J. S. Asian Stud. 11 (01) 2023. 11-18 DOI: 10.33687/jsas.011.01.4446

Available Online at EScience Press
Journal of South Asian Studies
ISSN: 2307-4000 (Online), 2308-7846 (Print)
https://esciencepress.net/journals/JSAS

Indus Water Treaty and Water Scarcity in India: Implications for Pakistan

[a]Tahira Mumtaz, [b]Fatima Bilal*, [c]Sobia Younas
[a] *Department of Political Science, Government College Women University, Sialkot, Pakistan.*
[b] *Get Solutions Pvt. Ltd, Pakistan.*
[c] *Department of Education, Government College Women University, Sialkot, Pakistan.*

**Corresponding Author Email ID: tahira.mumtaz@gcwus.edu.pk*

A B S T R A C T

Pakistan has been facing a water crisis since the day it emerged on the map. The issue of the water crisis is deeply rooted in Pakistan's creation. The partition of the subcontinent not only divided the landmass between India and Pakistan but also the Indus River Basin. The rivers of the region were not entirely divided between the two states; they were rather shared. The water dispute was among the initial problems that created conflict between these two newly established countries. The Indus River Basin deeply affected the economy, society, culture, and political scenario of the subcontinent. Consequently, the water dispute is one of the major and initial conflicts that intertwine with the territorial disputes. The World Bank presented its proposal for the division of rivers. With the mediation of the World Bank, the Indus Water Treaty (IWT) was signed between Pakistan and India in 1960. Three Western rivers, the Indus, the Chenab, and the Jhelum, were to be given to Pakistan, and three Eastern rivers, the Sutlej, the Ravi, and the Beas, were to be given to India. The Indus Water Treaty is a permanent, binding contract between India and Pakistan. The qualitative research approach is taken while opting for the historical and correlational approach to how India faces water scarcity and Pakistan faces its after-effects. Both states are agricultural and need water for the cultivation of crops. Being an upper riparian, India controls water, so when India faces a water shortage, it ultimately affects the lower riparian, which is Pakistan.

Keywords: Indus water treaty, India, Pakistan, water scarcity, river, water, dispute, political

INTRODUCTION

This research is divided into three sections. Section I of the research explores the complex nature of water sharing between Pakistan and India, the upper and lower riparian attitudes, and the pre-Indus water treaty era. Section II talks about the post-Indus water treaty era, the political motives of India, and Factors Leading to Conflicts during water scarcity. Section III of the paper presents policy recommendations.

SECTION I: PRE-INDUS WATER TREATY

Complex Nature of Water

It was a long struggle to free the inhabitants from British rule. During WWII, the British decided to leave the subcontinent after the war. Several communities and races lived on the subcontinent. Indian Muslims demanded a sovereign Muslim state before the British left; however, Hindus opposed the division of India. On June 3, 1947, the British Government announced a plan for partition. The implementation of this plan was enacted on August 15, 1947. Partitioning such a vast country was not possible in a very short time without facing serious consequences. A dozen provinces were governed by the British, along with 562 small and large princely states. In the history of the division of the states, this was not seen before, and the division of two independent states was going to be completed in just 73 days. Burma, which is now Myanmar, got three years of independence from British India in 1937. In 1935, Sindh, as a province, separated from Bombay in about two years. Same as this separation of Orrisa from the province of Bihar was also done in two years. "Partition of none of these provinces took less than two years, contrary to a little over two months for the whole of the

Sub-Continent" (Malik, 2019).

