

An aerial photograph of a river valley. A wide, light-colored river winds through the center of the valley. On the left bank, there is a small village with several houses and green fields. The surrounding hills are covered in dense green forest. The sky is clear and blue.

HYDROPOLITICS IN THE INDUS BASIN

***THE INDUS WATER TREATY & WATER MISMANAGEMENT IN
PAKISTAN***

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Introduction:

Pakistan could be water scarce by 2025.¹ In recent months, this prediction has generated headlines and galvanized the country as a whole. However, this is not new information; the UN, IMF, and Pakistan Council for Research in Water Resources (PCRWR) have been deliberating potential water scarcity for the past few years.²

The fact that the seriousness of this danger was not well known within the Pakistani populous for so long is unsurprising, as the warnings of water security experts have been largely ignored.³ But today—primarily due to three events that occurred this past year—the water crisis seems to be getting the attention that it deserves. First, Pakistan’s Permanent Indus Commission objected to the Kishanganga hydroelectric project initiated by Indian Prime Minister Narendra Modi on grounds that it violated the Indus Water Treaty. Simultaneously, the Pakistan Council of Research in Water Resources predicted that Pakistan could “run dry” by 2025. Both of these events catalyzed public outcry and brought the severity of the situation into mainstream discussion.⁴ These first two events then culminated in the most tangible representation of the urgency of the water crisis: The Supreme Court of Pakistan and the Prime Minister of Pakistan Diامر-Bhasha created the Mohmand Dams Fund — an attempt initiated by the Chief Justice of Pakistan to crowdsource \$14 billion for the construction of a large dam.⁵

These events successfully created awareness amongst the public regarding the severity of the crisis Pakistan faces. At the same time, this awareness has led to the spread of rampant misinformation about the nature of the water crisis. The general public has yet to understand what the water crisis is, how it is to be defined, what its causes are, and where the solutions lie. This paper will attempt to remedy this.

The paper will be structured based on our findings regarding the following three questions:

¹ Wasif, Sehrish. “Pakistan may run dry by 2025: study.” *The Express Tribune*. May 30, 2016. <https://tribune.com.pk/story/1112704/pakistan-may-run-dry-2025-study/>

² Kugelman, Michael. “Water Scarcity,” *Dawn*. Jun 19, 2018. <https://www.dawn.com/news/1414710>

³ Ibid.

⁴ Mustafa, Danish. “Exactly how doomed are we?” *Daily Times*. Aug 9, 2018. <https://dailytimes.com.pk/280434/exactly-how-doomed-are-we/>

⁵ Ahmad, Meher. “Pakistan Tries A New Way To Pay For A Dam: Crowdsourcing.” *The New York Times*. Oct 5, 2018. <https://www.nytimes.com/2018/10/25/world/asia/pakistan-dam-fund.html>

1. What is India's role in Pakistan's water crisis and how effective are the existing mechanisms, namely the 1960 Indus Waters Treaty, in safeguarding Pakistan's interests?
2. What *is* and what is *not* the water crisis — how to define exactly the causes, components, and realities of Pakistan's true water crisis?
3. What steps should be taken by all stakeholders that will contribute to improving the understanding, management, and distribution of water resources?

Part One of this paper will address international transboundary water sharing challenges in the Indus Basin between Pakistan and India. After the Uri attacks in September 2016, Indian Prime Minister Narendra Modi made a provocative statement targeted at Pakistan claiming that “Blood and water cannot flow together”.⁶ Sartaj Aziz, the then de-facto foreign minister of Pakistan at the time, emphatically replied by saying that any attempts by India to revoke or quell the flow of water into Pakistan can be taken as an “act of war.”⁷ Two years later, the Kishenganga inauguration on the Jhelum river played into these pre-existing dispositions. An atmosphere of fear was created in Pakistan through a widespread perception that India possesses the ability to stop water flow into Pakistan through their projects. Our findings will show that this is merely a *perceived* crisis as the legal mechanisms in place for transboundary water sharing between the countries are strong enough to ensure Pakistan's complete water security.

Part Two will detail the true nature of Pakistan's domestic water crisis. Based on our findings, we will examine the substance behind Pakistan Council of Research in Water Resources prediction that Pakistan could “run dry” by 2025 by analyzing the historical, structural, and macro-economic deficiencies in domestic water resource management and policy.⁸ It is here that we identify the *real* crisis and formally define Pakistan's water crisis, identify its causes and components.

Part Three uses the analysis and evidence presented in the paper to make recommendations on how to best move forward with India through the mechanisms outlined in the Indus Water Treaty (IWT) as well as addressing the domestic structural deficiencies in Pakistan's water resource management. We hope that the discussion in this paper will contribute towards practical policy discourse on tangible structural, legal, and normative measures stakeholders in the region can undertake in the hope for introducing new approaches to understanding the water crisis and positing long-term solutions for Pakistan.

⁶ Mohan, Vishwa. “Blood and water can't flow together: PM Narendra Modi gets tough on Indus treaty.” Sep 27, 2016. <https://timesofindia.indiatimes.com/india/Blood-and-water-cant-flow-together-PM-Narendra-Modi-gets-tough-on-Indus-treaty/articleshow/54534135.cms>

⁷ Aziz, Sataj. “Revocation of Indus Waters Treaty Can Be Taken as an Act of War.” Dawn. Sept 27, 2016. <https://www.dawn.com/news/1286437/revocation-of-indus-waters-treaty-can-be-taken-as-an-act-of-war-sartaj-aziz>

⁸ Wasif, Sehrish. “Pakistan may run dry by 2025: study.” The Express Tribune. May 30, 2016. <https://tribune.com.pk/story/1112704/pakistan-may-run-dry-2025-study>

But before launching into this inquiry, we turn to the basin itself.

Indus Basin Overview

The Indus River is Pakistan's lifeline. Originating from Tibet in the upper reaches of the Himalaya, the river moves through Indian-controlled Kashmir (a disputed territory) and finally enters its most dependent area, across the international boundary into downstream Pakistan.⁹ It flows through the fertile plains of Punjab and then Sindh, eventually draining into the Arabian Sea.



STRAITS TIMES GRAPHICS

⁹ United Nations Peacekeeping: "United Nations Military Observer Group in India and Pakistan." United Nations. <https://peacekeeping.un.org/en/mission/unmogip>

The British expanded the irrigation network in sheer size and scale to the point where the Indus Basin in Pakistan is the largest irrigation network in the world, accounting for seventy-one percent of the country's territory.¹⁰ The Basin is directly responsible for the employment of nearly half of Pakistan's labor force and a quarter of the gross domestic product.¹¹ Given the size, magnitude, and dependence Pakistan places on the basin, it would be difficult to overemphasize the importance of the Basin in the security calculus of the country.

Part One: Indo-Pak Transboundary Water Challenges

The most significant addition to the political framework of Indus Basin was the signing of the Indus Waters Treaty, 1960, between Pakistan, India, and the World Bank.¹² The Treaty established how waters in the Indus Basin are to be shared between the two countries, established technical engineering parameters for construction projects, and outlined a dispute resolution mechanism in case of differences from either side. It is here that we will begin our discussion.

Salient Issues in Indo-Pak Water Relations:

- The Indus River encapsulates a host of sensitivities for Pakistan's national security apparatus. By flowing through Indian-administered Kashmir, India has theoretical control over the water flow and timing as they are up stream of Pakistan. Given the adversarial relationship between the two countries, Pakistan has always viewed the Indus River through a security lens and consequently views Indian projects a potential threat to the country's security.
- Many in Pakistan's political and security elite believe their security concerns regarding Indian encroachments on the Indus are valid due to the burden of history. India stopped water flow into Pakistan on April 1, 1948.¹³ For the first (and only) time, India had demonstrated their willingness and ability to control water flow into Pakistan. This heightened the state's insecurity as it became evident that the lifeline of Pakistan's economy—the Indus River—was at the mercy of a hostile Indian government. The act defied the natural geography of the Indus Basin, leaving the newly-formed Pakistani state with the acute realization that it had to guarantee access to the waters of the Indus river system. For many in the Pakistani bureaucratic elite, the memory of April 1, 1948, is still

¹⁰ "Indus Water Basin: geography, population and climate war." Aquastat.

http://www.fao.org/nr/water/aquastat/basins/indus/indus-CP_eng.pdf

¹¹ Briscoe, John et. al. 2005. "Pakistan's water economy: running dry" Washington, DC: World Bank.

<http://documents.worldbank.org/curated/en/989891468059352743/Pakistans-water-economy-running-dry>. Pp 89.

¹² Sattar, Erum et. al. "Evolutions of Water Institutions in the Indus Basin: Reflections from the law of the Colorado River." University of Michigan Journal of Law Reform, Volume 51, Issue 4, 2018. Aug 23, 2017. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3023589

¹³ Gilmartin, David. "Blood and Water: The Indus River Basin in Modern History." University of California Press. 2015. Pp 206.

alive, giving rise to paranoia concerning Indian projects on Pakistani rivers. Subsequently, Pakistan tends to view Indian projects through a security lens.

- The Indian government itself has politicized the 1960 Indus Waters Treaty. In 2016, Modi infamously said that “blood and water cannot flow together.”¹⁴ A few weeks later on the banks of the Ravi, he said that he “would not let a drop of the Ravi flow into Pakistan.” Some reports indicated that India was even reconsidering their participation in the Treaty.¹⁵ This inevitably brought all Indian projects on Pakistani rivers under political scrutiny and caused people in Pakistan to be overly skeptical about India’s role in Pakistan’s water crisis.
- Pakistan has been particularly concerned regarding two Indian projects: the Baglihar and Kishenganga hydroelectric dams. Both have become highly emotive issues for Pakistan as there is a perception that India can affect the timing and flow of water into Pakistan using these structures.

Before delving into the substance of these issues, it is imperative to understand how history shaped the water sharing arrangements between the two countries.

Making Nature Conform to the Territorial Nation — Partition and its Aftermath

The partition of the Indian subcontinent divided the Indus Basin between India and Pakistan. The Radcliffe Commission’s 1947 demarcation of the border drew a line over the largest contiguous gravity flow irrigation system in the world.¹⁶ The political leaders at the time were all too aware of this and used their influence to gain strategic advantages for their respective countries. This was especially true for the manner in which Punjab—the most important province at the time of partition given its central role in Indian politics—was partitioned. The Commission deviated from their duty to fairly and impartially draw the boundary between India and Pakistan a day or so before the announcement of the official land award because of one reason: water.

Radcliffe’s private secretary at the time of partition, Christopher Beaumont, revealed that Britain’s last viceroy, Lord Mountbatten, was apparently goaded into action by Indian leader Jawaharlal Nehru, who pressured him to alter the first draft of the land demarcation.¹⁷ We now know that the

¹⁴ Mohan, Vishwa. “Blood and water can’t flow together: PM Narendra Modi gets tough on Indus treaty.” Sep 27, 2016. <https://timesofindia.indiatimes.com/india/Blood-and-water-cant-flow-together-PM-Narendra-Modi-gets-tough-on-Indus-treaty/articleshow/54534135.cms>

¹⁵ Mohan, Vishwa. “Uri Attack Response: PM Modi To Take Stock of Indus Waters Treaty.” NDTV. Sep 26, 2016. <https://www.ndtv.com/india-news/uri-attack-response-pm-modi-to-take-stock-of-indus-water-treaty-1466307>

¹⁶ Sattar, Erum et. al. “Evolutions of Water Institutions in the Indus Basin: Reflections from the law of the Colorado River.” University of Michigan Journal of Law Reform, Volume 51, Issue 4, 2018. Aug 23, 2017. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3023589. Pp 28

¹⁷ Zafar, Adeel et. al. “Imagining Industan: Overcoming Water Insecurity In The Indus Basin.” Springer International Publishing. Pp 12-13.

division was changed to give India a substantial tract of land - the Zira and Ferozepur sub-districts of Punjab's Ferozepur district. Both were Muslim majority, and thus, should have ordinarily gone to Pakistan. But important infrastructure that controlled the flow of water in the Sutlej river lay in these districts, making them an area of immense strategic importance.¹⁸ In the words of Beaumont, this incident brought "grave discredit on both men" and undermined the legitimacy of the ostensibly impartial Radcliffe Commission.¹⁹ Therefore, the tensions between India and Pakistan predate the very inception of the two states and set the tone for what was to follow.

In the post-partition era, the relationship between people, territory, and state was fragmented. This led to a crisis of legitimacy which caused both states to take measures to establish their undisputed sovereignty. The Indus River directly challenged unified sovereignty by flowing across borders. Pakistan had territorial sovereignty over the river, whereas India, as the upper riparian, ensured its absolute sovereignty through control of the headworks infrastructure. Controlling water flows within national territory was essential to establishing legitimate state sovereignty. In this light, "controlling water" revealed the contradictions the partition had engendered by attempting to make nature conform to the political boundaries.

The Water Stops

The most overt example of an exercise of control occurred on April 1, 1948. After the expiration of a standstill water-sharing agreement between India and Pakistan, India unilaterally stopped water flow into Pakistan.²⁰ Ironically, it used the very headworks India had covertly procured from Pakistan in the Mountbatten meetings pre-partition to do so. The Ferozepur headworks stopped the water coming into Pakistan from the Dipalpur canal as well as the upper Bari Doab Canal. India's action left 5.5% of the sown area and almost 8% of the cultivable land in West Pakistan at the time without water.²¹ It also became an issue of provincial rhetoric for the Punjabi middle class as the impact was most visibly felt in the province's cultural capital of Lahore, whose population saw a barren canal in the heart of the city. As *The Pakistan Times* editorialized, in the five weeks without water, "what should have been green fields" had "shimmered barrenly in the merciless sun." When "water gurgled" once again in the canal on May 5, the paper reported that the "great excitement of the Lahori people" was palpable as they "flocked" the canal bank.²²

Overnight, Pakistan and its people understood what it meant to be the lower riparian. The country was now all too aware of the fact that India possessed the ability to create a water shortage in the

¹⁸ Ibid.

¹⁹ Kaushik RK, "How Ferozepur Became Ours." Times of India, 19 April 2016. <https://timesofindia.indiatimes.com/india/how-ferozpur-became-ours/articleshow/469742>.

²⁰ Gilmartin, David. "Blood and Water." University of California Press. 2015. Pp 206.

²¹ Ibid

²² Rehman, Nida. "From Artifact to Site: Understanding the Canal in the City of Gardens." Master's thesis, Massachusetts Institute of Technology. 2009.

country at will. It was at this critical juncture that Pakistan swiftly moved to protect its water rights and security through negotiation with their Indian counterparts.

Pakistan’s Need for Protection — Introducing the Indus Waters Treaty, 1960

While New Delhi insisted that water is no different from any other natural resource within India, Islamabad asserted that the natural flow of rivers across borders produces shared sovereignties. These diverging narratives caused the bilateral talks between Pakistan and India to fail and created a space for the international community to step in and broker an agreement. David Lilienthal, Chairman of the Tennessee Valley Authority, visited the Basin and pushed for the World Bank to take an interest in the dispute and broker talks for its resolution.²³ Under the pretext of the Cold War and increasing Soviet influence in the region, the United States decided to take interest in this dispute. Using its auxiliary economic institution, the World Bank, the Eisenhower administration took a fundamentally challenging role in offering its “good offices” to mediate the water dispute.²⁴ With this, the decade long negotiation process began.

