
Climate Change, Water Scarcity, and the Potential for Interstate Conflict in South Asia

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Climate Change, Water Scarcity, and the Potential for Interstate Conflict in South Asia

Abstract

Ever since American security analysts began to consider the impact of global warming on international security, water has been viewed as an especially critical factor. In many parts of the developing world, water supplies are already insufficient to meet societal requirements, and, by shrinking these supplies further, climate change will cause widespread hardship, unrest, and conflict. But exactly what role water plays in this equation has been the subject of considerable reassessment over time. When analysts first examined warming's impacts, they largely assumed that climate-related water scarcities would most likely provoke conflict *within* nations; only later did analysts look closely at the possibility of conflicts arising *between* states, typically in the context of shared river systems. This risk appears particularly acute in South Asia, where several highly-populated countries, including China, India, and Pakistan, rely on river systems which depend for part of their flow on meltwater from the Himalayan glaciers, which are contracting as a result of climate change. In the absence of greater efforts by these countries to address this peril in a collaborative, equitable manner, looming water shortages could combine with other antagonisms to trigger armed conflict, possibly entailing the use of nuclear weapons.

Introduction

Ever since American security analysts began to consider the impact of global warming on international security, water—or rather, water scarcity—has been viewed as an especially critical factor. In many parts of the developing world, it is thought, water supplies are already insufficient to meet societal requirements, and, by shrinking these supplies further, climate change will cause widespread hardship, unrest, and conflict. This understanding of water's centrality in the climate change-conflict equation continues to underlie U.S. assessments of warming's impacts on international security. However, exactly what role water plays in this equation has been the subject of considerable investigation over the years.

When American security analysts first examined warming's impact on the global security environment, they largely assumed that climate-related water scarcities would most likely provoke conflict *within* nations, not between them. As rainfall diminished, it was assumed, food production would become more precarious, and various groups within societies, whether defined along class, ethnic, or religious lines, would compete for access to the available supplies; when governments proved incapable of satisfying the mounting demands in an efficient and equitable manner, conflict would erupt.¹ Only later did analysts look closely at the possibility of conflicts arising *between* states over climate-related water scarcities, typically in the context of shared river systems—a quest that would inevitably lead them to the dangers posed by water competition in South Asia.

The evolution of strategic thinking on water's role in precipitating conflict can be traced through examination of some of the key documents in the field. Serious study of the topic began in the middle of the first decade of this century, when analysts in both the military and intelligence communities undertook the earliest assessments of warming's impacts on national and international security. Two seminal documents arose from these efforts: *National Security and the Threat of Climate Change*, published by the CNA Corporation (formerly the Center for Naval Analyses) in 2007, and the *National Intelligence Assessment on the National Security Implications of Global Change to 2030*, submitted to Congress by the National Intelligence Council (NIC) in June 2008.

The 2007 report, written by staff members at CNA with the assistance of a Military Advisory Board made up of retired generals and admirals, placed resource scarcity at the center of its analysis, coining the term “threat multiplier” to describe warming’s impact on the security equation in poor, deeply divided societies.² “Many governments in Asia, Africa, and the Middle East are already on edge in terms of their ability to provide basic needs: Food, water, shelter, and stability,” it explained. “Projected climate change will exacerbate the problems in these regions and add to the problems of effective governance.” As governments fail and conflict breaks out among competing factions, the U.S. military may be called upon to deliver aid and restore stability. “Weakened and failing governments,” the report stated, “foster the conditions for internal strife [and] extremism.” Accordingly, “the U.S. may be drawn more frequently into these situations to help to provide relief, rescue, and logistics, or to stabilize conditions before conflicts arise.”³

The 2007 CNA report had a significant impression on U.S. military thinking at the time, both because of the prestige of CNA’s Military Advisory Board—prominent members included General Gordon R. Sullivan, former Chief of Staff of the Army, and General Anthony C. Zinni, former commander of the U.S. Central Command (CENTCOM)—and because its conclusions accorded well with the observations of many officers who had been deployed in food and water scarce areas of Asia, Africa, and/or the Middle East. For many of them, the notion of climate change as a “threat multiplier,” adding to the resource stresses they were already witnessing, made perfect sense.⁴