The partition of both provinces, i.e., Punjab and Bengal, was not decided in the original partition plan. More than half of the Muslim population is part of Bengal, and Punjab has a developed irrigation system in United India. Sikhs were only five million in Punjab, but Hindus supported Sikhs for the division of Punjab. The Alliance of Hindu-Sikhs created a problem for Indian Muslims, and they were against a separate homeland for Muslims. Sikh leader Tara Singh addressed his people and said, "Oh Sikhs... Be ready for self-destruction like the Nazis and the Japanese. Our motherland is calling for blood" (Laghari, 2020). The Hindu-Sikh nexus adopted multiple strategies. First, it demanded the partition of Punjab; second, it opposed the partition of United India; and last, it hastened the process of partition (Malik, 2019). After the division, India got the status of the upper riparian state, while Pakistan became the lower riparian state because of their particular geography. The main significant issue that occurred between the two recently settled states was canal water distribution. The British provincial power had misused the water system framework development to force and perpetuate their social and monetary strength in the subcontinent.

The historical backdrop of the basin is, however, more established than in pioneer times. The incomparable Indus Progress is the seal of a large number of years of fascination with the incomparable Indus River. The two recognized urban areas of Harappa and Mohenjodaro have shocked the world with their excellence and the miracles this waterway can deliver. India and Pakistan acquired strong development through the Indus River System. Pakistan approaches a significant lump of the Indus River and is exclusively reliant on it.

Thus, the water contest is one of the major and beginning clashes that interacted with the regional questions. The water issue has been advancing since the presence of the two countries and has now indeed reached the degree of a near-future crisis because of a few components. The territorial security of South Asia is characterized by Indo-Pak clashes. The Pakistan-India struggle-based relationship rose just after the division of the subcontinent. The part analyses the foundations of the water strife in the geology of the subcontinent, the hydrology of the Indus River, the rise and improvement of various degrees of water content, and the ongoing emission of interpretational contrasts in the Indus Water Treaty (IWT).

The Origin of the Water Problem

The division of the Sub-Continent caused various essential financial or political issues, and then divisions between the twin states became the reason for conflict concerning waters over the Indus River System (IRS). Radcliffe didn't follow the boundary commission award since he chose Muslim and non-Muslim majority areas. Radcliffe outrageously divided nine princely Muslim-majority areas of East Punjab.

In 1947, the partition of the Sub-Continent took place over land, people, and rivers as well. So, the division of the Sub-Continent also changed the route of waterways and canal systems. The headworks were in India, while the area that was watered by these canals was in Pakistan. After partition, these water disputes arose between India and Pakistan. The Indus River basin was the main and only source of water for Pakistan. The inclusion of the Indus River in India became the reason for Pakistan's uncertainty.

Act, an ally British Government formed the chain of waters over the Indus Basin under single supervision (Muhammed, 2004). The But division of the sub-continent affected the Indus basin; its headwork that connects to west Punjab is dependent on these waters, and it was given under the control of India after that clash arose on water issues between India and Pakistan. (Bates, 2008). "Further important irrigated head work at Ferozepur on the Sutlej and Madhupur on the Ravi, which served as a source of two canals and fed about 1.7 million acres in Western Punjab, was given to Eastern Punjab" (Ali, 2007). "Eh, a portion of these channels were the single source of concern to proceed onward Eastern River waterways in West Punjab. The Eastern River fulfils the deem ford for these canals. India, while having the status of an upper riparian, claimed autonomous status and took control over these waters that flow down from its territory (Wagan, 2013) The interim government ended, and on April 1, 1948, India impeded the water supply to Pakistan. Natives of Pakistan were astonished, and rulers were surprised by this act. The humane government of Pakistan tried to convince them, but their pleas, antagonistic reactions, and rage did not change the decision to open canal waters from the Indian side. Pakistan accepted the Indian proposal, which was very tough to deal with, but it was necessary to force a wheat crop at that time (Bengali, 2009).

Pakistan sent three ministers for negotiations to Shimla on April 15, 1948. Jawaharlal Nehru, along with two of

his members, headed his team. Pakistan protested against the immediate stoppage of water from the Indian side and the land claimed here. Early Pakistan claimed and did not agree to release water from its side. Both states did not agree upon any decision, and talks remained unfruitful. India's stance was that Pakistan couldn't stop India from changing her plans to divert the course of water.