During the initial stages of the negotiations, India originally offered Pakistan control over five rivers. Pakistan rejected this as they felt they should claim all six rivers. As the talks went on, India offered Pakistan fewer concessions, until Pakistan was forced to accept control over only three rivers.²⁵ Thus the Eastern Rivers whose courses run more in India were allocated to India, and the three Western Rivers that primarily run through Pakistan were allocated to Pakistan.

While this negotiation meant that Pakistan had to give three rivers to India, further analysis reveals that Pakistan gained substantially more waters than they lost. All river flows are measured at rim stations in the northernmost monitoring stations. Pakistan extracted this information during the negotiations to understand how much water flowed in each river. The information revealed that Pakistan only gave up 29 Million Acre Feet (MAF) of water at the time in the three Eastern rivers and gained 114 MAF from the Western Rivers.²⁷

However, Pakistan’s major population centers such as Lahore, Bahawalpur, and Multan are more situated towards the Eastern rivers. . The IWT’s sponsor entities (US, UK, and the World Bank) decided to launch an ambitious infrastructure plan to compensate for the loss of the Eastern rivers.²⁸ A new system of barrages, dams, and link canals was intended to be constructed to divert excess water from the Western Rivers to the Eastern rivers. The cost would be borne by

²³ Lilienthal, David. “Another Korea in the Making?” *Colliers*, Aug 4, 1951.

²⁴ Haines, David. “Rivers Divided: Indus Basin Water in the Making of India and Pakistan.” Oxford University Press, 2016, 38

²⁵ Naqvi, Feisal. Personal Interview. 10 August 2018.

²⁷ *Ibid.*

²⁸ “The Indus Basin Development Fund Agreement.” World Bank. Sept 19, 1960.

<http://documents.worldbank.org/curated/en/239781468100481033/pdf/Loan-0266-Pakistan-Indus-Basin-Project-Development-Fund-Agreement.pdf>

governments around the world, including India. However, this plan was delayed for nearly ten years as talks dragged on.

In the latter half of the negotiations, Pakistani officials switched their position from claims over river waters to discussions about the extent of the financial compensation for developmental works on the three rivers Pakistan was losing. Therefore, the bulk of the negotiations were not over Pakistan's water rights, but the amount and scope of the aid package Pakistan was to receive for the construction of these development works. This is most succinctly articulated by Aloys Michel, a seminal writer on the Indus Basin, who noted that the final Treaty was appropriately "an Annexure to the Development Fund Agreement rather than vice versa" and that "the Bank and friendly governments, chiefly the United States, had actually purchased an agreement."²⁹

However, what was critical in the agreement from a security perspective was not the developmental assistance, but the manner in which the water was to be shared between India and Pakistan. This, ultimately, was why there was a need for the Treaty in the first place.³⁰ In this regard, the basic dictums of the Treaty can be summarized as follows:

- The waters of the Western Rivers (Indus, Jhelum, and Chenab) would be given to Pakistan and India would be under an obligation to "let flow" their waters (subject to certain specified limitations for domestic, non-consumptive, and agricultural use).
- The waters of the Eastern Rivers (Ravi, Sutlej, and Beas) would be given for use to India exclusively.
- India would be free to construct "run-of-the-river," hydroelectric projects on the Western Rivers (subject to various dam design limitations aimed to restrain India's capacity to affect water flows).
- The Treaty also obligated both countries to regularly exchange data regarding flow and utilization of the waters and constitute a Permanent Indus Commission that serves as a regular channel of communication on matters related to the implementation of the Treaty.³¹

To say that the Treaty established a mechanism for "water sharing" or "cooperation" would be false. The Treaty effectively divided the Indus River into two independent segments: The Eastern and Western Rivers. India was not allowed to make large storage projects on these rivers or impact the flow and timing of water coming into Pakistan. In this regard, Pakistan's immediate security concerns were resolved as the Treaty ensured their protection.

Evaluating the Success of the Indus Waters Treaty

²⁹ Michel, Aloys, "The Indus Waters." Pp 254.

³⁰ Naqvi, Feisal. Personal Interview. August 10, 2018.

³¹ 1960 Indus Waters Treaty, Available at:

<https://siteresources.worldbank.org/INTSOUTHASIA/.../IndusWatersTreaty1960.pdf>

The Indus Waters Treaty, signed in 1960 after almost a decade of negotiation, is considered to be “the world’s most successful water treaty.” The treaty has remained intact for over fifty years and survived three Indo-Pakistani wars.³² While there exists no doubt that it has been successful, we will address the various complexities and intricacies of the Treaty and its implementation.

We will evaluate the success of the Treaty using three metrics. First, we will analyze the technical issues that have arisen in the Treaty by using the Baglihar and Kishenganga hydroelectric projects as case studies. Next, we will look at the normative impacts of the Treaty through its politicization, securitization, and perception in both countries. Finally, given that the treaty has not been revised since 1960, we will attempt to analyze whether or not it is structurally sound in the 21st century and attempt to shed some light on what the future may hold.

Technical Issues

From 1960 to 2002, the Treaty seemed to work effectively. In this time, there were no major disputes between the two countries regarding water. While small issues did arise, such as the Salal and Wullar projects initiated by India, but they tended to subside after both parties stated their respective positions. This changed in 2002 when India started aggressively pushing ahead with the Baglihar and Kishenganga projects.³³

Under the Treaty, all “questions” are first required to be addressed bilaterally by the Indus Waters Commission. If the two sides cannot resolve this, then questions become “differences,” and finally “disputes.” If the two sides cannot resolve a “question” or “difference” bilaterally, they are referred to either a Neutral Expert or an International Court of Arbitration, depending on the nature of the question.³⁴ For example, technical or engineering differences are referred to a Neutral Expert. Other disputes are referred to a Court of Arbitration. In nearly six decades, the options to resolve a “dispute” have only been used twice; once for the Baglihar and the other for the Kishenganga project.³⁵

Baglihar

³² “Avoiding Water Wars: Water Scarcity And Central Asia’s Growing Importance For Stability In Afghanistan And Pakistan.” US Senate Report. Pp 7.
<https://www.foreign.senate.gov/imo/media/doc/Senate%20Print%20112-10%20Avoiding%20Water%20Wars%20Water%20Scarcity%20and%20Central%20Asia%20Afgahnistan%20and%20Pakistan.pdf>

³³ Naqvi, Feisal. “The Kishenganga Conundrum.” Dawn. Nov 18, 2018.
<https://www.dawn.com/news/1445800>

³⁴ Article IX of the 1960 Indus Waters Treaty, Available at:
<https://siteresources.worldbank.org/INTSOUTHASIA/.../IndusWatersTreaty1960.pdf>

³⁵ Naqvi, Feisal. “The Kishenganga Conundrum.” Dawn. Nov 18, 2018.
<https://www.dawn.com/news/1445800>

The first dispute that Pakistan formally litigated related to the Baglihar hydroelectric project and was taken up by Raymond Latiffe who was designated as the Neutral Expert. The most important question was India's usage of low-level outlets.³⁶ In simple terms, the level of an outlet matters because it allows India to drain all the water above the outlet. The act of draining all water in a reservoir is called "drawdown flushing."³⁷ Drawdown flushing's primary role is to clear sedimentation from the reservoir.³⁸ This is done by having low-level outlets. However, the lower the outlet, the greater India's capability to interfere with Pakistan's water flow, and consequently, a greater threat to Pakistan's security.³⁹

The ability to control water flow through low-level outlets is especially relevant in the winter months. The Indus River is unique in the sense that most of its water flows from the months of April to October (the summer) are due to glacier melt and monsoons.⁴⁰ In the winter months of November to March, water flow reduces significantly. Experts in Pakistan stated that the project would deprive Pakistan of 321,000-acre-feet of water during the three months of Rabi season and would have far-reaching consequences for agriculture as well.⁴¹ The project would cause a serious setback to wheat production in Punjab, Pakistan's biggest wheat-producing province. This fear is compounded with the possibility of India constructing a cascade of projects with low-level outlets, as they would have control of Pakistan's water supply.⁴²

India argued that the low-level outlets were a necessary design requirement for sediment control.⁴³ In purely engineering terms, India is correct — low-level outlets are more effective in clearing sedimentation. However, knowing the security implication that low-level outlets cause for the lower riparian, the treaty has ostensible measures against these designs. Subpoint (d) of Paragraph 8 of Annexure D states that outlets "shall be of the minimal size and located at the highest level" consistent with the sound design of the project.⁴⁴ The only time outlets for sediment control could

³⁶ Naqvi, Feisal. Personal Interview. August 10, 2018.

³⁷ F. Fruchard, B. Camenen. "Reservoir Sedimentation: Different Type of Flushing - Friendly Flushing Example of Genissiat Dam Flushing." ICOLD International Symposium on Dams for a Changing World, Jun 2012, Kyoto, Japan. 6 p., 2012.

³⁸ Ibid.

³⁹ Naqvi, Feisal. "The Kishenganga Conundrum." Dawn. Nov 18, 2018. <https://www.dawn.com/news/1445800>

⁴⁰ Akhtar, Shaheen. "Emerging Challenges to the Indus Waters Treaty." <http://www.irs.org.pk/f310.pdf>. Pp 42.

⁴¹ Anwar Iqbal and Khaleeq Kiani. "World Bank's Baglihar verdict may not end dispute, says expert." Dawn. Feb 10 2007. <https://www.dawn.com/news/232302>

⁴² Naqvi, Feisal. Personal Interview. 10 August 2018.

⁴³ Ibid.

⁴⁴ 1960 Indus Waters Treaty, Available at: <https://siteresources.worldbank.org/INTSOUTHASIA/.../IndusWatersTreaty1960.pdf>

be built were in an “unforeseen emergency.” Therefore, Pakistan’s argument to Latiffe was as follows

- a. Low-level outlets are only superior to higher outlets for drawdown flushing — lowering the level of water in a reservoir.
- b. The Treaty prohibits lowering of the reservoir water level except in the case of an “unforeseen emergency.”
- c. Sedimentation does not constitute an unforeseen emergency.
- d. Therefore, the low-level outlets built by India were a violation of the Treaty.

The Neutral Expert rejected Pakistan’s argument and sided with India. Feisal Naqvi, Pakistan’s legal counsel for Baglihar and Kishenganga, believed that Latiffe made several grave errors in his interpretation of the law and the facts of the case. One of these errors was his interpretation of sediment control constituting an “unforeseen emergency:”

“Contrary to popular belief, issues like siltation were known in 1960. Paragraph 8(d) clearly stipulates that outlets are available for sediment control. The people drafting the Treaty were the best engineers that the World Bank could get a hold of. So it’s not like people woke up in 2010 and suddenly realized sedimentation was an issue. It was a known issue with known problems and solutions. How could it then have been an unforeseen emergency?”⁴⁵

The Pakistani legal team failed to convince Raymond Latiffe that sedimentation did not constitute an unforeseen emergency. They then argued that India’s dam design was a violation of the Treaty. They argued that the Treaty had to be seen as part of Pakistan’s broader security concerns. But to the dismay of the legal team, the Neutral Expert was bent on interpreting the Treaty from a purely engineering perspective with a singular focus on the Treaty’s technicalities:

“India wanted to construct its dams in a more ‘modern’ way...integrated management and that sort of thing. My answer was that the Treaty is not about optimization. It is there so that we don’t kill each other in wars so I don’t want you controlling my waters. Build a different design but build them with the minimal ability to control my [Pakistan’s] water. So the point is India needs to build the projects differently. You [India] can’t just say that because we have these dam design in Nepal or China or wherever we will continue to do it this way...[apart from] that there is no dispute within the Treaty except dam design. And the only problems that arise are because of Indian intransigence.”⁴⁶

⁴⁵ Naqvi, Feisal. Personal Interview. 10 August 2018.

⁴⁶ Ibid.

However, Indian officials persisted. They argued that the current design with its low-level outlets was necessary for the “sound design of the project.” They justified this by making a distinction between “operation” and maintenance.”⁴⁷ In simple terms, they argued that low-level outlets for sediment control were necessary for the maintenance of the plant, which, in turn, was essential for the “sound design of the project.” The glaring problem was that the Treaty itself makes no such distinction between “operation” and “maintenance.”

Latiffe ultimately agreed with the Indian position and used the new distinction to justify the low-level outlets. This represented a security risk for Pakistan as drawdown flushing would allow India the ability to control water flow and timing, especially with the large number of projects India was planning to build using the same model.

For these reasons, Mr. Naqvi is of the belief that Pakistan was unlucky with the appointment of Raymond Latiffe as the Neutral Expert.

“We were dealing with a 70-year-old engineer-cum-professor from Switzerland, an upstream country, whose view was that dams are beautiful and large dams are more beautiful and why can’t you [India and Pakistan] just get along. To which we were though ‘how many times do we have to kill each other for you to understand we can’t get along. That’s why we have a Treaty!’”⁴⁸

The Neutral Expert’s judgment sent shockwaves through Pakistan. By ruling in favor of low-level outlets, India had the potential to control the timing and flow of water into Pakistan. It emerged shortly after the award that India was planning to construct 135 dams on the Western Rivers, 24 on the Indus, 77 on the Jhelum, and 34 on the Chenab.⁴⁹ Overnight, the issue was not a minor question about the dam design of one project anymore, but a matter of life-and-death for Pakistan.

Kishenganga

Pakistan tried to contain the fallout of the Baglihar decision by challenging India’s construction of the Kishenganga hydro-electric project on the Jhelum river. As India had similar designs of low-level outlets in Kishenganga, Pakistan could hope to reverse the Baglihar decision *indirectly* by taking up Kishenganga. According to Naqvi, Pakistan attempted to hit “two birds with one stone.”⁵⁰

The Kishenganga project is a run-of-the-river plant designed to divert water from the Kishenganga river to the Jhelum river. After the diversion, the water flows down the Jhelum river and into

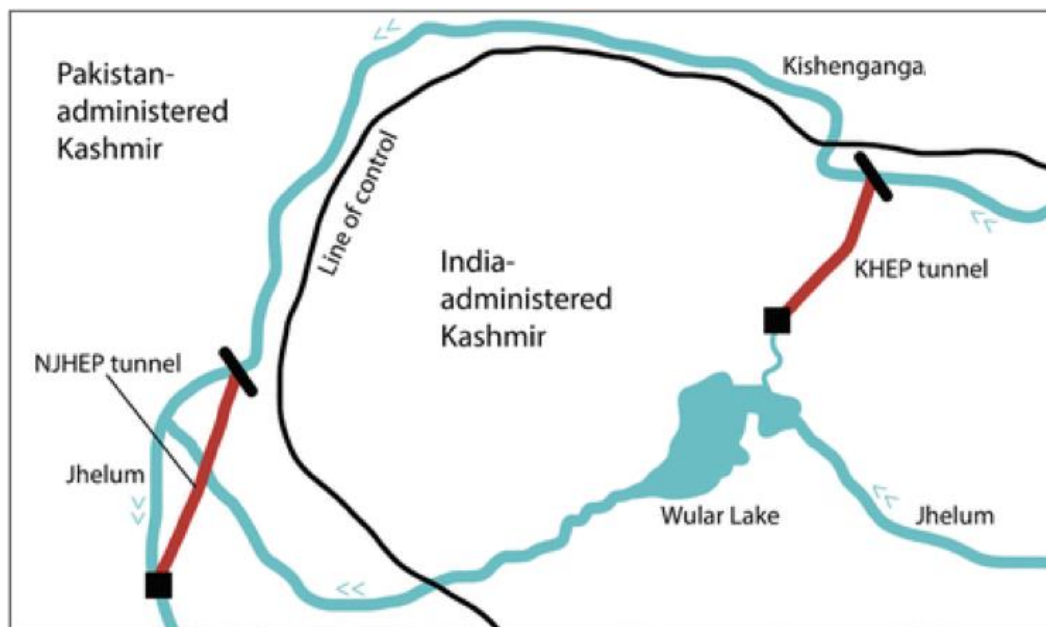
⁴⁷ Ibid.

