, "Born Red."

Consequently, water scarcity, by itself, will most likely not lead to war. However, water insecurity when coupled with other factors, such as increasing water scarcity at the source of transnational rivers, threatening behavior by the upstream state, overlapping linkages between water insecurity and national sovereignty, and decreasing political stability in the upstream state, will increase the likelihood of war. In the case of China and India, all these conditions exist.

So why should the Department of Defense care? It should care because history has shown the United States could be drawn into a war between these two powers. On November 19, 1962, when the Sino-Indian War was at its worst point for India, Prime Minister Nehru wrote two letters to President Kennedy describing India's situation as desperate and requesting comprehensive military aid. He specifically asked for a minimum of 12 squadrons of supersonic fighters, radar support, and US Air Force personnel to man them.⁶⁸ Although the United States did not provide direct air support to India, probably having to do with the timing of the request being on the heels of the Cuban Missile Crisis, it did send C-130s, laden with military equipment and ammunition, and dispatch the USS Enterprise to a nearby location.⁶⁹

The Department of Defense should also recognize Tibet's impact to regional security as it becomes the strategic high ground of Asia for fresh water due to increasing glacier melt; growing water consumption in China, South Asia, and Southeast Asia; and increasing pressure for China to divert water away from its downstream neighbors. While this article covered these issues with regard to China and India, the same lessons learned can apply to countries in Southeast Asia.

As water becomes increasingly sought after among states in that region, and even around the globe, it is time for the United States and the Department of Defense to elevate environmental security issues to a level on par with national security interests such as countering WMD proliferation and preventing attacks on the homeland. It is increasingly important to promote confidence-building measures between certain states to ensure military missteps do not aggravate territorial sovereignty issues like the one over the Arunachal Pradesh. Finally, it is time for the Department of Defense to invest in more water purification/treatment capabilities so it is not focused only on sustaining the health of US and coalition forces, but also on mitigating water shortage crises.

68 Kudaisya, "Beyond the 'Himalayan Pearl Harbor,'" 4.

69 Riedel, "JFK's Overshadowed Crisis," 56.