The Indus River Basin

One of Asia's largest river systems, the Indus River Basin (IRB), consists of the key artery, the Indus River, and several tributaries, most of which are major rivers in their own right. These include the Jhelum, Chenab, Ravi, Sutlej, and Beas rivers. Together, these six rivers carry approximately 0.2 billion cubic meters of water annually. The IRB originates in the Himalayas, the Karakoram, and the western end of the vast Tibetan plateau. This region has been dubbed the "third pole," as it contains the greatest amount of frozen freshwater next to the north and south poles. Glaciers at the third pole form a key source of flows in the IRB.

The Indus originates in Tibet and flows along the Karakoram Mountain range before entering the plains of Pakistan and emptying into the Arabian Sea. The Sutlej, too, originates in Tibet and passes through the Himalayas before entering the plains. The other four rivers begin in Indian territory, in the Himalayas (Gilmartin, 2020).

Water Scarcity in Pakistan-India

In developing countries, water scarcity is a major issue. The impact of climate change, deprivation, and poor distribution of water resources has made water the scariest natural resource in many economies. Sometimes unequal water distribution becomes the reason for conflict. The Pakistan-India water conflict is a major example of this arising tense situation of water, where water shortages are increasing the timeline, which leads to the desire on both sides to control water resources. Behind this water scarcity and depletion of water resources, overpopulation, mismanagement, and poor governance are the causes of this severe situation. Pakistan and India are the dependent states on water due to agriculture. These disputes not only hinder the way of progress but also the region, which is not benefitting from the process of globalization. Though water scarcity in some areas has become the reason for cooperation, The Indus Water Treaty is a major example of this water sharing and settlement. Though complaints are rising from both sides, this cooperation may turn into conflict.

Indus Water Treaty

Pakistan and India were part of the subcontinent before their separation. But after seven months of their separation, India deliberately stopped the water supply to Sutlej. This water flowed on the border side of Punjab, and the food production of the people was dependent on it (Frenken, 2012). It was a high threat to the agriculture sector of Pakistan. There was an agreement for water distribution between India and Pakistan that ended on March 21, 1948. Later, on May 4, 1948, these countries understood the water conflict and agreed on the point that the river flow would not be disrupted until Pakistan looked for other water resources (Begum, 2011). The World Bank intervened in this matter in 1960 and joined these countries in one agreement called the Indus Basin Water Treaty (IBWT), or simply the Indus Water Treaty. This contract covered the water problems in these countries. In this agreement, it was accepted that Pakistan would be given three western rivers and India would be given three eastern rivers. The Three western Rivers given to Pakistan were the Indus, Jhelum, and Chenab, and the three eastern rivers given to India were the Beas, Ravi, and Sutlej (Mustafa, Akhter & Nasrallah, 2013). This treaty also granted India some preferential privileges over non-consumptive applications. India and Pakistan are still following this treaty, although they have fought three battles against each other.

The Indus Water Treaty is considered a successful agreement that has resolved the conflict between two countries, even though they fought four major wars against each other. This treaty has resolved the water conflict across the border but has led to many disputes between the provinces of Pakistan. The crops in Southern Punjab are irrigated by a canal system. This canal system is the world's largest canal system. But unfortunately, despite having the largest canal system in the world, Pakistan is unable to settle the water disputes between Baluchistan and Sindh and Punjab and Sindh. Moreover, India has built dams and hydroelectric projects on the rivers coming to Pakistan (Briscoe *et al*., 2006). These projects are creating discord between these two countries because they control the flow of water coming to rivers in Pakistan, and these rivers are the only source of water needed. The major hydroelectric projects in India built from the perspective of this cause are Salal

Hydroelectric Power Station, Baglihar Hydroelectric Power Project, Kishanganga Hydroelectric Plant, and Ratle Hydroelectric Plant. These dams are causing water conflict between India and Pakistan (Mustafa, Hydropolitics in Pakistan's Indus Basin, 2010).