⁴⁸ Ibid.

⁴⁹ Akhtar, Shaheen. “Emerging Challenges to the Indus Waters Treaty.” <http://www.irs.org.pk/f310.pdf>. Pp 59.

⁵⁰ Naqvi, Feisal. Personal Interview. Aug 10, 2018.

Pakistan (this is shown in the figure below). However, Pakistan believed the project violated the IWT due to engineering issues in its dam design that could supposedly affect Pakistan’s water security.



Pakistan framed two legal questions and four technical questions. The two legal questions were:

1. “Whether India’s proposed diversion of the Kishanganga (Neelum) into another tributary, i.e. the Bonar-Madmati Nullah, being one central element of the Kishanganga Plant, breaches the legal obligations India owes Pakistan under the Treaty, as interpreted and applied in accordance with international law, including India’s obligations under Article III(2) (let flow all the waters of the Western rivers and not permit any interference with those waters”) and Article IV(6) “maintenance of natural channels?”
2. Whether under the Treaty, India may deplete or bring the reservoir level of a run-of-the-river plant below dead storage level in any circumstances except in the case of an unforeseen emergency?

The legal questions affected all Indian projects, whereas the specific technical questions only affected Kishenganga. For this reason, the legal questions were naturally of more importance to Pakistan’s long-term water security.

These legal questions were posed in an International Court of Arbitration (ICA). This was a risky move as the ICA’s ruling would have precedential value, and if it ruled against Pakistan, India would be allowed to construct low-level outlets for all of their future projects. Nevertheless,

Pakistan's legal team was confident that the Baglihar ruling was not grounded on a sound legal basis and would prove to be unsustainable.⁵²

The first question Pakistan posed was solely concerning the Kishenganga project (and not a general question applicable to all projects such as that of drawdown flushing). They asked whether or not the Kishenganga project violated Paragraph 15 (iii) of Annexure D which stipulates that India cannot construct a Plant on the Jhelum river if it adversely affects "the then existing...hydro-electric use by Pakistan." Pakistan argued that since their Neelum-Jhelum hydro-electric dam was conceived before Kishenganga, the project constituted "the then existing use," and therefore made the construction of Kishenganga illegal. However, this question posed problems for the Pakistani legal team.

"Neelum-Jhelum came up in the late 80s, whereas Kishenganga came up in 1996...The Pakistani team was aggrieved by the fact that the ICA rejected evidence that we had started first. The ICA said India started first, and therefore Neelum-Jhelum did not constitute an existing use. My argument was that it was a 'continuous obligation' — this meant that India could use the waters as long as Pakistan was not using them. We referred to the Helsinki rules of 1966 and the London/Barcelona rules of 2004, but the argument failed."

Mr. Naqvi also indicated that the ICA had to give some credence and meaning to a special clause in the Treaty by ruling against Pakistan:

"The further problem was there was an entire chunk of the Treaty that said that India can't touch Pakistani waters, that it had to let the water flow. But then there is one clause which says that you can take a specific tributary of the Jhelum and put it in another tributary. Why was this put in the Treaty? The short answer is that someone had thought of it earlier; it was an exception. To that extent, [the ICA] had to give some meaning to this stupid clause even though it applies to no other project known to humanity."⁵³

However, Mr. Naqvi didn't believe that the ICA ruling on this point was a big blow to Pakistan's overarching concerns regarding security. Average water loss at Neelum-Jhelum was supposed to be 16%, whereas after Kishenganga it would be 10%.⁵⁴ Secondly, the water from the Kishenganga diversion eventually comes to Pakistan. And if the proposed Kohala hydropower project gets constructed, any electricity lost will get be recovered.⁵⁵

⁵² Naqvi, Feisal. Personal Interview. Aug 10, 2018.

⁵³ Naqvi, Feisal. Personal Interview. Aug 10, 2018.

⁵⁴ Naqvi, Feisal. "The Kishenganga Conundrum." Dawn. Nov 18, 2018. <https://www.dawn.com/news/1445800>

⁵⁵ Ibid.

The second legal question was of far greater importance to the long-term water security of Pakistan. Pakistan asked whether or not India was allowed drawdown flushing except in an unforeseen emergency. This question attempted to overturn the verdict in Baglihar, where it was decided that low-level outlets and drawdown flushing were permitted for sedimentation control. According to Mr. Naqvi, there was no need for low-level outlets for the Kishenganga project because there isn't a sedimentation problem on the Kishenganga river:

“Why do you [India] have low-level outlets when you don't have a sedimentation problem...Where Pakistan gets paranoid is when India decides to use low-level outlets when there is absolutely no need for it. According to our research, Kishenganga would last 80 years, if not indefinitely, without any form of sediment control.”⁵⁶

On the question of low-level outlets, the ICA ruled emphatically in Pakistan's favor. They stated that no future Indian project design could include low-level outlets for sediment control as it does not constitute an “unforeseen emergency.” Because of the precedential nature of the ICA's ruling, the Baglihar decision was “grandfathered.”⁵⁷ This meant that the Neutral Expert's decision contained no precedential value and was limited to the Baglihar project. In this regard, the Kishenganga ruling represented an unequivocal win for Pakistan.

However, the ICA's decision was not self-executing, and further steps had to be taken before it could be fully implemented. But solely due to Pakistani negligence, these steps could not be taken.⁵⁸

The four remaining technical questions had to be answered. As mentioned above, the two forums available to India or Pakistan for dispute resolution was either the Neutral Expert or the International Court of Arbitration. Naturally, technical or engineering questions fall within the purview and jurisdiction of the Neutral Expert.

With Pakistan's poor experience with Raymond Latiffe, the Neutral Expert for Baglihar, Pakistan was hesitant to take the remaining four questions to another Neutral Expert. However, this is incorrect as a new Neutral Expert would have been bound by the Kishenganga Award, which ruled in favor of Pakistan. A Neutral Expert appointed for the Kishenganga case would, therefore, not be able to repeat the same mistakes as in Baglihar. Finally, if the Neutral Expert ruled against Pakistan, their decision would only have affected the Kishenganga case, and Pakistan could challenge such an adverse finding in a Court of Arbitration on a legal basis.⁵⁹

⁵⁶ Naqvi, Feisal. Personal Interview. Aug 10, 2018.

⁵⁷ Ibid

⁵⁸ Alam, Rafay. Personal Interview. Aug 10, 2018.

⁵⁹ Naqvi, Feisal. “The Kishenganga Conundrum.” Dawn. Nov 18, 2018.
<https://www.dawn.com/news/1445800>

Instead, Pakistan wanted to immediately take the matter to the ICA, where previously they had greater success. India categorically refused to go to the ICA and rightfully stated that the questions belong within the purview of the Neutral Expert.⁶⁰ This impasse led the World Bank to declare in 2016 that both countries had to agree on the forum. The stalemate that followed has resulted in the Pakistan being unable to capitalize on the Kishenganga Award, and India has since been able to construct the Kishenganga project.

Pakistan's stubborn decision to attempt to go to the ICA instead of the NE baffled Mr. Naqvi.⁶¹ He argued that it made no sense to go the ICA and that it was in Pakistan's interest to accept India's offer and take the matter up with a Neutral Expert.

First, he believed the risk of going to the ICA greatly outweighed the benefits. As stated earlier, the ICA's design has precedential value. Any ruling against Pakistan would not only overturn the Kishanganga Award but apply to all future Indian projects. He explained the Pakistani decision in crude terms as follows:

“Look, Kishenganga has been decided in a favorable manner... why should Pakistan reopen a case they won? In my opinion, it should be India who should want to go the ICA as it benefits them, not us. Pakistan's view is moronic beyond belief.”⁶²

Secondly, he argued that India's refusal to participate in any ICA proceedings would significantly harm the legitimacy of any outcome. He even stated that any ex-parte trial would pressure the Court to “bend over backwards” for India.⁶³

Mr. Rafay Alam, a Lahore-based lawyer who has worked on the Treaty, also believes that Pakistan should have gone to the Neutral Expert, but is confident that they now will:

“It was the first time you could take one issue and plug it into two different forums. The difference is where there is tension. But I think that more powerful vested interests have prevailed, and Pakistan will go to the Neutral Expert.”⁶⁴

In a recent column, Mr. Naqvi succinctly summarized the case as follows: “Imagine a case involving the most sensitive issues of national security possible. Imagine that Pakistan wins a conclusive victory in that case. Now imagine that Pakistan wastes that victory and spends five years blundering about in a dead end. Kishanganga is that case.”

⁶⁰ Bagchi, Indrani. “India Unlikely to Participate in Any Meeting in Washington on Indus Waters Treaty.” The Times of India. March 22, 2017. <https://timesofindia.indiatimes.com/india/india-unlikely-to-participate-in-any-meeting-in-washington-on-indus-waters-treaty/articleshow/57758023.cms>

⁶¹ Naqvi, Feisal. Personal Interview. Aug, 2018.

⁶² Ibid.

⁶³ Naqvi, Feisal. “The Kishenganga Conundrum.” Dawn. Nov 18, 2018. <https://www.dawn.com/news/1445800>

⁶⁴ Alam, Rafay. Personal Interview. Aug, 2018.

The Securitization and Politicization of Water

“It’s India, it’s Pakistan, it’s Kashmir, and it’s water. How much more sensitive can you get?”
— *Feisal Naqvi*

The controversial Baglihar and Kishenganga projects have sparked a passionate debate about India’s role in Pakistan’s water crisis. The “looming” water crisis, Pakistan’s dependence on the Indus Basin for economic security, and vulnerability as lower riparian to further Indian projects all underlie the heated water discourse among farmers, political leaders, and the public at large. Pakistan and India’s seemingly eternal standoff has only sharpened the sense of vulnerability.

The government and political leadership have been quite vocal in voicing their concerns about Indian projects. In October 2008, shortly after India filled the Baglihar dam causing a sharp reduction in the flow of the Chenab river, President Asif Ali Zardari warned that that "Pakistan would be paying a very high price for India's move to block Pakistan's water supply from Chenab River."⁶⁵ He warned India "not to trade important regional objectives for short-term domestic goals."⁶⁶ On 28 January 2009, President Zardari warned in an article in the Washington Post that, “The water crisis in Pakistan is directly linked to relations with India. Resolution could prevent an environmental catastrophe in South Asia, but failure to do so could fuel the fires of discontent that may lead to extremism and terrorism.”⁶⁷ Then Chief Minister of Punjab, Mian Shahbaz Sharif, stated that the water issue had become a serious problem between India and Pakistan.⁶⁸ Earlier, Pakistan's minister for education and former head of the ISI, Javed Ashraf, had warned the Senate in 2005 that the country could go to war with India over the Baglihar controversy.⁶⁹

The Chairman of the Indus Waters Treaty Council, Hafiz Zahoor-ul-Hassan Dahr, has warned that Pakistan could become another Somalia and Ethiopia.⁷⁰ He said the Indian projects were aimed at

⁶⁵ Subramanian, Nirupama. “Violation of the Treaty Will Damage Ties: Zardari.” *The Hindu*. Oct 13, 2008.

⁶⁶ *Ibid.*

⁶⁷ Zardari, Asif Ali. “Partnership with Pakistan.” *Washington Post*. Jan 28, 2009.
<http://www.washingtonpost.com/wp-dyn/content/article/2009/01/27/AR2009012702675.html>

⁶⁸ “Water Issue A Serious Problem, says Shahbaz.” *The News*. Mar 21, 2010.

⁶⁹ Sumbly, Vimal. “Baglihar Project: J&K’s possible entry into ‘power’ zone.” *The Tribune*. Dec 26, 2007.

⁷⁰ “India Plans 52 Projects to Control Pakistan’s Water.” *The Nation*. Mar 30, 2010.
<https://nation.com.pk/30-Mar-2010/india-plans-52-projects-to-control-pakistans-water>

controlling the waters of the Chenab, Jhelum and Indus rivers, were illegal and a clear violation of the Indus Waters Treaty.⁷¹

Our research has found no reason to suggest that the Treaty fails in guaranteeing Pakistan's security. The outstanding problems with the Treaty are purely *technical* in nature, as we have discussed above. These are “engineering problems with engineering solutions.”⁷² Consequently, there is a public relations program: the technical nature of the Treaty is not understood by the vast majority of the population or even the political elite. The outstanding technical problems are all related to the dam designs of run-of-the-river projects (such as that of Kishenganga and Baglihar). However, the majority of these technical issues have now been resolved. All Pakistan needs to do now is take the remaining questions of Kishenganga to a Neutral Expert, and all outstanding technical issues in the Treaty will be put to rest.

It is critical that Pakistan stops conflating the technical aspect of the Treaty with broader security concerns. The two issues are mutually exclusive and should be treated as such. However, the powerful security establishment of Pakistan continues to needlessly interfere with transboundary water issues.⁷³ By conflating the Treaty with broader concerns of national security, the establishment undermines the autonomy and independence of the Commission.

Rafay Alam talked to us about his experiences with the security establishment and the level to which they are involved in transboundary water issues. Mr. Alam worked on the Treaty between 2008 and 2010 when he was teaching at Lahore University of Mangamant Sciences a leading research university. He took part in an Indus Basin Transboundary Review. He recounted his experience during his interview:

“The Indus Basin Transboundary Review was a straightforward project. It was us in Lahore, a partner organization in New Delhi. [There would be a] conference in Delhi and a conference in Lahore. That’s about it. We got the funding and started work. After giving the presentation at the conference, two research associates were approached by an officer who invited them for tea at the Pakistan High Commission. They kept them in the High Commission for four hours. After they were let go and they returned to the hotel room, they had found it to be raided. So the way the security establishment looks at this on both sides of the border is kind of insane.”⁷⁴

According to Mr. Alam, this is what some academics call a “hegemony over the discourse:” when the conversation is limited to one facet of a subject. In this case, the facet is the security aspect.