While the CNA Corporation was undertaking its study, elements of the U.S. Intelligence Community (IC), spearheaded by the Central Intelligence Agency (CIA) and the NIC, were conducting their own investigation of warming’s impact on global security. This resulted in the publication of a National Intelligence Assessment on the topic and a summary report of its contents by Dr. Thomas Fingar, the NIC’s Deputy Director, before the House Permanent Select Committee on Intelligence on June 25, 2008. Like the authors of the CNA report, Fingar identified climate-induced resource scarcity as the most worrisome outcome of global warming. As global temperatures rise and rainfall declines in many areas, he testified, global warming will devastate agriculture in many areas of the developing world, resulting in widespread misery and discontent:

For many developing countries, reduced agriculture output can be devastating as agriculture represents a large share of their economy, a majority of their populations rely on subsistence farming, and their governments and people have less adaptive capacity.⁵

When governments fail to overcome these challenges in a fair and effective manner, he added, unrest and conflict could erupt, “particularly over access to increasingly scarce water resources.”⁶

This perception of resource scarcity (especially of water) as the pivotal impact of climate change on international security, combined with the threat multiplier concept, was gradually absorbed into official U.S. military doctrine. The U.S. Department of Defense (DoD), in its *Quadrennial Defense Review Report* (QDR) for 2010, alluded to the 2008 National Intelligence Assessment (NIA) by noting that “assessments conducted by the intelligence community indicate that climate change could have significant geopolitical impacts around the world,” including by “contribut[ing] to food and water scarcity and through “the further weakening of fragile governments.”⁷ It also borrowed from the CNA’s assessment by stating, “While climate change alone does not cause conflict, it may act as an accelerant of instability or conflict, putting a burden on governments around the world.”⁸ On this basis, the Armed Services were instructed to work with the militaries of friendly nations to enhance their capacity to respond to extreme climate events.⁹

In the years that followed, this summary of warming’s impacts on global security permeated official U.S. thinking on the subject. “Climate change is an urgent and growing threat to our national security,” the DoD told Congress in a 2015 memorandum, “contributing to increased natural disasters, refugee flows, and conflicts over basic resources such as food and water.”¹⁰ For example, similar statements were included in speeches by Secretary of Defense Chuck Hagel in 2013 and 2014,¹¹ and in an October 2015 speech at Stanford University by National Security Advisor Susan E. Rice.¹²

In almost all such statements, water—or rather, water scarcity—was viewed as a pivotal factor in identifying countries’ vulnerability to the effects of

climate change, posing a significant threat of instability and conflict. Typically, moreover, military analysts assumed that any such conflict arising from water security would occur within states, presumably between competing factions and ethnic groups. This was widely seen to be the case, for example, in fighting between pastoralists and farmers in the Sahel region of Africa, where recurring drought has significantly diminished water supplies for local groups, exacerbating long-simmering tensions among them.¹³ “The genocide in Darfur began, in part, as a drought-driven conflict,” Rice asserted in her 2015 Stanford speech. “In Nigeria, prolonged drought contributed to the instability and dissatisfaction that Boko Haram exploits.”¹⁴

The Prospect of Interstate Conflict over Water

Water scarcity continues to figure in DoD studies of the links between climate change and conflict, but analysts’ assumption that fighting over scarce water supplies would be confined to *intrastate* conflict has been challenged over time. This was first evident in an Intelligence Community Assessment (ICA) prepared by the Defense Intelligence Agency (DIA) in 2012. Released to the public as *Global Water Security*, the 2012 ICA reaffirmed the centrality of water in international security affairs but raised the specter of water conflicts arising between as well as within states. As in earlier IC reports, the 2012 ICA concluded that water issues, in combination with pre-existing factors like poverty and social discord, could contribute to internal unrest and state failure.¹⁵ However, the report went on to consider a range of circumstances in which such issues could also provoke tensions and conflict between states.