Salal Hydroelectric Power Station, or Salal Dam, is built on the Chenab River, which was given to Pakistan under the Indus Water Basin Treaty, and India is controlling its water flow through this dam. Moreover, Baglihar Dam is also built on the Chenab River, which originates in the disputed territory of Jammu and Kashmir. India is trying hard to get control over the western rivers given to Pakistan. For this purpose, it has started a large number of water projects in Jammu and Kashmir, including the Dulhasti Hydroelectric Project, Dumkhar Project, Uri Hydroelectric Projects 1 and 2, Chutak Barrage, Nimoo Bazgo Project, Bursar Dam, and Pakak-Dul Dam (Atef *et al*., 2019). These water projects are being operated without proper planning and strategy to make the canal system of Pakistan ineffective, thus damaging the agriculture sector of Pakistan. The goal of India is to stop the water of the River Chenab for 25 days by building dams; it has already completed 14 hydropower projects in this regard. Resultantly, 7 million acres in Punjab, which is irrigated by the Chenab River, will be barren, and the crops will be destroyed (Mustafa, Hydropolitics in Pakistan's Indus Basin, 2010). The Kabul River originates from the Hindu Kush Falls in the Indus River. Farmers in Khyber Pakhtunkhwa depend on the Kabul River Basin (KRB). India is also starting hydropower projects on the KRB to increase pressure on Pakistan for water (Malik, 2018).

SECTION: II POST INDUS WATER TREATY

Political Motives of India

The Indus Water Treaty created an atmosphere of understanding between the two nuclear states. Six rivers are the Beas, Ravi, Sutlej, Jhelum, Chenab, and Indus. India built a hydroelectric plant in the Doda district on the Chenab River during the 1990s. Political and religious groups in Pakistan saw this move as evidence that India wants to control these rivers. India breached this treaty. In this way, Pakistan's economy could be affected by agriculture and animal-rearing activities. Excess water released by India in wartime becomes water in Pakistan. In this way, India shows its political hegemony in the region by controlling this water resource, which becomes the reason for conflict and tension between both states.

Factors Leading to Conflicts During Water Scarcity

Many factors become the reason for conflict between two countries that share insufficient resources. Most of the disputes appear once it is a common observation that one group is benefiting from the share on behalf of another group. It becomes scarcer when the demand for natural resources is very high, but on the other hand, resources are scarce. Conflict over water sharing is an example of this reality. Factors that are leading to conflict due to water scarcity are discussed below.

Over Population

Population growth is the major problem, which becomes the reason for the overconsumption of natural assets and pressurizes these resources. In this circumstance, this may lead to disharmony and conflict. In many countries, overpopulation is a very big issue because it exhausts these available resources, or there is no balance between demand and supply of water, which leads to conflict. Water is consumed for agriculture, and insufficient fresh water may cause political instability. In these cases, tensions arise between citizens over the right to access safe drinking water. This problem may arise at the local level and escalate to an issue at the worldwide level in the India-Pakistan case.

Poor Treaties

A major source of conflict is weak or poor treaties. Weak treaties are those that do not address the current situation, are ambiguous, do not look forward, and have loopholes, among others. Each party seeks its own benefits from the treaty and wants to gain the maximum share of it. When, with time, one party realizes that the treaty does not favor them, they respond by revisiting its features, and sometimes they want to withdraw it. Instability in relations and the inability to focus on future trends are the major causes of weak treaties between India and Pakistan. When this treaty was signed between India and Pakistan, water needs were not considered seriously in the upcoming period.

Inadequate Water Management Measures

When a natural resource is discovered, it is exploited until it is depleted. Countries do not understand the circumstances and misuse them. A lot of poor states do not preserve water, even though it is a very basic human

need. These states are incapable of fulfilling the demands of their inhabitants due to a lack of water preservation. Sometimes, these water resources dry up or decline. Pakistan's water level is declining due to mishandling and having no reservoirs to save this natural resource. Also, the country is unable to satisfy its citizens demand for water. Inadequate water supply is another cause of water shortages. In this way, countries blamed each other for water shortages that later became the reason for conflicts.