⁷¹ Ibid.

⁷² Naqvi, Feisal. Personal Interview. Aug 10, 2018.

⁷³ Alam, Rafay. Persona Interview. Aug 10, 2018.

⁷⁴ Ibid.

He explained how entrenched Pakistan's security establishment was in deciding Indo-Pak water policy:

“I had the chance to meet the Indus Waters Commissioner as part of my project. He was trying to set up a meeting regarding the Kishenganga matter. In the process, he is speaking to the secretary of water and power, someone from the foreign office, the Military Secretary, someone in the military intelligence. And then there is a phone next to his foot that doesn't even ring, he just picks it up and goes ‘jee...jee’ [yes...yes] and puts it down.”⁷⁵

With so many actors from various facets of the security establishment in the loop, the Indus River has become securitized amongst the political elite, as well as the Pakistani public. For example, after Pakistan lost the Baglihar decision, the Indus Commissioner at the time, Syed Jamaat Ali Shah, was accused of “betraying” the country by “giving” India the ability to control water supply by a Senate Panel.⁷⁶ This statement is not only blatantly false but is representative of how Pakistan seeks to blame India for its water woes rather than focusing on structural issues of mismanagement and inequitable distribution. This kind of rhetoric, from the Senate no less, indicates how little Pakistani policymakers truly know about the water crisis. Rafay Alam had this to say on the matter:

“Whenever I hear the Jamaat Ali Shah betrayed the nation, I laugh and recount the experience I told you about [mentioned above]. So it occurred to me that firstly, everything that the guy does is obviously monitored. All the phone calls, the communication, is monitored by someone else. To then say that he sold the river is a huge cover-up. The folks that I could see were keeping an eye on him either didn't know what they were doing, or it wasn't an issue.”

Alleged complicity by the security establishment not only undermined the autonomy of the Commission but put Mr. Shah's life at risk. Seeing the inflamed passions of the public, coupled with being accused of treason and betrayal, Mr. Shah fled to Canada.⁷⁷ The authorities have asked for his repatriation, but the request has been denied. The character assassination of Jamaat Ali Shah is an example of how Pakistan politicized water as part of general Indian paranoia. This creates long term problems as political issues quickly descend in broader issues of identity, ideology, and nationalism — all of which have nothing to do with the actual crisis at all.

The politicization of water in Pakistan intensifies when India initiates it. In retaliation to Pakistan's alleged support for the Uri Attacks in Indian-administered Kashmir in 2016, Prime Minister

⁷⁵ Ibid.

⁷⁶ “Betrayal charge: Senate Panel Seeks Arrest of Ex-Water Commissioner.” The Express Tribune. Oct 2, 2014. <https://tribune.com.pk/story/770111/betrayal-charge-senate-panel-seeks-arrest-of-ex-water-commissioner/>

⁷⁷ Ibid

Narendra Modi gave his infamous “blood and water speech.” It was the first time since 1948 that India had threatened Pakistan through water. The speech marked a new period in Indo-Pak water relations: the weaponization of water by India. This would have severe ramifications on the discourse and understanding of water by the general public.

Yet, all politics are local. A closer inspection of the timeline of the speech reveals larger truths regarding the causes of this newfound politicization.

- July 2016:** Secretary-level talks between India and Pakistan collapse over the designs of the Kishenganga and Ratle projects.⁷⁸
- August 2016:** Pakistan requests the World Bank to establish an International Court of Arbitration for Kishenganga and Ratle.⁷⁹
- September 2016:** India accuses Pakistan over the Uri Attacks in Indian-administered Kashmir. Modi delivers infamous “blood and water speech.” Suspends annual Commissioners meeting.⁸⁰
- November 2016:** India criticizes the World Bank for “favoring Pakistan.”⁸¹
- December 2016:** World Bank “freezes” all matters related to Kishenganga.⁸²
- February 2017:** President of World Bank comes to Pakistan. Expresses concern about water.⁸³
- March 2017:** NIA releases two Pakistani teens alleged for Uri attack.⁸⁴
- March 2017:** Indus Commissioners resume meeting.⁸⁵

Rafay Alam highlighted the importance of the context in which the “blood and water speech” was delivered:

⁷⁸ Mustafa, Khalid. “Pak-India Talks on Kishenganga and Ratle Hydropower Projects Fail.” *The News*. July 21, 2016. <https://www.thenews.com.pk/print/136475-Pak-India-talks-on-Kishenganga-and-Ratle-hydropower-projects-fail>

⁷⁹ Alam, Rafay. Personal Interview. Aug 10, 2018.

⁸⁰ Gupta, Joydeep. “India Suspends Indus Commissioners’ Meetings.” *India Climate Dialogue*. Sep 26, 2016. <https://indiaclimatedialogue.net/2016/09/26/india-suspends-indus-commissioners-meetings/>

⁸¹ Alam, Rafay. Personal Interview. Aug 10, 2018.

⁸² “World Bank Declares Pause to Protect Indus Waters Treaty.” *World Bank*. Dec 12, 2016.

<http://www.worldbank.org/en/news/press-release/2016/12/12/world-bank-declares-pause-protect-indus-water-treaty>

⁸³ “World Bank Group President Jim Yong Kim Visits Pakistan.” *World Bank*. Feb 8, 2016.

<http://www.worldbank.org/en/news/press-release/2016/02/08/world-bank-group-president-jim-yong-kim-visits-pakistan>

⁸⁴ “NIA Releases 2 Pakistani Teens arrested for Uri Attack.” *Hindustan Times*. Mar 9, 2017.

<https://www.hindustantimes.com/india-news/nia-releases-2-pakistani-teens-arrested-for-uri-attack/story-T7DdbwAHeGHsTiMhHKazTK.html>

⁸⁵ Shahzad, Mirza Khurran. “Analysis: Indus Commissioners Talks: First Step to Composite Dialogue?” *Dawn*. Mar 20, 2017. <https://www.hindustantimes.com/india-news/nia-releases-2-pakistani-teens-arrested-for-uri-attack/story-T7DdbwAHeGHsTiMhHKazTK.html>

“Consider the timeline. In November 2016, Modi gives a speech in Bhatinda, Punjab, where he says that he won’t let a drop of water from the Ravi into Pakistan. There is a BJP-Congress by-election on the horizon a month and a half away. So, he is ratcheting up the anti-Pakistan rhetoric for domestic political gain. I think he used Uri to leverage the bank into supporting India’s Neutral Expert request [for Kishenganga].”⁸⁶

Modi set up a committee to review options for India to leverage Pakistan within the framework of the Treaty as well as examine the possibility of India unilaterally withdrawing from it.⁸⁷ Sartaj Aziz responded by saying any attempted abrogation will be considered an “act of war.”⁸⁸ With each statement by India and with each rebuttal by Pakistan, an atmosphere of anxiety was created around the possibility of India “closing the tap” on Pakistan. This rhetoric did not help ease Pakistan’s water concerns.

Pakistan has also accused India of not sharing data on the rivers. Article VI of the Indus Waters Treaty states that daily data recordings of rivers, reservoirs, canals, and link canals have to be shared by both parties on a monthly basis. Mr. Naqvi confirmed that this was true in his experiences with his Indian counterparts:

“A lot of parameters of dams are built on flow data. But when it came to Kishenganga, we barely had any data. The two sets of data we received [from the Indians] were not matched or coordinated. Even in Baglihar I distinctively remember going up to the Secretary and telling him ‘for God’s sake give us data, there is no point arguing without data.’”⁸⁹

India not sharing data with Pakistan only adds to mistrust on both sides. According to Daanish Mustafa, the cause for Indian apprehension to share data with Pakistan is not rooted in India’s mistrust of Pakistan, rather, intra-provincial tension in India:

“There is tension over water between Punjab, Haryana, Rajasthan, and Kashmir. They don’t publish their water statistics, so data is classified. By attempting to hide statistics from each other, they, in turn, hide it from Pakistan. In the 1980s, around 45,000 people died in Indian Punjab. One of the biggest causes of conflict was water

⁸⁶ Alam, Rafay. Personal Interview. Aug 10, 2018.

⁸⁷ Gupta, Joydeep. “India Suspends Indus Commissioners’ Meetings.” India Climate Dialogue. Sep 26, 2016. <https://indiaclimatedialogue.net/2016/09/26/india-suspends-indus-commissioners-meetings/>

⁸⁸ Aziz, Sataj. “Revocation of Indus Waters Treaty can be taken as an act of war.” Dawn. <https://www.dawn.com/news/1286437/revocation-of-indus-waters-treaty-can-be-taken-as-an-act-of-war-sartaj-aziz>

⁸⁹ Naqvi, Feisal. Personal Interview. Aug 10, 2018.

distribution between Punjab and Haryana. India cannot afford to see an uprising of the sort again and hide statistics from Punjab.”⁹⁰

The Indus Commissioners meetings are in private, and therefore, the minutes and meetings are not publicized. The question thus arises: why can't data be shared amongst Commissioners if they are not shared between provinces? Daanish Mustafa provided an explanation:

“The Commissioners obviously don't deal with intra-provincial matters. India gives us a final number of the amount of water they release. We check this number and confirm its validity. But they don't share any river gauge data behind the point of release. They don't share this because the Punjab and Haryana will get their calculators and start calculating their share, or lack thereof. This is their political constraint having witnessed a decade long civil war in Punjab.”⁹¹

Both countries must take confidence-building steps in the realm of water to repair the trust deficit. The nature of the Indus Commission allows this to happen more easily (as compared to broader Indo-Pak relations) as the dealings are behind closed doors. India must take steps to put aside internal political differences to ensure the smooth coordination on the international transboundary level. This is especially relevant now given the recent politicization of water.

In 2018, Narendra Modi inaugurated the Kishenganga power plant amid calls from Pakistan that the dam violated the Indus Waters Treaty.⁹² The inauguration was widely reported in local media and quickly made the rounds on social media. Pakistan then sent a delegation led by the Attorney General to the World Bank headquarters in Washington D.C.⁹³ They were unable to achieve a favorable result and came back empty-handed.

Daanish Mustafa argues that the politicization of Kishenganga is one of the primary stimulants that helped allow the water crisis to “catch the country's attention.” In a recent op-ed, he argued that the Kishenganga “is a run of the river project with almost negligible effect on water flow to Pakistan, especially in light of the Court of Arbitration's ruling in favor of Pakistan in 2010. So why do we believe that we are doomed?”⁹⁴

The reality is that the Kishenganga project has done more damage to the public conversation than it has good. The inauguration, and the discourse amongst the public and the media played into existing Pakistani dispositions about India acquiring the ability to threaten Pakistan through water.

⁹⁰ Mustafa, Daanish. Personal Interview. Aug 4, 2018.

⁹¹ Ibid.

⁹² “Modi Inaugurates Kishenganga dam.” The News. May 20, 2018.

<https://www.thenews.com.pk/print/318990-modi-inaugurates-kishanganga-dam>

⁹³ “Pakistan Goes to World Bank Today To Protect Water Rights.” Dawn. May 21, 2018.

<https://www.dawn.com/news/1409002>

⁹⁴ Mustafa, Daanish. “How Doomed Are We?” Daily Times. Aug 9, 2018.

<https://dailytimes.com.pk/280434/exactly-how-doomed-are-we/>

This is simply not true. But in politics, some myths are as good as reality. And the myth that India causes Pakistan's water crisis is as good as any.

The Treaty Going Forward

Before, delving into the question of the future of the Treaty, one must be cognizant of why it has been so successful. Feisal Naqvi believes the success of the Treaty lay in its division:

“...And the reason there is such a clear demarcation, what is ours is ours and what is theirs is theirs (in terms of Pakistan's control of the Western Rivers and India's control of the Eastern rivers), is because you don't have the ability to work together. I think that was a sensible recognition, and that is what has made the Treaty workable.”⁹⁵

We believe his argument has merit. While it may not have been an explicit reason for the division of the rivers, it is clear that the two countries cannot hold a regular dialogue at a political level given the repeated breakup of talks. The two countries have failed to work together effectively. In this context, perhaps it was best that the Treaty did not share water control on particular rivers but gave each country three rivers to meet their requirements. According to Rafay Alam, it is the only water Treaty in the world that divides a river.⁹⁶ However, given the political climate of India and Pakistan, we believe this is beneficial.

The IWT has been successful in bringing both parties to the table through the regular meetings of the Indus Commissioners. This represents a larger achievement for Indo-Pak relations: a continuation of non-politicized, private, established communication and dispute-resolution mechanism. Article VIII (5) says that the both the Pakistani and Indian Permanent Indus Commissions are to meet at least once a year. The Commissioners are “the sole representative of their government for all matters arising out of this Treaty” and are serve as a “regular channel of communication on all matters relating to the implementation of the Treaty.”⁹⁷ Mr. Naqvi argues that this channel of communication can only prove to be beneficial to the wider Indo-Pak relationship:

“Whenever someone mentions that the Treaty is terrible, especially from the Pakistan side, I get baffled...look, it's a good thing! The Treaty makes two paranoid countries deal rationally with each other. Leave it alone and stop messing with it.”⁹⁸

⁹⁵ Naqvi, Feisal. Personal Interview. Aug 10, 2018.

⁹⁶ Alam, Rafay. Personal Interview. Aug 10, 2018.

⁹⁷ 1960 Indus Waters Treaty, Available at:

<https://siteresources.worldbank.org/INTSOUTHASIA/.../IndusWatersTreaty1960.pdf>

⁹⁸ Naqvi, Feisal. Personal Interview. Aug 9, 2018.

And herein lies one of the Treaty's greatest success: an established mechanism for dialogue and communication between two countries that do not engage in regular dialogue.

However, contemporary issues have emerged given the fact that the Treaty is now 58 years old. Not a word of it has been modified, altered, or changed in any way. Science and technology have changed the way water experts understand and approach hydrology in the present day and have shed light on issues that were not known in 1960. Many people in Sindh, the southernmost and second-largest province in Pakistan, feel that the Treaty didn't address their concerns as the lower riparian of Punjab.⁹⁹ The IWT was negotiated between India and Pakistan in a manner that evaded the issue of Kashmir's disputed status despite giving the countries a license for agricultural and hydropower developments. Moreover, China and Afghanistan, the two other states that encompass the Indus Basin were not included in the Treaty.¹⁰⁰

Hydrology has evolved since 1960. The understanding of issues in 1960, such as siltation, was limited compared to what we know today. This has had practical ramifications on the Indo-Pak water relation in the present. In the Baglihar dispute, siltation and sediment control was the primary reason why India opted to install low-level outlets.¹⁰¹ This was the main point of contention for Pakistan. Daanish Mustafa explained how the supposed lack of knowledge affected the case:

“Whenever you divert water to create a ‘head.’ That is, diverting water where it normally did not flow, it seeps into the groundwater. So, if you look at a hydrograph, you will realize the 4-5% of the water level, depending on the density of the water, has reduced. It is a very simple physical process. But the rum is that there are probably only one or two people in Pakistan who know this. Now, this process was not known in 1960.”¹⁰²

However, many stakeholders in the region that feel that the Indus Waters Treaty robbed them of a “seat at the table.” These stakeholders include Sindh, Kashmir, Afghanistan, and to a lesser extent, China.

