Citation: Alam, A. (2021). I Global Climate Change: Challenges and Opportunities for Pak-Afghan Trans-boundary Water. *Global Strategic & Security Studies Review, VI*(II), 149-161. https://doi.org/10.31703/gsssr.2020(VI-II).15

DOI: 10.31703/gsssr.2021(VI-II).15 **p- ISSN:** 2708-2121 **e-ISSN:** 2708-3616 **L- ISSN:** 2708-2121

Global Climate Change: Challenges and Opportunities for Pak-Afghan Trans-boundary Water

Pages: 149– 161 | **Vol.** VI, **No.** II (Spring 2021) | **URL:** http://dx.doi.org/10.31703/gsssr.2021(VI-II).15

Aftab Alam *

Abstract *The Water and weather, which is the delicate balance between evaporation and precipitation, is the primary cycle through which climate change is sensed. Scarcities of natural resources, floods, rapidly melting of glaciers along with fast sea-level rising, and storms are worsening or changing as our climate changes, with frequently fatal consequences. Freshwater accounts for only three percent of the total water on the earth, about 2/3 frozen in glaciers and glacial ice. Based on up-to-date climate estimates for the protection of water, we are at the moment passing through a challenging time, and the global population expected to surpass ten billion by 2055 would also be a challenging assignment, particularly for lower developing countries. In this research paper, we focused on some issues generally and particularly in the context of Pak-Afghan relations. Because, despite their geographical, linguistic, regional, religious, and ethnic entanglements, Pakistan and Afghanistan's bilateral ties have seen turbulence. Aside from classic security threats, like terrorism and extremism, foreign military intervention, jihadist Movements, dictatorship, and inter and intra-level wars, Pakistan and Afghanistan are confronted with a serious non-traditional security danger, namely the issue of Climate Change over population.*

Key Words: Global Climate Change, Kabul River Basin, Dictatorship, Security Threats

Introduction

Geographic closeness, language, culture, religion, regional and tribal alliances, and ethnic nodes are only some of the ties that bind Pakistan and Afghanistan. Despite their differences, they went through a catastrophe of interrelationships. The regional and international dynamics of power politics have exacerbated the hostility between two neighbors. The Major irritation-Durand Line, pointing, refugees, Afghanistan's Indian policy-continues to influence their interrelationships. In addition to struggling with myriad traditional security challenges, both countries are facing Extreme non-conventional safety threats, i.e., the difficulty of shared waters with no regulatory mechanism. Both nations are following a unilateral Water Sector Strategy on shared rivers without consulting the co-riparian (Ahmar, 2021). This particular research work is divided into five sections. The first section explains how water poses a non-traditional security threat, delves into the theoretical framework of security, making the water as a rare natural resource a security agency and water in the future. Shows that those who can manage will be beneficial. The second section briefly describes the international treaty system on crossing water to highlight the principles of interest-sharing cooperation that can be applied as a model to the current situation between Pakistan and Afghanistan. The third section describes cross-flow and

*Ph.D. Scholar, Center for South Asian Studies (CSAS), University of the Punjab, Lahore, Punjab, Pakistan.
Email: Aftabms18@gmail.com

future water projects between the two countries that may affect the flow of Pakistan's rivers and may start in the eastern part of Afghanistan. The fourth section briefly describes Afghanistan and Pakistan's concerns about shared water. Finally, this paper analyzes the application of the principle of sharing interests by the two states and makes recommendations on how the problem can be solved.