Interstate conflict over water might occur, the ICA indicated, when several states rely on a shared river system for much of their water supply and one or more of the riparian states sought to maximize the river’s flow for their own benefit at the expense of other states in the basin, amplifying any scarcities already present there. “We judge that as water shortages become more acute beyond the next ten years, water in shared basins will increasingly be used as leverage,” the ICA stated. An upstream state enjoying superior control over a river’s flow might exploit its advantage, say, to extract advantage in international negotiations or to attract international aid for infrastructure projects. As the ICA further noted, “...we assess that states will also use their inherent ability to construct and

support major water projects to obtain regional influence or preserve their water interests.”¹⁶

The utilization of a state’s superior position in a shared river system to extract political or economic advantage can prove especially destabilizing, the ICA suggested, when weaker states in the system (typically the downstream countries) are especially vulnerable to water scarcity because of long-standing social, economic, and political conditions. Without identifying any particular states by name, the study suggested that this could occur when downstream states suffer from endemic corruption, poor water management practices, and systemic favoritism when it comes to the allocation of scarce water supplies. In such cases, any reduction in the flow of water by an upstream country could easily combine with internal factors in a downstream country to provoke widespread unrest and conflict. “Water shortages, and government failures to manage them, are likely to lead to social disruptions, pressure on national and local leaders, and potentially political instability,” the report noted.¹⁷

Although most discussion of the climate and water security nexus has continued to emphasize the risk of internal conflict arising from warming-related water scarcities, some analysts have pursued the line of inquiry introduced by the 2012 ICA, focusing on interstate tensions arising within shared river basins. This was a prominent theme, for example, of a 2013 study conducted by the National Research Council (NRC) on behalf of the IC. Entitled *Climate and Social Stress: Implications for Security Analysis*, the 2013 NRC report sought to better identify the links between global warming, pre-existing social vulnerabilities, and the likelihood of conflict. While it echoed earlier studies by the CNA and NIC in identifying internal factors like poverty, ethnic discord, and governmental ineptitude as likely pre-conditions for climate-related conflict, it also examined dangers arising from dependence on shared river systems, especially in cases where cooperation among the riparian powers in managing the system is limited and global warming is expected to reduce future water flows.¹⁸

For the NRC, the river systems of greatest concern in this respect were those that originate in the Himalayan Mountains and depend, for a significant share of the annual flow, on meltwater from the Himalayan glaciers. These glaciers are an important source of meltwater for many of Asia’s major rivers, including the Indus, Ganges, Brahmaputra, and

Mekong Rivers. These rivers originate in China but travel through India, Pakistan, Nepal, Bangladesh, Laos, Cambodia, Thailand, and Vietnam—countries with a combined population of over 3.4 billion people, or approximately 44 percent of the world’s total population.¹⁹ A large share of the population in these countries depends on agriculture for its livelihood, so ensuring access to adequate supplies of water is a prime local and national priority. During the monsoon season, heavy rains provide these rivers with abundant water, but during dry seasons they are dependent on glacial meltwater—and, with the rise in global temperatures, the Himalayan glaciers are melting, jeopardizing future water availability in these river basins. Given a history of ethnic and social discord within many of these countries and long-standing tensions among them, analysts fear that such shortages could aggravate both internal and external tensions and ignite interstate as well as intrastate conflict.²⁰

As was the case of previous IC-initiated studies, the authors of the 2013 NRC report were reluctant to identify specific countries in their findings, referring again to “countries of security concern” or other such euphemisms. However, they did select one of these countries in particular: Pakistan. They chose that country for special analysis, the report indicated, because “Pakistan presents a clear example of a country where social dynamics and susceptibility to harm from climate events combine to create a potentially unstable situation.”²¹ Pakistan was said to suffer from multiple risk factors: Its economy is largely dependent on agriculture; much of the water used for irrigation purposes comes from just one source, the Indus River; control over the allocation of irrigation waters is often exercised by privileged elites, leaving millions of Pakistanis vulnerable to water shortages; and much of the water flowing into the Indus comes from China or from tributaries originating in India, leaving Pakistan in an unfavorable (downstream) position in the system. These conditions have led, in the past, to internal squabbles over water rights and to tensions with India over control of the Indus; now, with the likelihood of diminished meltwater from the Himalayan glaciers, the risk of water scarcity triggering violent conflict of one sort or another becomes that much greater.²²

Pakistan, the Indus, and U.S. Security

There is no doubt that Pakistan is considered by U.S. security analysts as a “state important to U.S. national security interests,” the term used by the Defense Intelligence Agency to describe countries of concern in the 2012 ICA on water. Not only is Pakistan a critical—if not always wholehearted—partner in the global war on terror, but it also possesses a substantial arsenal of nuclear weapons whose security is a matter of enormous concern to American leaders.²³ Should those munitions wind up with rogue elements of the Pakistani military (some of whose members are believed to maintain clandestine links to radical Islamic organizations), or even worse, should Pakistan descend into civil war and the weapons fall into untrustworthy or hostile hands, the safety of India and other US allies—as well as of American forces deployed in the region—would be at grave risk.²⁴ Ensuring Pakistan’s stability therefore, has long been a major U.S. security objective, prompting regular deliveries of American arms and other military aid. Yet, despite billions of dollars in American aid, Pakistan remains vulnerable to social and ethnic internal strife.²⁵