During the negotiations of the Treaty in the 1950s, the government of Pakistan adopted the “One Unit” scheme. This was a scheme that amalgamated and merged the four provinces of West Pakistan (present day Pakistan) into a single entity to act as a counterweight to East Pakistan (present day Bangladesh). By ‘unifying’ western Pakistan, the state removed the Sindhi perspective from the entirety of the negotiations. Ayesha Jalal, a professor at Tufts University, described the One Unit scheme in the context of water in the following way:

⁹⁹ Jalal, Ayesha. Personal Interview. Aug 9, 2018.

¹⁰⁰ Zafar, Adeel et. al. “Imagining Indus: Overcoming water insecurity in the Indus Basin.” Springer International Publishing. Pp 5.

¹⁰¹ Naqvi, Feisal. Personal Interview. Aug 10, 2018.

¹⁰² Mustafa, Daanish. Personal Interview. Aug 4, 2018.

“The One Unit Scheme enhanced suspicion and mistrust within Pakistan. It was imposed on smaller provinces and has generated hatred and anger. That is why Kalabagh is such a monster for you [Pakistan].”¹⁰³

Sindhis have consistently felt that the brunt of Pakistan’s water crisis has fallen on them as they are the lowest riparian in the Indus Basin.¹⁰⁴ Moreover, with most of Sindh’s arable land falling prey to the menace of waterlogging and salinity, anger over poor water mismanagement has been streamlined to Punjab, Pakistan largest and most fertile province.¹⁰⁵ Punjab is the upper riparian whereas Sindh is the lowest riparian in the basin. Sindhis have mistrusted Punjab and its use over water and argue that Sindh does not receive its fair share. They point to the One Unit scheme and argue that depriving the “Sindhi perspective” during negotiations culminated in a Punjabi-centric Treaty. They argue that the IWT has to be revised to ensure the water rights of Sindh are protected.

Similarly, the Indus Waters Treaty completely avoided discussing the disputed region of Kashmir in the negotiations or the final draft. However, the bulk of the Treaty directly affects the physical land mass of Kashmir and thereby, the Kashmiri people. This lack of representation prompted the Jammu and Kashmir Assembly to table a resolution in 2003 rejecting the Indus Waters Treaty and hire a consultant to quantify their losses.¹⁰⁶

The Indus Basin also comprises Afghanistan and China, two states that are not included in the Treaty. Zafar Adeel has argued that the need to incorporate the two countries into a renegotiated Treaty is of critical importance. Given that Afghanistan’s developmental agenda will put more pressure on the basin’s waters, and the exacerbation of China’s freshwater crisis which may lead them to exploit Tibetan glaciers, all four countries might need to renegotiate this treaty and discuss shared water management in the future.¹⁰⁷

Given these tensions and criticisms, calls for possibly abrogating the IWT have surfaced in recent years. From the Pakistani perspective: “The IWT worked well till the 1980s until India started building dams...on the Western Rivers...building tens of dams without the consultation of the lower riparian leaves the Treaty virtually defunct.”¹⁰⁸ In turn, from the Indian perspective: “India

¹⁰³ Jalal, Ayesha. Personal Interview. Aug 9, 2018.

¹⁰⁴ The Hisaar Foundation. “Thirsty for Water, Sindh Braces for a Public Health Crisis.” Geo TV. <https://www.geo.tv/latest/197379-thirsty-for-water-sindh-braces-for-a-public-health-crisis>

¹⁰⁵ Rajput, Muhammad Idris. “Water Problem: Perspective from Sindh.” Problems and Politics of Water Sharing in Pakistan. Pp 117-127.

¹⁰⁶ Khaki, Saadat Bilal. “Indo-Pak and Hydro-Politics.” GreaterKashmir. Jul 26, 2018. <https://www.greaterkashmir.com/news/op-ed/indo-pak-and-hydro-politics/291555.html>

¹⁰⁷ Zafar, Adeel et. al. “Imagining Indus: Overcoming water insecurity in the Indus Basin.” Springer International Publishing. Pp 5.

¹⁰⁸ Vashishth, C.R. Indus Waters Treaty: Conflict Between India and Pakistan.

must harness the water sources...given the support to terrorists by Pakistan...it is time India use the water leverage to force Pakistan to review its security compulsions.”¹⁰⁹

There is no doubt that the Treaty does not encompass various stakeholders in the Basin. There is also conclusive evidence that issues such as climate change and the advancements in science and technology make this Treaty outdated. Nevertheless, we do not believe that the Treaty should be opened up for any form of renegotiation from the Pakistani side. The Treaty was meant to ensure Pakistan’s water security by creating a legal framework through which India could not control Pakistan’s waters. As we have argued throughout our paper, there seems to be no indication that the Treaty is failing to achieve this. Furthermore, Pakistan opening up the Treaty implies that they believe they can derive further benefits from India. This is simply not true. India has no reason to give up any of their share of water and make concessions to Pakistan given the growing needs of the population and the developmental plan India has embarked on.

Moreover, we do not believe that India will unilaterally leave the Treaty. A glance at geopolitical dynamics supports this. India is a rising power and sees itself as such. It is also a responsible actor and has upheld international agreements and treaties in the past. Furthermore, with its push to become a permanent member of the Security Council, India needs to demonstrate restraint and uphold its neo-liberal tendencies. This view was echoed by Zafar Adeel, author of *Imagining Indus* and leading academics on water in Pakistan:

“Strategically, India does not gain. India cannot systematically go about depriving Pakistan of their water. It does not gain them anything. Any attitude to do otherwise would hurt its aspirations of making them a regional and global power. Additionally, India wants to sit on a permanent Security Council in the United Nations, which Pakistan is strongly opposed to. Any de-escalation and furthering talks with Pakistan, could even help India get its much-desired seat in the Security Council.” [Zafar Adeel]¹¹⁰

Abandoning the Treaty will hurt India’s reputation internationally for taking advantage of its position to threaten Pakistan. Moreover, India has to be cognizant of the fact that it is a lower riparian of the Brahmaputra river with China being the upper riparian. India or China do not have any water-sharing agreement or treaty regarding the Brahmaputra river.¹¹¹ Any threats on India’s side will give China the opportunity to start its own projects on the Brahmaputra. This will negatively affect water inflow into India, who would want to avoid these projects at all costs given China’s close relationship with Pakistan.

¹⁰⁹ Chaturvedi, AK. “Indus Waters Treaty: Options for India.”

¹¹⁰ Zafar, Adeel. Personal Interview. 8 August 2018.

¹¹¹ “Brahmaputra River: An Eternal Conflict Between India and China.” Tibet Policy. Nov 2, 2017. <https://tibetpolicy.net/comments-briefs/brahmaputra-river-an-eternal-conflict-between-india-and-china/>

Recommendations

We make the following recommendations for utilizing the Treaty to enhance greater cooperation in the Indus Basin:

1. **Execute the Kishenganga Decision by complying to India’s request to take the matter to a Neutral Expert rather than the International Court of Arbitration.** The Kishenganga Decision in 2013 represented an unequivocal victory for Pakistan. However, the impasse over which forum to use in implementing the settlement led Pakistan to squander their victory. The status-quo position of using the ICA over the Neutral Expert has led to more harm than good. We do not believe that it is in Pakistan’s best interest to take the matter to the ICA, who would be better off accepting India’s request to take remaining questions to the Neutral Expert.
2. **Ensure a working definition of “Pondage” that is acceptable to both parties.** There are two competing and conflicting definitions of pondage under the Treaty.¹¹³ The two countries should take the issue to either the ICA or Neutral Expert and request clarification on the matter. We hope this will preempt and prevent future disputes.
3. **Timely data sharing through installment of telemetry systems.** As a downstream country, Pakistan cannot be denied access to gauge levels and data regarding river flow. Without this information, Pakistan cannot ascertain whether India is adhering to the IWT. There is a genuine concern that India is not sharing this data as stipulated by the Treaty, nor in good faith to reconcile differences and regain trust. One step that can be taken is to install a satellite-based, telemetry system for real-time hydrology data on rivers. This issue has been discussed in the past between Commissions, and steps should be taken regarding implementation.
4. **Transparency between Commissioners regarding new Indian Projects on Western Rivers.** Pakistan’s concerns are multiplied due to lack of timely and adequate data sharing which has deepened distrust between the two countries. Islamabad strongly believes New Delhi has not been fulfilling its obligations stipulated in the IWT such as communicating details of new projects six months before their commencement, diversion for storage and farm purposes from Western Rivers, and providing details about ancillary projects.¹¹⁴ India needs to supply timely information on the design of its projects on Western Rivers before starting work on them. This will allay Pakistan's apprehensions regarding their incompatibility with the Treaty and transboundary impacts on the Pakistani side.
5. **Mitigate the role of the World Bank and other international institutions in Indo-Pak transboundary water relations.** The World Bank’s helped negotiate the Treaty and disperse the necessary funds for the Indus Basin Project. The Bank has no contemporary

¹¹³ Naqvi, Feisal. Personal Interview. Aug 10, 2018.

¹¹⁴ Akhtar, Shaheen. “Emerging Challenges to the Indus Waters Treaty.” <http://www.irs.org.pk/f310.pdf>. Pp 215.

role except to help appoint a Neutral Expert and ICA panel in case when both parties cannot resolve outstanding issues bilaterally. Going to the World Bank, as Pakistan has repeatedly done in recent years, is unnecessary and detracts from more substantial, structural issues.

6. **De-politicize and de-securitize the Treaty and broader Indo-Pak water relations.** The current problems with dam design are engineering problems with engineering solutions. These issues should not be conflated with needless political rhetoric or “point-scoring,” which is usually not grounded in fact. By securitizing and politicizing the Treaty, the discourse is shaped away from the true reasons for the crisis, which we will discuss in Part II.

Conclusion

We have conducted our analysis of the Indus Waters Treaty to understand India’s role in Pakistan’s water crisis. Our research concludes that India does not *directly* cause the crisis in any way. The limited effect of the run-of-the-river projects, such as Baglihar and Kishenganga, only negligibly affect water supply into Pakistan. The indirect effect is much greater: Tensions with India serve to distract from the bigger issue of inequitable distribution and misallocation which we will elaborate in Part II.

Pakistan has genuine grievances regarding Indian projects on the Western Rivers. However, the IWT has an established dispute-resolution mechanism that has been respected by both parties and continues to service their needs today. For these reasons, we do not believe the Treaty should be revisited, revised, or discontinued. Using Article VII to open the Treaty up for “improvements” might be problematic given the political climate between the two countries and a recognition that Pakistan will face immense challenges in deriving concession from India.

Pakistani President Ayub Khan truly concludes it best, “We have been able to get the best that was possible...very often the best is the enemy of the good and in this case, we have accepted the good after careful and realistic approach of our entire overall situation...the basis of this agreement is realism and pragmatism.”¹¹⁵

¹¹⁵ Tariq, Sardar Muhammad. “The Indus Waters Treaty and Emerging Water Management.” Pp 87-88.

Part II: Domestic Water Mismanagement, Allocation, and Prioritization

“There is a crisis. It’s worse than you think. But it is not what you think.” - Dr. Daanish Mustafa, Professor at King’s College London

Post-Colonial Legacies of Water Control in Contemporary Pakistan

An accurate understanding of history explains the present. Therefore, one cannot explain modern day deficiencies in Pakistan’s domestic water policy without understanding the effect of the British Empire on the Indus Basin. The present irrigation system in Pakistan owes its birth to the vast public works drive undertaken by the British colonial administration in the late 19th century¹²⁰. All previous irrigation systems in the subcontinent pale in comparison to the enormous expansion of the canal system undertaken by the British. Famine prevention was ostensibly the initial impetus for the colonial administration to undertake the expensive project of irrigation development. But many scholars including Gilmartin and Mustafa have ascribed the following additional motivations behind the almost missionary development of the colonial irrigation system in the Indus basin¹²¹:

- Anticipation of the increase in tax returns of the new irrigation system;
- Increased government control of the population through agricultural employment thereby minimizing the threat of a revolt;
- Reinforcement of the superiority of British “imperial scientific” discourse in the eyes of the “natives” through control of geography and the environment;
- Cultivation of local elites through a network of support including settlement and resettlement policies. These elites owed their prosperity to the irrigation system and therefore to the British.

The ethos governing water management was not driven by a micro-level concern for public well-being and equity, or for the provision of public service to the people, but rather, by the need for consolidation and rationalization of colonial control by creating specific geographies of access to resources and social control.¹²³ Today, Pakistan’s water management policies are merely a continuation of the British colonial legacy.¹²⁴ The post-colonial Pakistani state inherited a colonial administrative system whose ethos was not changed at the time of independence. The countervailing rural civil society, for which the Canal Act was supposedly made, was weak at the

¹²⁰ Whitcombe, 1982

¹²¹ Gilmartin, David. “Scientific Empire and Imperial Science: Colonialism and Irrigation in the Indus Basin.” *Journal of Asian Studies* 53 (4): pp 1127-1149

¹²³ Mustafa, Danish. Personal Interview. 4 August 2018.

¹²⁴ Jalal, Ayesha. Personal Interview. 9 August 2018.

time of independence and has remained disenfranchised due to the Pakistani state's inability to change the modus operandi of using water for control and power.

The water bureaucracy is still characterized by a definable hierarchy of functionaries, who are typically more in tune with the requirements of their internal administrative hierarchy than public demands for equity and public efficiency in management.¹²⁵ Irrigation departments seem to be conveying an impression of being more of a policing body against a rogue population than a public utility working for their benefit.

Water continues to be used as a form of control by those who have access to it: the state, feudal lords, and landowners.¹²⁶ Fawad Khan explained the continuation of power relations in regard to inequitable distribution:

“If you live in a nice posh area you get good municipal services, water is pumped. If you live in a slum, there is not even a tap. A majority of agricultural usage of water is tied to the amount of land you have. If you are a big landlord, you have a lot of water, sometimes even millions of gallons of water per day. Whereas, there are thousands of landless people who have no water and no claim to anything.”¹²⁷

There is no noteworthy contrast when it comes to differentiating the mentality of those in power today from those who were the colonial rulers of the past. In the coming sections, we will show how this mentality is the fundamental problem in addressing contemporary water concerns. Until water is seen as a means of influence, power, and control, and not a public utility that is equitably distributed to all citizens (as enshrined in Pakistan's constitution), no policy, reform, or dam—no matter how visionary or grand—will substantially alter the course of the crisis. In the coming sections, we will show how structural deficiencies have been molded by Pakistan's colonial legacy but have presented themselves contemporarily through grossly decadent state priorities vis-a-vis water allocation and distribution.