Pakistan and Afghanistan proportion waters of 9 rivers; however, still, they have signed no settlement on the way together to govern and control the shared water sources. This might also additionally turn out to be a first-rate difficulty as ongoing electricity and irrigation tasks upstream in Afghanistan, especially on shared water of the Kabul River Basin (KRB) might also additionally affect water glide downstream in Pakistan. Similarly, any diversion at the Chitral River on Pakistan`s aspect of the basin might also additionally have a bad effect on groups residing in the Afghan aspect of the basin. The shared waters can, as a consequence, turn out to be a critical irritant among both riparian states because of the absence of any regulatory framework. They are currently pursuing a unilateral water strategy. Joint water projects between Afghanistan and India exacerbate the situation, as Pakistan already has problems with India owing to an increase in the number of Indian projects on western rivers. Though water is vital for Afghanistan's agriculture-based economy to revive, the projects on the Kabul River might have major consequences on downstream irrigation and enterprises, the environment, and diplomatic ties between Pakistan and Afghanistan. Water as an environmental security concern is inextricably linked to conflicts between nations and communities, and it must be addressed with the same seriousness as traditional security threats. The likelihood of a future war over shared water has not been adequately addressed, according to this report, which examines security attitudes in Pakistan and Afghanistan. Rather than sharing water or making unilateral decisions, we need to develop an evidence-based integration mechanism that shares benefits. So on the basses of the above arguments and previous historical facts, we concluded that Shared Rivers are not just anticipated to generate conflict, but they may also help riparian governments establish engagement and collaboration. Several rival riparian nations have publicly decided mutual benefits in certain cases and properly developed their collective concern about water resources, particularly in the recent two decades. In the South, several agreements have been drafted related to mutual transnational river basins. The Zambezi, Mekong, Jordan, Ganges, and Nile Rivers are notable examples (Salman, 2006). However, with the increasing demand and shrinking quantity of all kinds of water assets, these agreements are currently under tremendous strain. Furthermore, long-standing variations in the amount and configuration of surplus in these interconnected tributary arrangements are a distinct possibility as a result of global climate change (Ebrahim, 2019).

Water Deviation by Afghanistan and India

Pakistan has a two-fold water problem. First, there is a dispute amongst provinces above the allocation of Indus River water, and secondly, the issue of environmental changes is causing water shortages, especially during the winter, summer, and fall seasons. In view of the urgency of the water crisis and dispute, the Water Apportionment Accord (WAA) was signed by Pakistan's provinces on March 16, 1991, and supported by the Council of Common Interests (CCI) on March 21, 1991 (Report, 2022). The WAA established the Indus River System Authority (IRSA), which has offices in Islamabad, to oversee and monitor the distribution of water from the Indus River. IRSA is a groundbreaking agreement between Pakistan's provinces to address water difficulties, particularly among the three Indus River basin beneficiaries: KP, Punjab, and Sindh. Punjab and KP are higher riparian Units, but Sindh is downstream and routinely protests about Indus-water shortages. According to a segment of the press, prominent Sindh water, and environmental specialists recently cautioned that "Punjab's obstinacy would inflict catastrophic harm on Sindh's agro-economic if the province is allowed to get away with its water pilferage." "All field canals in Punjab are consistently filled with water," they said, "despite an acute scarcity in the Indus River and significant drops inflows at the Kotri barrier, generating drought-like conditions in the Laar-region; of the province."

During CCI and IRSA meetings, officials from Sindh frequently complain that their province receives less water than KP and Punjab. "The Sindh Assembly was informed on May 6 that there was an acute shortage of water in the province because it was not receiving its due share as per the Water Accord 1991, and that if the situation persisted for another 10 days, it could lead to a water crisis in Karachi and other parts of the province." Furthermore, Syed Sardar Shah, the provincial minister for Culture, Tourism, and Antiquities, stated during a discussion in the Sindh Assembly that "there was a water scarcity of over 22% in Sukkur Barrage and 44% in Kotri Barrage." If one province [Punjab] retains its monopoly on Indus water, federal peace would be jeopardized. There is an urgency to increase an incorporated mechanism primarily based totally on the essential precept of gain sharing in preference to dividing waters or any unilateral developments. In the idea of gain sharing, there may be a focal point for far from sharing volumes to sharing advantages derived from water sources. Likewise, is the shift in technique from `Our water` vs. `your water` which leads to a zero-sum sport, to a wonderful sum sport, treating water as a `not unusual place pool`. It makes a specialty of harnessing and sharing efficient ability of water sources for the most gain of groups and economies. A cooperative improvement of shared water sources will allow each of the riparian states to make the most of the total ability of the Kabul River and could offer a clean street toward a cautiously chalked out water-sharing regime or treaty. Instead of dashing into an all-encompassing treaty dialogue, both states can first discover promising avenues for cooperation in dam improvement, watershed management, enhancing efficiency, coping with floods and droughts, layout and infrastructure, statistics sharing, and institutional arrangement. With this in mind, this article attempts to bring water into the realm of security as a non-traditional security threat. He emphasized that common water issues should be urgently addressed to avoid intensifying water conflicts that threaten local states, communities, ecosystems, and peace. She argues that the two countries have problems with their perceptions of security and that the possibility of future conflicts over shared water has not been fully considered (Awan, 2018).