Water Distribution

The Indus Water Treaty was signed to resolve water disputes between two countries and provide them with the water bodies they deserve. India was given complete control over Ravi, Sutlej, and Beas. And it was given the power to use it to any extent and start any project on it. On the contrary to it, Pakistan was given control of the three western rivers including the Chenab, Indus, and Jehlum (Basharat, 2019). However, one thing to notice in this agreement is that India was restricted from any type of interference in the river water flow coming to Pakistan. However, India has more control in this treaty, as the water of the Ganga, which belongs to Bangladesh, is also under the control of India (World Bank, 2018).

Pre- and Post-Indus Water Treaty

The Indus water treaty, which was supposed to solve the water conflict between India and Pakistan, is increasing the complexity of the situation. The reason why the Indus Water Treaty has failed to resolve many Water conflicts is that the boundaries stated in this treaty are false. The reason for this agreement was to get control over a situation and the water that flows in six rivers (Miner, 2006, 205). The Indus Water Treaty is considered a successful agreement that has resolved the conflict between two countries even after their overconsumption of major wars against each other. The plan attempts to build up a relationship of common trust between the two countries. The arrangement likewise builds up the component of the debate goal through the honors of the Neforral Expert and the Court of Arbitration, the choices of which are authoritative (Nax, N. A., 2016).

Pakistan's Response

Pakistan dismissed all claims made by India that the purpose of the barrage was navigation and transportation, as the roads between Baramullah and Sopore were completely fine and the distance was shorter by road than through the water channels. Pakistan likewise stood up and said that it couldn't subordinate its employment of western streams to the necessities of upstream. Regardless of whether India needed to utilize water channels, it could do so through the level base vessel.

Loopholes in the IWT

The fact that all the writings and data we found on the subject of the Indus Water Treaty are biased analyzing the real facts and identifying loopholes is not easy. The reason is that the Indian authors are of the view that all the western rivers originate from India, so India must have rights and control over them. India may allow Pakistan to get some portion of it under the acceptance of political and other conditions specified by the Indian government (Khan, 2020). They think that the IWT is itself a blunder, and there was no need for any such written document that guides India about the use and flow of water, which are already part of it. By giving the western rivers to Pakistan, IWT is protecting the interests of 25 million individuals in Pakistan but ignoring the 21 million people in India who are also dependent on them. In contrast to it, the Pakistani commentators are seen complaining of the injustice done in agreement along with the violation done by India through building dams for storing water from western rivers (Biswas, 1992). The Indian projects of Kishenganga and Baglihar were opposed by Pakistan as they were supposed to violate IWT (Haines, 2016). Future insecurity and climate change were completely ignored in this treaty, which is a loophole. One major mistake in IWT is the focus on political reasons rather than national responsibility and water needs (Zhongming, 2020).

Water sharing between India and Pakistan

The majority of water needs are fulfilled by the Indus River in Pakistan. There are water disputes between Pakistan and India. The lower regions of Pakistan are flooded each year because India releases excess water from dams. Pakistan has no dams on its way, so this water creates trouble for it. Pakistan is an arid country that ranks fourth in the world in terms of water consumption. The single source of water is the Indus River for Pakistan, which has six other tributaries comprising Chenab, Sutlej, Beas, Jhelum, and the Indus

River (Tariq & Van De Giesen, 2012).

The water of the monsoon in summer also falls in these rivers, which average 494 millimeters every year. The water in these rivers comprises rainwater, glaciers, and snow melt. The surface water in the Indus River is 20 to 258 cubic kilometers, out of which about 190 cubic kilometers fall in Pakistan. From this surface water in the Indus River, 50 cubic kilometers of water are coming from underneath the surface ground. Discussing this water proportion in percentage, we can say that almost 83% of water is groundwater and 74% is surface water available in the Indus River (Laghari, Vanham, & Rauch, 2012). The water provided by the Indus River is sufficient to meet the requirements of 300 million individuals (Frenken, 2012). Three countries—Pakistan, India, and Afghanistan—depend on the Indus River for cultivation. This sole river has become a bone of contention between these three countries due to food supplies (Wescoat, Halvorson, & Mustafa, 2000).