The Reality of Pakistan's Water “Scarcity”

The first page of Pakistan's National Water Policy 2018 introduces Pakistan's water crisis as follows: “With a rapidly growing population, Pakistan is heading towards a situation of water shortage and by corollary, a threat of food insecurity. Per capita surface water availability has declined from 5,260 cubic meters per year in 1951 to around 1,000 cubic meters in 2016. This quantity is likely to further drop to about 860 cubic meters by 2025 marking the transition from a

¹²⁵ Mustafa, Daanish. “Colonial law, contemporary water issue in Pakistan.” *Political Geography* Vol. 20, 2001. pp 817-837

¹²⁶ Jalal, Ayesha. Personal Interview. 9 August 2018.

¹²⁷ Khan, Fawad. Personal Interview. Aug 7, 2018.

“water stressed” to a “water scarce” country (the minimum water requirement to avoid food and health implications of water scarcity is 1,000 cubic meters per capita per year).”¹²⁸

This statement has sparked national conversation, albeit in a problematic fashion. A preliminary reading of the aforementioned statistic introduces the problem to be a “lack of water per capita.” This is highly reductive and simplistic as it does not highlight the true components of the crisis. A simple reading of the statistics implies that the physical availability of water has decreased. In reality, the statistic is related to a wholly different issue altogether: population growth:

“This one statistic has been the biggest catastrophe about the way to think about water! It does not take a mathematical genius to tell you that if your population increases roughly five-fold, your per-capita water availability will decrease five-fold. Yet, people don’t think of this statistic that way. When they read it, they start thinking about the absolute scarcity of water — that there is five-time less water in the country. This is a misnomer. Pakistan has the same amount of water as it did 3 billion years ago and will have the same amount of water 3 billion years from now. Ask any fourth-grade geography student who knows about the water cycle and he will tell you why.”¹²⁹

The fact that the physical quantity of water has not changed leads to the question: is there enough water in the Indus Basin to sustain the lives of 210 million people?

The UN declared a human right to water on 28 July 2010, with the issuance of Resolution 64/292. This resolution provided that between 50 and 100 gallons are needed per person per day to provide basic needs, such as water for drinking and bathing. If we use the upper limit of 100 gallons being the daily requirement—and with 200 million people living in Pakistan—this will amount to a demand of roughly 33.6 Million Acre Feet (MAF) per year.¹³⁰ Given that the total annual freshwater in the Indus Basin roughly amounts to 263-268 MAF, daily requirements are much less than the total estimated annual flow of Indus surface water.¹³¹ This suggests that there is more than enough water to adequately sustain the country’s population.

Experts were mostly in complete agreement regarding this hypothesis and cited agriculture as the primary cause of the water crisis:

“The notion that there is a shortage of water in Pakistan is wrong, there is no scarcity. In fact, there is too much water. Agriculture consumes the most water. In

¹²⁸ National Water Policy 2018. Available at: <http://mowr.gov.pk/index.php/national-water-policy-2018/>

¹²⁹ Mustafa, Danish. Personal Interview. 4 August 2018.

¹³⁰ Zafar, Adeel et. al. “Imagining Indus: Overcoming water insecurity in the Indus Basin.” Springer International Publishing. Pp 23-25

¹³¹ Zafar, Adeel et. al. “Imagining Indus: Overcoming water insecurity in the Indus Basin.” Springer International Publishing. Pp 24-26

Pakistan, we have surplus food. That means we have surplus water. The problem is we are using water in a disastrous way. Since there is no pricing mechanism, no one has an incentive to use water efficiently. That is why you see practices like flood irrigation waste so much water. We have an issue of water management, not scarcity.”¹³²

Other experts supported this claim and added that the issue of scarcity is simply constructed based on state policies:

“If you throw 1000 cubic liters of water over someone’s head, and they don’t know how to swim, they will drown. According to the UN, a human being needs a minimum of 40 liters of water to live. Multiply that by 200 million, and you will see there is no scarcity. If you want to make a swimming pool for every cow, there could be a scarcity. If you want to cultivate sugarcane, there you will probably have scarcity. And if you want to do corporate farming, then you’re screwed because you will have scarcity. But if you want to have *roti* (bread), then there is no issue, no scarcity.”¹³³

It is clear that Pakistan does not have a physical scarcity of water, but that the water Pakistan possesses is not equitably distributed as millions of people do not have regular access to it. Pakistan allocates 95% of its water to agriculture, making it the largest fraction of water consumption in Pakistan.¹³⁴ Therefore, it is essential to understand the role of agriculture in Pakistan’s broader water context in the next section.

The Agriculture Dilemma

“If you want to make a swimming pool for every cow, there is a little scarcity. If you want to cultivate sugarcane, there is bigger problem. And if you want corporate farming, you’re screwed. But if you want roti (bread), there is no scarcity.” – Daanish Mustafa¹³⁵

Pakistan’s reliance on agriculture is the single largest cause of the water crisis today. The state allocates 95% of its water to produce 20-25% of its annual GDP output.¹³⁶ We posed a simple question to a high-ranking bureaucrat we interviewed: how can one morally justify such a mismatch in the allocation of resources? According to him, the answer can be found in the need for food security: humans need food, food needs water.¹³⁷ However, a closer look at where the water goes reveals a different picture.

¹³² Ahmad, Masood. Personal Interview. Aug 6, 2018.

¹³³ Mustafa, Danish. Personal Interview. Aug 4, 2018.

¹³⁴ National Water Policy 2018. Available at: <http://mowr.gov.pk/index.php/national-water-policy-2018/>

¹³⁵ Mustafa, Daanish. Personal Interview. Aug 4, 2018.

¹³⁶ Ibid.

¹³⁷ Anonymous Bureaucrat. Personal Interview. Aug 5, 2018.

Cotton and sugarcane are two of the most water-intensive crops to produce. The amount of water these crops use is staggering; roughly 22,500 liters of water are required to produce one kilogram of cotton and 1,500-3,000 liters for one kilogram of sugarcane.¹³⁸

However, Pakistan has not only allowed, but encouraged, the growth of these water-thirsty crops. Sugar cane is arguably the most controversial. Sugar is a delicacy and does not contribute to the food security of the country. Yet, the government has taken no steps to limit its growth and save water.

Mansoor Awan, a lawyer based in Lahore, talked to us about the effects of growing sugarcane on water levels in an area. Mr. Awan's associate, Asghar Leghari, is from Rahim Yar Khan, a border town between Sindh and Punjab that lies on the banks of the Indus River. There is no canal system there, so there is greater reliance on groundwater. In the last two decades, eight new sugar mills opened in the district. The water level dropped from 20 feet to 80 feet and is on its way to reaching 100 feet.¹³⁹

“I am a proponent of doing away with sugar cane and the sugar industry entirely. We can always import sugar from Brazil. But we cannot allow our water to be wasted. Sugar is a delicacy, but water is life. But the interests are too entrenched.”

The “interests” that Mr. Awan was alluding to were that of the sugarcane lobby. Pakistan's sugar millers are mostly influential politicians. Sugar is the fuel that national politics runs on. The sugar lobby primarily funds the three largest political parties. But this is not an issue of crony capitalism, which symbolizes the relationship between the business and political class. Here, the business class is the political class.

In 2009, *The Nation* reported that there were 78 sugar mills in the country and the leaders of the three biggest parties alone—mostly through relatives and associates—owned more than fifty percent of these mills.¹⁴⁰ While an argument could be made that this data is outdated, a simple review of the politicians named in the report makes it clear this is not the case. Nawaz Sharif (ex-Prime Minister), Asif Ali Zardari (ex-President), and Jehangir Tareen (the biggest financial contributor to the current ruling party's government) all continue to play an active role in the politics of Pakistan today. The fact that powerful political players all have high financial stakes in the sugarcane industry makes the issue more complex. The policymakers who are trusted to act as

¹³⁸ “5 Most Water Intensive Crops.” Claroenergy. N.D. <http://claroenergy.in/5-most-water-intensive-crops/>

¹³⁹ Awan, Mansoor. Personal Interview. Aug 10, 2018.

¹⁴⁰ Cheema, Usman. “Politicians, Families own 50pc of country's sugar factories.” *The Nation*. August 23, 2009. <https://nation.com.pk/23-Aug-2009/politicians-relatives-own-50pc-of-countrys-sugar-factories>

representatives of the people happen to be the ones gaining from the existing policies that cause of the crisis itself.

This is most directly seen in the continued support and patronage of sugarcane cultivation through subsidies. Billions of rupees are paid from the Public Exchequer in the form of subsidies to boost sugarcane production, primarily for exports. For example, in the 2017-18 season, the Sindh government alone paid a provincial subsidy of Rs 3.25bn (Rs9.3/1kg) to sugar mills located in Sindh as export rebate. Of the 1.7m tons Pakistan exported, 0.9m were from Sindh.¹⁴¹

Daanish Mustafa believes that one of the best ways to save water is to stop subsidizing sugarcane production:

“The easiest way...is stopping subsidies. The irony lies that the government lays the seed of its own destruction by making sugarcane commercially viable because of its subsidy. Subsidizes the crop on the water stage, electricity stage, support price stage and even the marketing stage. These subsidies are not the small farmer but for the politically connected sugar mill owner.”¹⁴²

However, former members of the government we interview were not so open to the change:

“We [Pakistan] are...an informal association of farmers...bringing water-efficient practices. A population that has for a thousand years used to growing rice, [it is] very difficult for them to convince them to grow anything else. The government can motivate and demonstrate but cannot make a law. Sugarcane is poor man’s only source of energy as they can’t afford proteins. We are a large sugar consumer country.”

When we asked whether or not sugarcane subsidies negatively affect water resources in Pakistan, the bureaucrat went on the defensive:

“We are going in subjects...*not connected to water problems*. These large land growers are only in name. Absentee landlords lease out to small farmers. Very few hired as labor and most cases were where land is leased out. [emphasis added]”¹⁴³

While one bureaucrat is by no means a representative sample, it was clear that there was an embedded status-quo that did not feel that 95% of water devoted to agriculture was a problem at all.

¹⁴¹ Khan, Muhammad Hussain. “Footprints: Sugar wars.” Dawn. Jan 4, 2019. <https://www.dawn.com/news/1455320/footprints-sugar-wars>

¹⁴² Mustafa, Danish. Personal Interview. Aug 4 2018.

¹⁴³ Anonymous Bureaucrat. Personal Interview. Aug 5, 2018.

The resistance to changing the status-quo and the refusal to reform existing agricultural policies bodes poorly for Pakistan's future. The current policy is divorced from the majority of financial compulsions of people whose livelihoods depend on the agricultural sector. It prioritizes economically privileged groups which not only breeds inequality but also leads to the production of high-water needs crops which is counterproductive for the water supply of the country. While rice is necessary for food security, products like cotton and sugarcane, which as Adeel Zafar claims have the "optics of harming a farmer" have caused detriment to Pakistan¹⁴⁴

Across our interviews, the improper state allocation of water resources, given their relative decline, was a universal theme. Fawad Khan claimed:

"If there were really a crisis, sugarcane would not have been an option. Similarly, many other crops, rice consumes a lot of water, wheat is better than rice, then millet is better than rice. People will grow according to what is available. What I am trying to say is not that we need to ditch agriculture to save water. What I'm trying to say that we need to practice agriculture that will produce enough food with the water you have. There are other ways of doing it. Interestingly, you export cotton and import food. Then there is this business of *virtual water*. Virtual water is when you produce your water to grow cotton, and you export it, what you have done is, in essence, exported your water. You've got to be cognizant of that. We're the largest exporter of groundwater in the world. If you're exporting water, you have enough water." (emphasis added)¹⁴⁵

Another expert, Ali Sheikh, acknowledged improper state priorities and mentioned that:

"Pakistan's economy in percentage terms is growing, and while a conscious decision has not been taken to move away from agriculture, we are transitioning towards other economies. The percentage of people moving out of the agricultural economy is rising too. While this might not come in the form of a policy document, it is the new reality shaping this country."¹⁴⁶

A paradigm shift is necessary. Pakistan must move away from agriculture, or at least have a vision of doing so. It seems that this is unlikely to happen until the entrenched status-quo is not overturned.

Pricing of water

With the water crisis now taking center stage in public discourse, people are quick to posit their own solutions. The Chief Justice of Pakistan believes that the solution lies in the construction of a

¹⁴⁴ Zafar, Adeel. Personal Interview. 8 August 2018.

¹⁴⁵ Khan, Fawad. Personal Interview. Aug 7, 2018

¹⁴⁶ Sheikh, Ali. Personal Interview. Aug 3, 2018.

\$14 billion-dollar dam.¹⁴⁷ Well-meaning samaritans advocate conserving water in homes and offices by doing things like taking quick showers, closing the tap when not in use, and washing cars less. Some claim that “flood irrigation” must be replaced by “drip irrigation.” Others point to unlined canals and leakage as an area for improvement. These canals and leakages lead to almost 25% of Pakistan’s water being wasted.¹⁴⁸

All these are plausible solutions. However, there has yet to be real discussion over the pricing of water.

Recently, the Planning Commission published a report, “Canal Water Pricing for Irrigation in Pakistan: Assessment, Issues, and Options,” pointing out in no simple terms that Pakistan is simply not paying the cost of the water it uses for agriculture.¹⁴⁹

Consumers of canal irrigation water pay an *abiana* charge levied under the Canal and Drainage Act, 1873, which states that “The rates to be charged for canal water supplied for irrigation to the occupiers of land shall be determined by the rules to be made by the provincial government, and such occupiers shall pay for it accordingly.”¹⁵⁰ Provincial governments publish water rates. In Punjab, until 2003, there were sporadic increases in water charges. Now the government has applied a flat rate system of 85 rupees (Rs) per cropped acre during the kharif season and Rs. 50 per acre during the rabi season. The Khyber-Pakhtunkhwa government charges up to Rs. 250 for non-food crops.¹⁵¹

This system allows provincial governments to gain revenue which could be spent on improving water infrastructure. The Punjab government, for example, manages an estimated \$20 billion in water infrastructure.¹⁵² According to water expert John Briscoe, “this would imply that the cost of replacement and maintenance of Punjab’s stock of water resource and irrigation infrastructure would be US \$0.6 billion a year” and that the government should be investing around US \$0.3 billion a year in replacement and maintenance.¹⁵³ As of 2006, the Government of Punjab’s budget

¹⁴⁷ Ahmad, Meher. “Pakistan Tries A New Way To Pay For A Dam: Crowdsourcing.” The New York Times. Oct 5, 2018. <https://www.nytimes.com/2018/10/25/world/asia/pakistan-dam-fund.html>

¹⁴⁸ Strategic Forensic Group. “The Indus Equation.” Pp 9. http://www.indiaenvironmentportal.org.in/files/Indus_Equation_Report.pdf

¹⁴⁹ Planning Commission of Pakistan. Canal Water Pricing for Irrigation in Pakistan: Assessment, Issues, and Options. June 2012.