Water as a non-traditional security threat

The world's security environment is constantly changing with changes in security discourse. More comprehensive security that covers a wider range of non-traditional threats facing the state, from security as pure military security to environmental security, human security, food, health, and social security. Until Water security and water-related social and ecological security threats are well-positioned in this broader understanding of security. Globalization, urbanization, industrialization, the rapid pace of population growth, and the consequent rapid depletion of natural resources are more realistic threats than weapons, and the military climatic issues can lead to confrontations between national and local interests, according to Peter Gleick. "If this century's battle is fought over oil, the next century's conflict will be fought over water," Ismael Serra Gildin, then Vice President of the World Bank, said in 1995 (Azam, 2015).

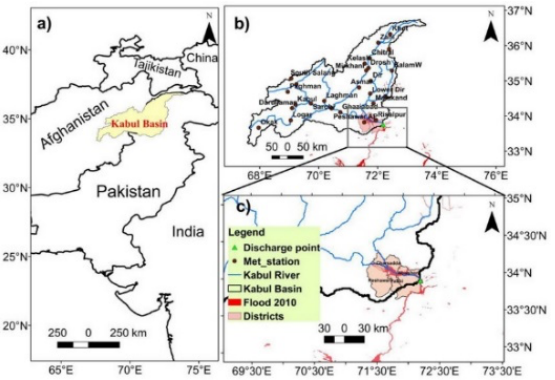


Figure 1: Trans-boundary water structure

Pakistan and Afghanistan are members of South Asia's hydrological society. Trans-boundary Rivers are distinguishing characteristics of such communities. Pakistan is dry and semi-arid, with an annual rainfall of less than 375mm (Sayal, 2011). Its primary sources of water are ground and surface water. Pakistan is dependent on a single river basin, unlike Afghanistan and India, with which it shares its rivers. Jhelum, Chenab, Ravi, Beas, and Sutlej, as well as other minor tributaries, enter the river on its eastern bank. On the western side, The Kabul River and its tributaries flow into the Indus River, a late-arriving river with a length of 2900, kilometers and a drainage area of 966,000, square kilometers. Seasonally and yearly, the river flow changes throughout the year (Ahmad, 2020).

Table 1. Availability of Water per Capita/year in Pakistan and Afghanistan

Year	Population, in Million (Pak)	Water availability, (cubic meter)	Population, in Million (Afghanistan)	Water availability, cubic meter	World Criteria
1960	54	4262	10.3	5260	
2011	174	1064	25.5	3023	1000m3/capita threshold value
2020	205	876	33.2	985	
2024	2022	807	34.5	750	

Source: *Irshad Ahmad khan, Allah Bakhsh Sufi, Shahid Hamid and Wassay Gulrez, "Construction of Large and Medium Dams for Sustainable Irrigated Agriculture and Environmental Protection," in World Environment Day: Green Economy-Does it Include You? ed. Ghulam Hussain (Lahore: Pakistan Engineering Congress, 2012).*

Water is the basic need for survival of mankind and developments of the economic infrastructure of any state in the world states system. The most important duty of any political government is to provide basic needs and fulfill the basic rights of their citizens. Pakistan and Afghanistan are close neighbor and important states in the South Asian region due to their geographical location. Along with their importance, both states have been under severe threats for the last several years because of some socio-economic and political issues. The US intervention in Afghanistan, the issues of terrorism along with political instability have severe impact on Pak-Afghan relations. So along with all these issues the global climate change is a threat multiplier because of high vulnerability in both sides. We have different examples of climatic issues in both countries' relations like food scarcity, flood, droughts, refugees, fresh and hydro water issues, glaciers melting, rivers and tributes issues. Therefore, it is important for both states to rationally think about the serious issues of climate change generally and particularly the Kabul River water legal status because this is the only freshwater resource which has a great impact on agro-economic development of both countries. Availability of water per capita is directly connected with population because whenever population increases, it will cause water scarcity, but along with population increase, climate change is another valid cause of water scarcity. So, for the last couple of decades, as we have mention in the above table that on, both side along with population increasing the water and food demand are also increasing and as a result due to climate change it is difficult to manage.