As noted, farming is the principal economic activity in Pakistan, and ensuring access to water is an overarching public and government concern. This means, above all, managing the use of the Indus—the country’s main source of water for irrigation and its major source of power for electricity generation. Pakistan’s rising population and growing cities, with their rings of factories, are placing an immense strain on the Indus, leading to competition between farmers, industrialists, and urban consumers. With water and power shortages becoming an increasingly frequent aspect of daily life, public protests—sometimes turning violent—have erupted across the country. In one particularly intense bout of rioting, following a prolonged power outage in June 2012, protestors burned trains, blocked roads, looted shops, and damaged banks and gas stations.²⁶

However bad things might be in Pakistan today, climate change is likely to make conditions far worse in the years ahead. Prolonged droughts, climate scientists believe, will occur with increasing regularity, posing a severe threat to the nation’s agricultural sector and further reducing the supply of hydroelectric power. At the same time, warming is expected to increase the intensity of monsoon downpours, resulting in massive flooding (as occurred in 2010) and the loss of valuable topsoil, further adding to

Pakistan's woes. As the Himalayan glaciers melt, moreover, water flow through the Indus will diminish.²⁷ With the competition for land and water resources bound to increase and with Pakistan already divided along ethnic and religious lines, widespread civil strife will become ever more likely, possibly jeopardizing the survival of the state.

It is impossible to predict exactly how the United States might respond to a systemic breakdown of state governance in Pakistan. One thing is clear, however: At the earliest sign that the country's nuclear weapons are at risk of falling into the hands of hostile parties, the American military would respond with decisive force. In fact, research conducted by the nonpartisan Nuclear Threat Initiative (NTI) has revealed that the Joint Special Operations Command (JSOC) and specialized Army units have been training for such contingencies for some time and have deployed all the necessary gear to the region. In the event of a coup or crisis, the NTI revealed, "U.S. forces would rush into the country, crossing borders, rappelling down from helicopters, and parachuting out of airplanes, so they can secure known or suspected nuclear-storage sites." Recognizing that any such actions by American forces could trigger widespread resistance by the Pakistani army and/or various jihadist groups, the U.S. Central Command, which has authority over all American forces in the region, has developed plans for backing up JSOC personnel with full-scale military support.²⁸

Another scenario that has some analysts worried is the possibility that a time of sharply reduced water flow through the Indus will coincide with efforts by India to exploit its advantageous position as the upper riparian on three key tributaries of the Indus—the Ravi, the Beas, and the Sutlej—to divert water for its own use, thereby depriving downstream Pakistan of vital supplies and provoking a war between these two countries. India was granted control over the three tributaries under the Indus Water Treaty of 1960, and various Indian leaders have threatened at times to dam the rivers or otherwise reduce their flow into Pakistan as a reprisal for Pakistani attacks on Indian bases in the disputed territory of Kashmir (through which the tributaries flow); this, in turn, has provoked counter-threats from Pakistani leaders.²⁹ What analysts fear most, in such a situation, is that India, possessing superior conventional forces, would overpower Pakistan's equivalent armies, leading Pakistan's leaders to order the use of nuclear weapons against India, igniting a regional nuclear

war. Such a conflict, scientists have calculated, would result in 50 to 125 million fatalities, and produce a dust cloud covering much of the Earth, decimating global agriculture—an outcome with enormous implications for American national security.³⁰

China, India, and the Brahmaputra River

The potential for interstate conflict—even nuclear conflict—over shared water supplies arises in the case of another major river at risk from climate change: The Brahmaputra, which originates in China and traverses much of northeastern India before merging with the Ganges in Bangladesh and emptying into the Bay of Bengal. The fifth-largest river in the world by volume of water flow, the Brahmaputra starts on the northern slopes of the Himalayas and flows easterly across the southern Tibetan plateau (where it is known as the Yarlung Tsangpo) before making a nearly 180-degree turn and crossing into the Indian state of Arunachal Pradesh; from there, it flows in a southwesterly direction towards its confluence with the Ganges and thence its exit into the Bay of Bengal. For the Chinese, the Brahmaputra is an important engine of hydroelectric power; they have already installed one dam on the river, at Zangmu, and have announced plans for at least three more. For the Indians, it is a valuable source of irrigation water, especially in agriculture-dependent regions of the northeast. Leaders of both countries are fully aware of their counterparts' interests and concerns over the river but have made little effort to reach a mutual understanding—let alone any formal agreements—regarding its future development.³¹