Water sharing remained a current issue despite the fact that the Indus Water Treaty signed between India and Pakistan decades ago had a remarkable precedent whose significance has yet to be repeated in any domain between the two states since then (Pathak *et al*., 2014). This is also the reason that there was a security problem surrounding water use and water resources. In recent years, however, water has become a popular point of conversation in Pakistan due to increased water scarcity, and the condition has contributed to political, ethical, and regional debates in South Asia. Water has now become a significant point of discussion. Pakistan was the natural claimant due to the lower riparian during this dispute (Desai, 2016). Just as terrorism and Kashmir issues are unfinished points of contention, the water dispute has now developed a similar position. The problem of rivers flowing from the Indian-controlled state of Kashmir to Pakistan was a late flash point between two nuclear neighbors who have waged almost four wars since independence (Scheuring & Engelbert, 2002).

The building of Dams by India

India is disturbing the water flow by building dams on the rivers of Pakistan. These rivers originated in Jammu and Kashmir, which is an occupied territory of India. Construction of these dams and water projects on the western rivers is a violation of the Indus Water Treaty. The purpose of building the PakalDul Dam is to store water and deprive Pakistan of this water (Thatte, 2008). Building dams on the rivers that are shared by two countries and storing their water in a situation where the other country's irrigation system is completely dependent on this water is a clear violation of this Treaty and is inhumane. This dam will store water above 11,000 acre-feet, above the allowed limit. Moreover, it will store 88,000 acre-feet of water coming from the Chenab River. The construction of this project was initiated in 2018, and it will be completed in the estimated time of five years (Hasan, 2018).

The Water Shortage Situation in India: Implications for Pakistan

The growing demand for water in India is becoming dangerous. The weak administration of assets has led to a low quality of water, presenting challenges for access to safe water and its preservation. Today, the water cycle has changed in a large portion of India's watercourse because of land use changes, inter-river moves, water system changes, and seepage. The sustainable development of water has taken on much more importance nowadays. An evaluation of the accessibility of water assets, taking a record of the increasing demand and effects of environmental change, and fluctuation are vital for planning the empirical step up as a reason for financial growth. The water situation in India is critical, as almost 330 million people are deprived of clean water because of a lack of monsoons in the last few years. As the water resources of both countries are somehow related, the water conservation strategy and water usage policy should be decennial to rearrange the impact of the water situation in one country on the other. The composite water management index Report published in 2018 says that the major cities of India will have zero by the end of 2030, which will affect more than a hundred million people. This is identified as a very serious situation that needs immediate action. (Akhtar, D. S. 2010, 66).

The Need for New Infrastructure and Mechanisms

There is a need for new infrastructure, as the old one in IWT has failed to cope with the current challenges, which are reducing its effectiveness. India was bound to use a maximum of 20% of the water from the Indus River, but now it is claiming its right to the water, and thus the Indus Water Treaty seems to have come to an end. The revised Indus Water Treaty is supposed to include climatic changes and the increasing population as major factors. Although a clear picture of the revised IWT is

impossible to draw, it will also include many political factors and Engineering considerations. However, the new agreement is expected to be based on goodwill and the intention of mutual benefit, for sure. (Alam, U. Z. 1998).

SECTION III

Policy Recommendations

- There is a need to make a new agreement between the two countries to focus on all the important factors not considered in the old agreement.
- Making a new agreement can be difficult immediately as it requires research in various aspects, so it is better to include the identified pitfalls in the project.
- Both countries should try to completely follow this treaty. It will help the other country remain fair with it.
- This treaty is based on justice and mutual sharing, so this factor should remain alive while following it. The enthusiasm shown by both countries in signing this agreement can be revived again following this treaty.