<https://www.waterinfo.net.pk/sites/default/files/knowledge/Canal%20Water%20Pricing%20for%20Irrigation%20in%20Pakistan%20-%20Assessment%20Issues%20and%20Options.pdf>

¹⁵⁰ Article 36, 1873 Canal Act. <http://punjablaws.gov.pk/laws/5.html>

¹⁵¹ Alam, Rafay. “On Pricing Water.” The Express Tribune. Feb 15, 2012.

<https://tribune.com.pk/story/336994/on-water-pricing/>

¹⁵² Ibid.

¹⁵³ Briscoe, John et. al. 2005. “Pakistan’s water economy: running dry” Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/989891468059352743/Pakistans-water-economy-running-dry>. Pp 58.

for maintenance was about 6.5% of that benchmark.¹⁵⁴ In no way is this *abiana* pricing in Punjab sustainable. It doesn't even cover the cost of operation and maintenance costs.

With such low water prices, it is unsurprising that practices such as “flood irrigation” still occur in Pakistan. With no incentive to reduce water usage, farmers flood their fields to irrigate their land and crops. It is for this reason that Pakistan's water productivity is extremely low, leading to the needless waste of water. In 2005, water productivity stood at 0.13 kg/m³ — which is relatively small compared to Indian productivity at 0.39 kg/m³, and miniscule in comparison to the USA with 1.56 kg/m³, and Canada with 8.72 kg/m³.¹⁵⁵

Domestic water prices in urban cities are priced under flat, block-rate schedules. According to Rafay Alam, they were established to ensure “the efficient use of the resource, as well as to achieve equity, environmental conservation, cost recovery, and public participation.” However, the water experts we interviewed all unanimously agreed that the current pricing model does not encourage conservation.

Human response to incentives dictates that if water used in irrigation is priced according to available supply, demand should reduce. Studies back this up by showing that there is excess demand for water in Pakistan: people demand more water than they normally would if they had to pay the environmental and supply cost of water. Fawad Khan said:

“How do you solve this [crisis]? I'm an economist so my response would be pricing...The problem is you're getting free water...there is a genuine market failure because costs are not recovered.”¹⁵⁶

Saying that water should be priced as a commodity rather than a public good makes intuitive sense. However, several challenges must be overcome to do so. First, one must ask the moral question: is it justifiable to price water—a fundamental right that upholds dignity and life—and in turn exclude certain segments of the population that may not be able to afford it? Is it politically possible to do so? How will the public react to paying more for water?

In answering these questions, we once again turn to the largest consumer of water: agriculture. Water represents a very small amount of the cost of production.¹⁵⁷ Therefore, pricing water will not greatly affect the overall cost of any particular good.¹⁵⁸ There is a need to create incentives and expectations for rural landowners, in particular, to save water by switching to more efficient irrigation techniques. We believe the first step that needs to be taken is “metering” water in urban

¹⁵⁴ Ibid.

¹⁵⁵ Strategic Forensic Group. “The Indus Equation.” Pp 12.

http://www.indiaenvironmentportal.org.in/files/Indus_Equation_Report.pdf

¹⁵⁶ Khan, Fawad. Personal Interview.

¹⁵⁷ Ibid.

¹⁵⁸ Ibid.

localities. By measuring the amount of water consumed in a household through metering, there can be a radical reduction in the consumption of this resource. Since most landowners live in cities, metering their homes—and everyone else’s—would create a normative trend of responding to incentives and conserving water. In the years that come, we hope that this step would lead to a situation where the government has the political capital and will to push for a more widespread approach at pricing water throughout the country.

Supply-Side vs. Demand Management

As mentioned in Part I, the state had attempted to use “development” to ostensibly unify the fragmented and vulnerable Pakistani nation after partition. A key component of this was the \$30 billion (in today’s currency) “Indus Basin Project” that the World Bank helped broker in the wake of the Indus Waters Treaty. The construction of Mangla and Tarbela dams in the 1970s became symbols of national pride amongst the populace and representation of Pakistan’s “development.”

However, Mangla and Tarbela were not the only sites identified to construct a large dam. The small town of Kalabagh was also recognized as a strategic location because this is the point where the Indus River becomes a natural dam. As early as 1953, the site was chosen as the location to construct a large dam. It is this reason that at one point, the construction of the dam was considered to be more important than building a nuclear bomb.¹⁵⁹

However, due to the turbulence of the seventies and eighties—the breakup of Pakistan and the Soviet invasion of Afghanistan—the dam could not be constructed. It was only under Pervez Musharraf that the issue of Kalabagh gained traction. Musharraf wanted the dam to be built at all costs and encouraged all stakeholders to come to a consensus. However, the question of Kalabagh became a highly politicized issue in inter-provincial affairs.

The political motivations behind the opposition of Kalabagh dam between Sindh and Punjab (two provinces in Pakistan) strongly resembles Pakistan’s political motivations when it criticizes India’s projects on the Indus. Sindh is the lower riparian of the Indus river as compared to Punjab. Furthermore, Sindh is a relatively barren province in comparison with Pakistan and faces the brunt of Pakistan’s water woes. As much as 53% of Sindh’s land has been destroyed by the menaces of waterlogging and salinity, essentially rendering the land useless. In Karachi (provincial capital of Sindh), the state of water access is abysmal. Over 50% of the ten million residents of the city don’t have uninterrupted access to water. And what’s left is often unfit for consumption: a whopping 91% of water in Karachi contains sewage and industrial waste, according to a Pakistani judicial commission report.¹⁶⁰

¹⁵⁹ Iqbal, Syed Jawad. “Why Kalabagh?” *South Asia* Vol. 22 (11).

¹⁶⁰ Ebrahim, Zofeen. “91pc of Karachi’s water is unfit to drink.” *Dawn*.
<https://www.dawn.com/news/1348750>

Given the plight of many residents of Sindh, as well as the geographic fact that Punjab is the upper riparian and has access to more surface water, the issue of water has been successfully used by Sindhi politicians for short term electoral gain. By politicizing Kalabagh, and subsequently water, there is a large anti-Kalabagh lobby that has polarized the country.

Advocates of the Kalabagh dam say that its construction is a matter of life and death for the survival of the country. They cite the benefits of the dam by saying that it would provide additional water storage, generate electricity, and irrigate millions of acres of land. Opponents say that it will only heighten the imbalance between access to water between Punjab and Sindh as the upper riparian (Punjab) will have control over water flows. The sentiments have polarized the country and manage to fill the headlines: “Punjabi farmers reject 1991 Water Accord without Kalabagh dam”¹⁶¹ and “Sindh rejects construction of Kalabagh dam”.¹⁶²

There is a theory of public opinion that states that citizens are *cognitive misers*. This means that citizens form opinions on complex and technical matters that are beyond the scope of their knowledge through “filters” or “aids.” Some of these filters include identity, ideology, partisanship, gender, etc. The merits and demerits, advantages and disadvantages of the construction of complex projects such as dams are beyond the scope of understanding of the common man. Yet, people still form opinions on the matter through their predispositions. Professor Daanish Mustafa believes that Kalabagh has now become an issue of Pakistani identity.

“What is a Pakistani patriot? It has to be a Man, a Sunni, a Punjabi, anti-India, and pro-Kalabagh. If you don’t have any of these characteristics, you become a hyphenated Pakistani. It is interesting that I mentioned Kalabagh. It has become an issue of identity. That’s the discourse you’ve [the Pakistani state] promoted, the society you have built. You can go into the costs and benefits of the dam, but it is not about that — the debate is about what Pakistani polity is and should be.”¹⁶³

This discourse plays into our previous discussion on development. Adopting a neo-liberalist view of development has created a developmental paradigm; dams, technology, mass production, and consumption were the demands of the day. This thinking has not changed, and this is reflected in the fact that contemporary notions of development, particularly water resource development, have not changed. This is further evident by the almost missionary approach to the construction of Pakistan’s newest water obsession: the Diamer Basha dam.

As we were researching for this project, Pakistan tried a new way to fund the construction of a dam: crowdsourcing. Over the summer of 2018, the Chief Justice of Pakistan launched a “dam

¹⁶¹ Zuberi, M.A. “Punjab farmers reject 1991 water accord without Kalabagh dam.” <https://fp.brecorder.com/2010/04/201004031039261>

¹⁶² Editorial. “Sindh rejects construction of Kalabagh dam.” Dawn <https://www.dawn.com/news/969905>,

¹⁶³ Mustafa, Danish. Personal Interview. 4 August 2018.

fund” in attempt to crowdfund the construction of the \$14 billion-dollar Diemer-Basha dam. Officials say that the construction of this dam will solve the endemic shortages of water. Television news shows repeatedly show large donors handing cheques to the dam fund in masse, including the Pakistani football team, Pakistani politicians, government officials, and military officers. Citizens can text “dam” to the number 8000 and donate Rs. 10 (the equivalent of 10 cents) directly from their phone. These donations, however, are simply not going to be enough to construct the dam. As of Jan 12, 2019, only US\$65 million has been collected since the fund was launched in May 2018, which is a little over one percent of the dam’s estimated cost.¹⁶⁴ At this rate, it would take 120 years to completely fund the dam.¹⁶⁵

However, there is a larger problem at play here: it makes little economic sense for the government to divert this much money to one project. According the World Commission on Dams, the average cost overrun for large dams is 56%.¹⁶⁶ Diemer-Basha’s estimated cost is \$14 billion. If conservative estimates are followed, Diemer-Basha’s cost may well swell to over \$22 billion. Pakistan’s official GDP in 2017 was roughly \$300 billion.¹⁶⁷ It does not take much math to tell that with the Diemer-Basha dam, Pakistan will be roughly committing to a project equivalent to almost 8 percent of their total GDP. The biggest infrastructure project in Europe today is the Crossrail project in London at \$20 billion.¹⁶⁸ But that is being financed by the British economy, which is worth \$2.6 trillion.¹⁶⁹ The Pakistani people are being asked to make a disproportionate commitment which may not be necessary in the first place.

Dam building is a classic example of political myopia. These are short-sighted policies that appear to have great political benefit. When the government invests in something tangible that people can see—such as dams—the population is under the impression that progress is being made. This also helps politicians electorally by giving them a “ribbon-cutting” opportunity to showcase concrete work (quite literally) that the government has completed. People will be better served if the government moves away from brick-and-mortar projects to a more off-the-screen approach aimed to manage water demand, where the real solution of the water crisis lies.

¹⁶⁴ Fund Raising Status for the Supreme Court of Pakistan and Prime Minister of Pakistan Diemer-Bhasha and Mohmand Dams Fund: <http://www.supremecourt.gov.pk/web/page.asp?id=2757>

¹⁶⁵ Ahmad, Meher. “Pakistan Tries A New Way to Pay for A Dam: Crowdsourcing.” The New York Times. <https://www.nytimes.com/2018/10/25/world/asia/pakistan-dam-fund.html>

¹⁶⁶ Kadeer, Asmal. “Dams and Development.” International Rivers. https://www.internationalrivers.org/sites/default/files/attached-files/world_commission_on_dams_final_report.pdf,]

¹⁶⁷ <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=PK>

¹⁶⁸ Appiah, Lidz-Ama. “Crossrail: Inside Europe’s Most Ambitious Engineering Project.” <https://www.cnn.com/2015/10/13/tech/future-cities-london-crossrail/index.html>, [Accessed October 13, 2015.

¹⁶⁹ <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=PK>

In short, Pakistan doesn't need to build dams to solve its water crisis. There are many policy tools at hand to chart a different path for water conservation. Some are focused on agriculture: switching to less water-intensive crops, lining conveyance canals, leveling fields, using drip irrigation instead of flood irrigation, paying farmers to conserve, and eliminating politically-backed subsidies for sugarcane. Other solutions are aimed at municipal and industrial users: establishing tiered water rates, replacing inefficient water appliances with high-efficiency models, using water barrels and roof-top cisterns to collect rainwater, removing water-intensive vegetation, and replacing aging, leaking delivery pipes. Taken together, these methods can dramatically reduce water use. Prioritization to demand management in Pakistan undoubtedly will require a fundamental shift in thinking, an earnest mustering of political will, and considerable funding possibly including international and/or bilateral assistance. This shift appears essential if Pakistan's irrigated society is to continue to exist.

Recommendations

1. **Stop perpetuating the post-colonial mindset of using water as a form of control.** The ethos governing water management should now be driven by a micro-level concern for public well-being and equity, or for provision of a public service to the people.¹⁷⁰ The current structures and bodies in place should be reevaluated and reintegrated with the current discourse to better implement water distribution and allay the issue of water inequity and distribution within the subcontinent.
2. **Stop using the term "water scarcity."** Water scarcity implies that there is not enough water. In the case of Pakistan, we have proved that this is not true. There is an abundance of freshwater in the Indus Basin that can fulfill the need of all citizens if managed correctly. Neo-Malthusian theories of "not having enough" detracts from the *real* water crisis: misallocation and inequitable distribution. "Water crisis" would be more appropriate terminology.
3. **Re-allocate water away from agriculture.** According to the Pakistan Water Policy 2018, 95 percent of the water use in Pakistan is for agriculture. The vast majority of that water is used for cash crops like cotton, rice, and sugarcane for exports and not to provide food to the poor. If the commercial agriculture is the ultimate victim of water scarcity, surely it could part with just 2-4 percent of water for the domestic sector, for a few million tons less of sugarcane, rice or cotton. That could double or triple the water availability for the domestic sector and eliminate any supply problems in one go.
4. **Price water in large cities, and eventually the farms.** There currently exists no political will to start pricing water at all levels of society. The current model of flat-rates in the domestic sphere and the *abiana* charges for the agricultural sphere do not create incentives

¹⁷⁰ Mustafa, Danish. Personal Interview. 4 August 2018.

to conserve models and fall proportionately more on the poor. To ameliorate this, we propose “metering” water in cities the same way as is done with other utilities such as electricity and gas. We hope that this will start a normative trend of responding to incentives, eventually leading to the state possessing enough political will to start pricing irrigation.

5. **Focus on demand management rather than supply-side approaches.** There exists a need to look beyond supply-side solutions such as building dams and other structures to ameliorate the present crisis and look and demand control mechanisms which can enhance the future sustainability of agricultural production within Pakistan. Acts such as crowdfunding for dams only perpetuate post-colonial legacies and do little to tackle the main crisis at hand. While this requires political will, it is necessary for policymakers and politicians to look beyond projects which provide optical popular support and challenge the way of agricultural production in Pakistan.

Conclusion

Throughout the course of this paper, we have been hesitant to use the term “scarcity” to refer to the water crisis in Pakistan. This is a deliberate effort to show that there is not a scarcity of water, but instead the wrong prioritization, usage, and distribution of the available water. We believe that “water crisis” is more appropriate terminology and is one that encompasses systemic problems within the Pakistani administration, attitudes and polity. As highlighted through the course of the paper, some key elements have been the accentuation of the post-colonial mentality of water control through the perpetuation of the 1873 Canal Act, misallocation of water to agriculture, lack of water pricing in irrigation and domestic usage, and an irrational focus on supply side water management through infrastructure projects such as dams-thereby neglected demand management. While these in no way provide an exhaustive list of problems to the issue of water in Pakistan, they try to direct us to the main avenues and causes of the precarious situation of water in the country and hope to resolve them in the foreseeable future.