Several factors make the future status of the Brahmaputra a matter of deep concern to security analysts. To begin with, the river enters India through the state of Arunachal Pradesh, an area of northeastern India abutting Tibet that is claimed by both countries. Beijing insists that this region was once part of the kingdom of Tibet, and so belongs to China; New Delhi claims it is a legitimate part of India under a 1914 treaty between Tibet and Great Britain. The two sides fought a war here in 1962, with India suffering significant battlefield setbacks but China agreeing to restore the status quo ante. The countries have not been able to resolve the ownership dispute in subsequent years, despite intermittent negotiations, and both continue to maintain substantial military forces in the region. To this day, discord over

Arunachal Pradesh remains a continuing source of friction in Sino-Indian relations and a potential spark for violent conflict.³²

Another potential source of friction between China and India arises from Chinese plans (or rumors of such plans) to divert water from the upper Brahmaputra and funnel it via a series of tunnels and canals to northeastern China, where existing supplies are hugely inadequate.³³ While dismissed by many Chinese experts as overly ambitious and costly, the notion of diverting water from the Brahmaputra has generated considerable anxiety in India, where experts fear that the resulting decline in water flow into the Indian section of the river would threaten agricultural productivity. Given the centrality of farming in the Indian economy and political system, any Chinese move to proceed with such a diversion project could lead to increased tension between the two countries.³⁴

Few analysts believe that a Sino-Indian conflict over the Brahmaputra is likely in the years immediately ahead. Both countries have strong motives for maintaining friendly—if not necessarily, warm—relations between them, and water issues have not yet dominated the bilateral agenda. This, however, is where global warming enters the picture. The Brahmaputra, like the Indus, draws much of its flow during dry seasons from the melting of Himalayan glaciers—and these, as has already been noted, are melting as a result of climate change, and could eventually disappear. For both China and India, the melting of the Himalayan glaciers will have momentous consequences. Given the Brahmaputra's critical importance to agriculture and economic activity in both countries, any significant long-term decline in its flow would be highly disruptive, causing widespread hardship and social unrest.³⁵

Under these more stressful conditions, the Chinese leadership, desperate to provide additional supply to China's water-starved northeast, might be more inclined to proceed with water diversion projects on the Brahmaputra and other shared river systems.³⁶ Coming at a time of equivalent water scarcity in India, such an effort is almost certain to trigger a harsh Indian response. "The most salient climate-related point of conflict [between China and India] could be China's move to divert the upstream waters of rivers originating in the Himalayan watershed," the NIC warned in a special report on climate change and India. "If China was

determined to move forward with such a scheme, it could become a major element in pushing China and India towards an adversarial rather than simply a competitive relationship. Border clashes related to control of the rivers are not out of the question.”³⁷

Any conflict between China and India over the waters of the Brahmaputra, should one occur, is most likely to remain a localized affair, without provoking a full-scale mobilization of forces on both sides. During the 1962 war over Arunachal Pradesh, Chinese army troops engaged their Indian counterparts in disputed areas along the border, but neither side escalated to large-scale combat. However, once fighting breaks out, it is impossible to predict the succeeding chain of events, and any outcome is conceivable. A minor skirmish along the Indo-Chinese border might not be a cause for alarm in the United States, but a larger war between those two countries undoubtedly would be. Both are armed with nuclear weapons, and Washington views India as a strategic counterweight to China.³⁸ A crushing defeat of India would be viewed as a potential threat to American national interests and might conceivably precipitate U.S. military intervention. Where that might lead is anyone’s guess, but the mere possibility of such combat has made this scenario a matter of deep concern for security analysts in Washington.³⁹

Conclusion

As noted in this article, most analyses of water’s role in the climate-conflict nexus emphasizes the likelihood that warming-related scarcities will exacerbate pre-existing antagonisms within poor and divided states, leading to *internal* conflict and state collapse. Nevertheless, some analysts have considered the possibility that water shortages could also lead to conflict *between* states, notably if the countries involved depend to a considerable extent on a shared river system and if one of the riparian states—typically, the upstream country—diverts the river’s flow for its own benefit at the expense of downstream countries.