CONCLUSION

In this research, we have discussed in detail how the Indus Water Treaty is resolving the water conflict between the two countries. This agreement is considered one of the successful treaties because it even survived the period of war despite all the conflict and the critical situations in the relations between both countries. This treaty is silent in its place. We have observed the role of the World Bank as a mediator in resolving the water dispute because the water dispute is disturbing the relationship between Pakistan and India. The rivers are coming to Pakistan originating from Kashmir, which is a territory that India has military control over. India is building a Dam in Kashmir to increase its water storage capacity, the objective of which is to deprive Pakistan of water. We also observed the pitfalls in the Indus Water Treaty, like the fact that it did not cover the current factors, making it less effective and difficult to implement in the future. These factors primarily include climate change and changes in the natural environment. Based on all the facts mentioned, we conclude that this agreement needs to be revised.

REFERENCES

Ali, K. F., & De Boer, D. H. (2007). Spatial patterns and variation of suspended sediment yield in the upper Indus River basin, northern Pakistan. *Journal of Hydrology*, *334*(3-4), 368-387.

Ali, M., Kumar, S., & Khoso, P. A. (2018). Institutional Analysis of Water Governance in Pakistan. *Glob. Leg. Stud. Rev*, *3*, 10-20.

Alam, U. Z. (1998). *Water rationality: mediating the Indus Waters Treaty* (Doctoral dissertation, Durham University).

Akhtar, D. S. (2010). Emerging challenges to Indus Waters treaty. *Regional Studies*, *28*(4), 3-66.

Bank, W. (2018). Brief Fact Sheet: The Indus Waters Treaty 1960 and the Role of the World Bank. *World Bank) Retrieved October*, *23*, 2022.

Bates, B., Kundzewicz, Z., & Wu, S. (2008). *Climate change and water*. Intergovernmental Panel on Climate Change Secretariat.

BBC. (2020). *What is climate change? A really simple guide*. Retrieved from https://www.bbc.com/news/science-environment-24021772

Bengali, K., &Gazdar, H. (2001, April 1). Resolving the water crisis, *Dawn*.

Biswas, A. K. (1992). Indus water treaty: The negotiating process. *Water international*, *17*(4), 201-209.

Haines, D. (2016). The Indus Waters Treaty has always been controversial, but Modi is wise to resist calls to abrogate it. *South Asia@ LSE*.

Khan, A. J., Koch, M., & Tahir, A. A. (2020). Impacts of climate change on the water availability, seasonality and extremes in the Upper Indus Basin (UIB). *Sustainability*, *12*(4), 1283.

Laghari, A. N., Vanham, D., & Rauch, W. (2012). The Indus basin in the framework of current and future water resources management. *Hydrology and Earth System Sciences*, *16*(4), 1063-1083.

Malik, T. (2019). Pak-Afghan Water Issue: A Case for Benefit-Sharing. *Policy Perspectives*, *16*(1), 77-98.

Miner, M., Patankar, G., Gamkhar, S., & Eaton, D. J. (2009). Water sharing between India and Pakistan: a critical evaluation of the Indus Water Treaty. *Water International*, *34*(2), 204-216.

Muhammed, A., Stewart, B. A., Mitra, A. P., Shrestha, K. L., Ahmed, A. U., & Chowdhury, A. M. (2004). Water resources in south Asia: An assessment of climate change-associated vulnerabilities and coping mechanisms. *Asia-Pacific Network for Global Change Research. Retrieved November*, *19*, 2022.

Nax, N. A. (2016). *Looking to the Future: The Indus Waters Treaty and Climate Change* (Doctoral dissertation,

University of Oregon).

Thatte, C. D. (2008). Indus waters and the 1960 treaty between India and Pakistan. In *Management of Transboundary Rivers and Lakes* (pp. 165-206). Springer, Berlin, Heidelberg.

Wagan, F. H., & Khoso, S. (2013, December). Water shortage: its causes, impacts and remedial measures. In *6th International Civil Engineering Congress*, 28, 1-6.

Zhongming, Z., Linong, L., Xiaona, Y., Wangqiang, Z., & Wei, L. (2020). Global Warming Influence on Extreme Weather Events Has Been Frequently Underestimated.