About the Authors

Uzair Sattar is an undergraduate at Tufts University majoring in International Relations with a specialization in Middle East and South Asia. His interest in the region stemmed from living in the UAE and Pakistan before coming to college. During his gap year after completing high school, Uzair worked in microfinance as well as a corporate law firm. In college, Uzair acts as Co-President of the Tufts International Club, Co-President of NIMEP (a Middle Eastern student think tank), and is the Founder, President, and Captain of the Tufts Cricket Club. He is also a member of Tufts Mock Trial and was a member of *HYPE!* – the only collegiate mime troupe in the country. Uzair also writes monthly columns on Pakistan’s water crisis for *SouthAsia Magazine*, which is a socio-economic and political review.

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Reference List:

- [1] Wasif, Sehrish. "Pakistan may run dry by 2025: study." *The Express Tribune*. May 30, 2016. <https://tribune.com.pk/story/1112704/pakistan-may-run-dry-2025-study/>
- [2] Kugelman, Michael. "Water Scarcity," *Dawn*. Jun 19, 2018. <https://www.dawn.com/news/1414710>
- [3] Mustafa, Danish. "Exactly how doomed are we?" *Daily Times*. Aug 9, 2018. <https://dailytimes.com.pk/280434/exactly-how-doomed-are-we/>
- [4] Ahmad, Meher. "Pakistan Tries A New Way to Pay For A Dam: Crowdsourcing." *The New York Times*. Oct 5, 2018. <https://www.nytimes.com/2018/10/25/world/asia/pakistan-dam-fund.html>
- [5] Mohan, Vishwa. "Blood and water can't flow together: PM Narendra Modi gets tough on Indus treaty." Sep 27, 2016. <https://timesofindia.indiatimes.com/india/Blood-and-water-cant-flow-together-PM-Narendra-Modi-gets-tough-on-Indus-treaty/articleshow/54534135.cms>
- [6] Aziz, Sataj. "Revocation of Indus Waters Treaty Can Be Taken as an Act of War." *Dawn*. Sept 27, 2016. <https://www.dawn.com/news/1286437/revocation-of-indus-waters-treaty-can-be-taken-as-an-act-of-war-sartaj-aziz>
- [7] United Nations Peacekeeping: "United Nations Military Observer Group in India and Pakistan." United Nations. <https://peacekeeping.un.org/en/mission/unmogip>
- [8] "Indus Water Basin: geography, population and climate war." *Aquastat*. http://www.fao.org/nr/water/aquastat/basins/indus/indus-CP_eng.pdf
- [9] Briscoe, John et. al. 2005. "Pakistan's water economy: running dry" Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/989891468059352743/Pakistans-water-economy-running-dry>. Pp 89.
- [10] Sattar, Erum et. al. "Evolutions of Water Institutions in the Indus Basin: Reflections from the law of the Colorado River." *University of Michigan Journal of Law Reform*, Volume 51, Issue 4, 2018. Aug 23, 2017. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3023589
- [11] Gilmartin, David. "Blood and Water: The Indus River Basin in Modern History." *University of California Press*. 2015. Pp 206.
- [12] Mohan, Vishwa. "Uri Attack Response: PM Modi To Take Stock of Indus Waters Treaty." *NDTV*. Sep 26, 2016. <https://www.ndtv.com/india-news/uri-attack-response-pm-modi-to-take-stock-of-indus-water-treaty-1466307>
- [13] Zafar, Adeel et. al. "Imagining Industan: Overcoming Water Insecurity In The Indus Basin." *Springer International Publishing*. Pp 12-13.
- [14] Kaushik RK, "How Ferozepur Became Ours." *Times of India*, 19 April 2016. <https://timesofindia.indiatimes.com/india/how-ferozpur-became-ours/articleshow/469742>.
- [15] Rehman, Nida. "From Artifact to Site: Understanding the Canal in the City of Gardens." Master's thesis, *Massachusetts Institute of Technology*. 2009.

- [16] Lilienthal, David. "Another Korea in the Making?" *Colliers*, Aug 4, 1951.
- [17] Haines, David. "Rivers Divided: Indus Basin Water in the Making of India and Pakistan." Oxford University Press, 2016, 38
- [18] Naqvi, Feisal. Personal Interview. 10 August 2018.
- [19] "The Indus Basin Development Fund Agreement." World Bank. Sept 19, 1960. <http://documents.worldbank.org/curated/en/239781468100481033/pdf/Loan-0266-Pakistan-Indus-Basin-Project-Development-Fund-Agreement.pdf>
- [20] Michel, Aloys, "The Indus Waters." Pp 254.
- [21] Naqvi, Feisal. Personal Interview. August 10, 2018.
- [22] 1960 Indus Waters Treaty, Available at:
<https://siteresources.worldbank.org/INTSOUTHASIA/.../IndusWatersTreaty1960.pdf>
- [23] "Avoiding Water Wars: Water Scarcity And Central Asia's Growing Importance For Stability In Afghanistan And Pakistan." US Senate Report. Pp 7. <https://www.foreign.senate.gov/imo/media/doc/Senate%20Print%20112-10%20Avoiding%20Water%20Wars%20Water%20Scarcity%20and%20Central%20Asia%20Afghanistan%20and%20Pakistan.pdf>
- [24] Naqvi, Feisal. "The Kishenganga Conundrum." *Dawn*. Nov 18, 2018. <https://www.dawn.com/news/1445800>
- [25] Article IX of the 1960 Indus Waters Treaty, Available at:
<https://siteresources.worldbank.org/INTSOUTHASIA/.../IndusWatersTreaty1960.pdf>
- [26] Naqvi, Feisal. "The Kishenganga Conundrum." *Dawn*. Nov 18, 2018. <https://www.dawn.com/news/1445800>
- [27] Fruchard, B. Camenen. "Reservoir Sedimentation: Different Type of Flushing - Friendly Flushing Example of Genissiat Dam Flushing." ICOLD International Symposium on Dams for a Changing World, Jun 2012, Kyoto, Japan. 6 p., 2012.
- [28] Akhtar, Shaheen. "Emerging Challenges to the Indus Waters Treaty." <http://www.irs.org.pk/f310.pdf>. Pp 42.
- [29] Anwar Iqbal and Khaleeq Kiani. "World Bank's Baglihar verdict may not end dispute, says expert." *Dawn*. Feb 10 2007. <https://www.dawn.com/news/232302>
- [30] Alam, Rafay. Personal Interview. Aug 10, 2018.
- [31] Bagchi, Indrani. "India Unlikely to Participate in Any Meeting in Washington on Indus Waters Treaty." *The Times of India*. March 22, 2017. <https://timesofindia.indiatimes.com/india/india-unlikely-to-participate-in-any-meeting-in-washington-on-indus-waters-treaty/articleshow/57758023.cms>

[32] Subramanian, Nirupama. "Violation of the Treaty Will Damage Ties: Zardari." *The Hindu*. Oct 13, 2008.

[33] Zardari, Asif Ali. "Partnership with Pakistan." *Washington Post*. Jan 28, 2009. <http://www.washingtonpost.com/wp-dyn/content/article/2009/01/27/AR2009012702675.html>

[34] "Water Issue A Serious Problem, says Shahbaz." *The News*. Mar 21, 2010.

[35] Sumbly, Vimal. "Baglihar Project: J&K's possible entry into 'power' zone." *The Tribune*. Dec 26, 2007.

[36] "India Plans 52 Projects to Control Pakistan's Water." *The Nation*. Mar 30, 2010. <https://nation.com.pk/30-Mar-2010/india-plans-52-projects-to-control-pakistans-water>

[37] "Betrayal charge: Senate Panel Seeks Arrest of Ex-Water Commissioner." *The Express Tribune*. Oct 2, 2014. <https://tribune.com.pk/story/770111/betrayal-charge-senate-panel-seeks-arrest-of-ex-water-commissioner/>

[38] Mustafa, Khalid. "Pak-India Talks on Kishenganga and Ratle Hydropower Projects Fail." *The News*. July 21, 2016. <https://www.thenews.com.pk/print/136475-Pak-India-talks-on-Kishenganga-and-Ratle-hydropower-projects-fail>

[39] Gupta, Joydeep. "India Suspends Indus Commissioners' Meetings." *India Climate Dialogue*. Sep 26, 2016. <https://indiaclimatedialogue.net/2016/09/26/india-suspends-indus-commissioners-meetings/>

[40] "World Bank Declares Pause to Protect Indus Waters Treaty." *World Bank*. Dec 12, 2016. <http://www.worldbank.org/en/news/press-release/2016/12/12/world-bank-declares-pause-protect-indus-water-treaty>

[41] "World Bank Group President Jim Yong Kim Visits Pakistan." *World Bank*. Feb 8, 2016. <http://www.worldbank.org/en/news/press-release/2016/02/08/world-bank-group-president-jim-yong-kim-visits-pakistan>

[42] Shahzad, Mirza Khurran. "Analysis: Indus Commissioners Talks: First Step to Composite Dialogue?" *Dawn*. Mar 20, 2017. <https://www.hindustantimes.com/india-news/india-releases-2-pakistani-teens-arrested-for-uri-attack/story-T7DdbwAHeGHsTiMhHKazTK.html>

[43] Gupta, Joydeep. "India Suspends Indus Commissioners' Meetings." *India Climate Dialogue*. Sep 26, 2016. <https://indiaclimatedialogue.net/2016/09/26/india-suspends-indus-commissioners-meetings/>

[44] Aziz, Sataj. "Revocation of Indus Waters Treaty can be taken as an act of war." *Dawn*. <https://www.dawn.com/news/1286437/revocation-of-indus-waters-treaty-can-be-taken-as-an-act-of-war-sataj-aziz>

[45] "Modi Inaugurates Kishenganga dam." *The News*. May 20, 2018. <https://www.thenews.com.pk/print/318990-modi-inaugurates-kishanganga-dam>

[46] "Pakistan Goes to World Bank Today To Protect Water Rights." *Dawn*. May 21, 2018. <https://www.dawn.com/news/1409002>

- [47] Mustafa, Daanish. "How Doomed Are We?" Daily Times. Aug 9, 2018. <https://dailytimes.com.pk/280434/exactly-how-doomed-are-we/>
- [48] Jalal, Ayesha. Personal Interview. Aug 9, 2018.
- [49] Zafar, Adeel et. al. "Imagining Indus: Overcoming water insecurity in the Indus Basin." Springer International Publishing. Pp 5.
- [50] The Hisaar Foundation. "Thirsty for Water, Sindh Braces for a Public Health Crisis." Geo TV. <https://www.geo.tv/latest/197379-thirsty-for-water-sindh-braces-for-a-public-health-crisis>
- [51] Rajput, Muhammad Idris. "Water Problem: Perspective from Sindh." Problems and Politics of Water Sharing in Pakistan. Pp 117-127.
- [52] Khaki, Saadat Bilal. "Indo-Pak and Hydro-Politics." GreaterKashmir. Jul 26, 2018. <https://www.greaterkashmir.com/news/op-ed/indo-pak-and-hydro-politics/291555.html>
- [53] Vashishth, C.R. Indus Waters Treaty: Conflict Between India and Pakistan.
- [54] Chaturvedi, AK. "Indus Waters Treaty: Options for India."
- [55] Zafar, Adeel. Personal Interview. 8 August 2018.
- [56] "Brahmaputra River: An Eternal Conflict Between India and China." Tibet Policy. Nov 2, 2017. <https://tibetpolicy.net/comments-briefs/brahmaputra-river-an-eternal-conflict-between-india-and-china/>
- [57] Mustafa, Daanish. "Colonial law, contemporary water issue in Pakistan." Political Geography Vol. 20, 2001. pp 817-837
- [58] National Water Policy 2018. Pp 1
- [59] Blomley, N. K. (1994) "Law, Space, and the geographies of power." New York, NY: The Guilford Press. Pp 11
- [60] Whitcombe, 1982
- [61] Mustafa, Daanish. "Colonial law, contemporary water issue in Pakistan." Political Geography Vol. 20, 2001. pp 817-837
- [62] Khan, Fawad. Personal Interview. Aug 7, 2018.
- [63] Ahmad, Masood. Personal Interview. Aug 6, 2018.
- [64] Anonymous Bureaucrat. Personal Interview. Aug 5, 2018.
- [65] "5 Most Water Intensive Crops." Claroenergy. N.D. <http://claroenergy.in/5-most-water-intensive-crops/>
- [66] Awan, Mansoor. Personal Interview. Aug 10, 2018.
- [67] Cheema, Usman. "Politicians, Families own 50pc of country's sugar factories." The Nation. August 23, 2009. <https://nation.com.pk/23-Aug-2009/politicians-relatives-own-50pc-of-countrys-sugar-factories>

[68] Khan, Muhammad Hussain. "Footprints: Sugar wars." Dawn. Jan 4, 2019. <https://www.dawn.com/news/1455320/footprints-sugar-wars>

[69] Sheikh, Ali. Personal Interview. Aug 3, 2018.

[70] Strategic Forensic Group. "The Indus Equation." Pp 9. http://www.indiaenvironmentportal.org.in/files/Indus_Equation_Report.pdf

[71] Planning Commission of Pakistan. Canal Water Pricing for Irrigation in Pakistan: Assessment, Issues, and Options. June 2012. <https://www.waterinfo.net.pk/sites/default/files/knowledge/Canal%20Water%20Pricing%20for%20Irrigation%20in%20Pakistan%20-%20Assessment%20Issues%20and%20Options.pdf>

[72] Article 36, 1873 Canal Act. <http://punjablaws.gov.pk/laws/5.html>

[73] Alam, Rafay. "On Pricing Water." The Express Tribune. Feb 15, 2012. <https://tribune.com.pk/story/336994/on-water-pricing/>

[74] Iqbal, Syed Jawad. "Why Kalabagh?" South Asia Vol. 22 (11).

[75] Ebrahim, Zofeen. "91pc of Karachi's water is unfit to drink." Dawn. <https://www.dawn.com/news/1348750>

[76] Zuberi, M.A. "Punjab farmers reject 1991 water accord without Kalabagh dam." <https://fp.brecorder.com/2010/04/201004031039261>

[77] Editorial. "Sindh rejects construction of Kalabagh dam." Dawn <https://www.dawn.com/news/969905>,

[78] Fund Raising Status for the Supreme Court of Pakistan and Prime Minister of Pakistan Diامر-Bhasha and Mohmand Dams Fund: <http://www.supremecourt.gov.pk/web/page.asp?id=2757>

[79] Kadeer, Asmal. "Dams and Development." International Rivers. https://www.internationalrivers.org/sites/default/files/attached-files/world_commission_on_dams_final_report.pdf,

[80] <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=PK>

[81] Appiah, Lidz-Ama. "Crossrail: Inside Europe's Most Ambitious Engineering Project."

<https://www.cnn.com/2015/10/13/tech/future-cities-london-crossrail/index.html>, Accessed October 13, 2015.