This risk appears particularly significant in South Asia, where several highly-populated countries rely on a number of major rivers which depend for a significant part of their flow on meltwater from the Himalayan glaciers—large frozen reservoirs of water that are contracting as a result of climate change. In the absence of greater efforts by these countries to

address this peril in a collaborative, equitable manner, looming water shortages could combine with other antagonisms to trigger armed conflict, possibly entailing the use of nuclear weapons. As any such conflict—even those fought without nuclear weapons—would cause widespread chaos and economic turmoil, it behooves U.S. leaders to work with their counterparts in China, India, and Pakistan to promote greater collaboration in the management of their shared water resources.

Endnotes

- ¹ CNA Corporation, *National Security and the Threat of Climate Change* (Alexandria, VA: CNA, 2007), 6, 13-15, 18-34.
- ² CNA, *National Security and the Threat of Climate Change*, 6.
- ³ CNA, *National Security and the Threat of Climate Change*, 44.
- ⁴ For confirmation of this assessment by officers from CENTCOM and other regional commands, see U.S. Department of Defense (DoD), “National Security Implications of Climate-Related Risks and a Changing Climate,” Submitted in response to a request contained in Senate Report 113-211, accompanying H.R. 4870, the Department of Defense Appropriations Bill, 2015, July 23, 2015, 3, <https://archive.defense.gov/pubs/150724-congressional-report-on-national-implications-of-climate-change.pdf>.
- ⁵ Office of the Director of National Intelligence (ODNI), *National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030*, Statement for the Record of Dr. Thomas Fingar, Deputy Director of National Intelligence for Analysis, House Permanent Select Committee on Intelligence, June 25, 2008, 14, https://fas.org/irp/congress/2008_hr/062508fingar.pdf.
- ⁶ ODNI, *National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030*, 5.
- ⁷ DoD, *Quadrennial Defense Review Report*, February 2010 (QDR 2010) (Washington, D.C.: DoD, 2007), 85.
- ⁸ See note 7 above.
- ⁹ See note 7 above.
- ¹⁰ DoD, “National Security Implications of Climate-Related Risks and a Changing Climate,” 3.
- ¹¹ DoD, “Secretary of Defense Speech: Halifax International Security Forum (DoD Arctic Strategy),” November 22, 2013, <https://archive.defense.gov/speeches/speech.aspx?speechid=1821>; DoD, “Secretary of Defense Speech: Conference of Defense Ministers of the Americas,” Arequipa, Peru, October 13, 2014, <https://www.defense.gov/Newsroom/Speeches/Speech/Article/605617/>.
- ¹² White House, Office of the Press Secretary, “Remarks by National Security Advisor Susan E. Rice on Climate Change and National Security at Stanford University,” October 12, 2015, <https://obamawhitehouse.archives.gov/the-press-office/2015/10/12/remarks-national-security-advisor-susan-e-rice-climate-change-and>.
- ¹³ CNA, *The Role of Water Stress in Instability and Conflict* (Alexandria, VA: CNA, 2018).
- ¹⁴ White House, “Remarks by National Security Advisor Susan E. Rice.”
- ¹⁵ ODNI, *Global Water Security*, Intelligence Community Assessment, ICA 2012-08, February 2, 2012, 3, https://www.dni.gov/files/documents/Special%20Report_ICA%20Global%20Water%20Security.pdf.
- ¹⁶ ODNI, *Global Water Security*, 3-4.

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- ¹⁷ ODNI, *Global Water Security*, 3.
- ¹⁸ National Research Council (NRC), Committee on Assessing the Impacts of Climate Change on Social and Political Stresses, *Climate and Social Stress: Implications for Security Analysis* (Washington, D.C.: National Academies Press, 2013).
- ¹⁹ NRC, *Climate and Social Stress*, 102-103.
- ²⁰ NRC, *Himalayan Glaciers: Climate Change, Water Resources, and Water Security* (Washington, D.C.: National Academies Press, 2012). See also J.M. Maurer, J.M. Schaefer, S. Rupper, and A. Corley, "Acceleration of Ice Loss Across the Himalayas over the Past 40 Years," *Science Advances* 5, no. 6 (June 19, 2019): 1-12, <https://advances.sciencemag.org/content/advances/5/6/eaav7266.full.pdf>.
- ²¹ NRC, *Climate and Social Stress*, 122.
- ²² NRC, *Climate and Social Stress*, 122-25.
- ²³ Arms Control Association, "Nuclear Weapons: Who Has What at a Glance," Updated July 2019, accessed May 27, 2020, <https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat>.
- ²⁴ Shaun Gregory, "The Terrorist Threat to Pakistan's Nuclear Weapons," *CTC Sentinel*, Combating Terrorism Center at West Point, July 2009, accessed May 27, 2020, <https://ctc.usma.edu/the-terrorist-threat-to-pakistans-nuclear-weapons/>.
- ²⁵ K. Alan Kronstadt, *Pakistan-U.S. Relations: Issues for the 114th Congress* (Washington, D.C.: Congressional Research Service, May 14, 2015). See also Richard Haas, *A World in Disarray* (New York: Penguin Books, 2017), 128-30, 183-85. Some of this aid was suspended in 2018 by President Trump, who claimed the Pakistanis were not doing enough to curb Taliban forces based in areas along the Pakistan-Afghanistan border. See Mujib Marshal and Salman Masood, "U.S. Cuts Off Pakistan, Gambling in Afghan War," *New York Times*, January 6, 2018.
- ²⁶ NRC, *Climate and Social Stress*, 122-23.
- ²⁷ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, Part B: Regional Aspects (New York and Cambridge: Cambridge University Press, 2014), 1327-370.
- ²⁸ Jeffrey Goldberg and Marc Ambinder, "The Pentagon's Secret Plans to Secure Pakistan's Nuclear Arsenal," Nuclear Threat Initiative, November 9, 2011, accessed May 27, 2020, <https://www.nti.org/gsn/article/the-pentagons-secret-plans-to-secure-pakistans-nuclear-arsenal/>.
- ²⁹ Zia Mian, "Kashmir, Climate Change, and Nuclear War," *Bulletin of the Atomic Scientists*, December 7, 2016, accessed May 27, 2020, <https://thebulletin.org/2016/12/kashmir-climate-change-and-nuclear-war/>.
- ³⁰ Owen B. Toon et al, "Rapidly Expanding Nuclear Arsenals in Pakistan and India Portend Regional and Global Catastrophe," *Science Advances*, 5, no. 10 (October 2, 2019): 1-14, <https://advances.sciencemag.org/content/advances/5/10/eaay5478.full.pdf>.
- ³¹ Nilanthi Samaranyake, Satu Limaye, and Joel Wuthnow, *Water Resource Competition in the Brahmaputra River Basin: China, India, and Bangladesh* (Arlington, VA: CNA Corp., 2016).
- ³² Samaranyake, Limaye, and Wuthnow, *Water Resource Competition in the Brahmaputra River Basin*, 141-97.
- ³³ These plans were first discussed in *Tibet's Waters Will Save China*, a 2005 book by Li Ling, a former officer in China's People's Liberation Army. Samaranyake, Limaye, and Wuthnow, *Water Resource Competition*, 23. See also Chellaney, *Water: Asia's New Battleground* (Washington, D.C.: Georgetown University Press, 2013), 161-65.
- ³⁴ Samaranyake, Limaye, and Wuthnow, *Water Resource Competition*, 15-16, 21-24, 39, 43-46; 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/>.
- ³⁵ NRC, *Himalayan Glaciers*, 73-92.
- ³⁶ Samaranyake, Limaye, and Wuthnow, *Water Resource Competition in the Brahmaputra River Basin*, 23.

-
- ³⁷ NIC, *India: The Impact of Climate Change to 2030, Geopolitical Implications*, Conference Report 09-07 (Washington, D.C.: NIC, 2019), 25.
- ³⁸ Haass, *A World in Disarray*, 125-26, 183-85, 264-65.
- ³⁹ In 2014, for example, the CNA Corporation conducted a crisis simulation involving water disputes in South Asia. Catherine M. Trentacoste, E.D. McGrady, Shawna Cuan, and Nilanthi Samaranayake, *Bone Dry and Flooding Soon: A Regional Water Management Game* (Arlington, VA: CNA, 2014).