Table 2. Availability of water for Agricultural land in Pakistan and Afghanistan

Annual data	Pakistan	Annual Data	Afghanistan
Average water Flow	138.7 MAF	Average water Flow	75 BCM
water available at canal heads	104.2 MAF	water available at canal heads	55.4 BCM

water reaches at the farm gate	57.4 MAF	water reaches at the farm gate	20.4 BCM
System loses	44.9 MAF	System loses	27.8 BCM

Source: *Ahmad khan, Bakhsh Sufi, "Water Resources of Pakistan," in Pakistan Engineering Congress in retrospect, 1912-2012: Centenary Celebrations (1912-2012), ed. Ghulam Hussain (Lahore: Pakistan Engineering Congress, 2012),*

Pakistan and Afghanistan are developing countries and mostly depend on agriculture land to support their economies. Agriculture is like the back bone for the development of any country. But the important thing for survival of agro-economy is Rivers and Tributes because if there is no water, there will be no life and agriculture. So both are interdepend and closely linked, but the utmost important question here is the issue of water demand because on one side due to population increase the fresh drinking water along with food demand is also increasing and to fulfil both demands we need rich water resources, which is difficult to protect due to climate change. This is not the case only in Pakistan and Afghanistan, but the same issue is facing most of the world states. If one state is trying to fulfill the desires and demands, the other will be in threats and dangerous. So to resolve the issues of global climate change, it is important for world states to take serious actions and make rational policies and laws regarding trans-boundary water issues.

Table 3. Water demands for agriculture and domestic use in Pakistan

Water demand for Agricultural land (MAF)			
Crops	1992	2003	2026
Wheat	25.27	27.8	55.91
Rice	17.78	21.24	15.68
Cotton	12.68	14.71	18.35
Sugarcane	11.34	13.42	13.92
Other Crops	28.91	30.60	45.73
Total losses (70%)	**165.31**	**185.30**	**257.12**
Domestic use of Water			
Years	1992	2003	2026
Population (Million)	111	141	261
Demand of water	4.2	5.4	9.9

Pakistan is an important state in the South Asian region because of its rich geographical location. The rich geographical location means the importance of their land in the context of natural resources. Pakistan is the only country in the world which has four different seasons per year like spring, winter, summer and fall, but right now in 2022, the situation is going to change due to global environmental issues and climate change. The global environmental issues has severe impact on South Asian region and Pakistan is also one of them. This is the real fact that Pakistan has very low contribution in environmental degradation but unfortunately for last several years have been effecting severally. The issue of climate change is basically a direct threat to the socio-economic structure of Pakistan because Pakistan is an agriculture-based economy. The population is increasing day by day and as a result the demand of food and water is also increasing but poor governance and political instability along with insecurity on borders

make it difficult for authorities to take right decisions at correct time.

Being an agricultural-based economy, Pakistan is mostly depend on neighbor's water. In this connection India and Afghanistan has great importance because Pakistan depend on both countries for fulfilling their water demand. In this connection Pakistan and India have signed, the a treaty regarding water issues name as, Indus Water Treaty, in 1960 with the help of World Bank regarding trans-boundary water sharing and still both countries are using water under that legal status but recently India allocate some budget to construct some dames for fulfilling water demands of their citizen which is again a challenge for Pakistan because such dames will definitely low the water flow towards Pakistan. The Kabul river basin between Pakistan and Afghanistan is also another challenge because both countries are highly water-stressed and severally vulnerable to climate change. Afghanistan's population was 39.8 million people in 2021. Afghanistan's population has risen sharply during the last 50 years, from 12.8 billion to 39.8 billion people, at a rate that peaked at 9.19 percent in 1993 and then fell to 3.33% in 2021 (Ahmad S. , 2010).

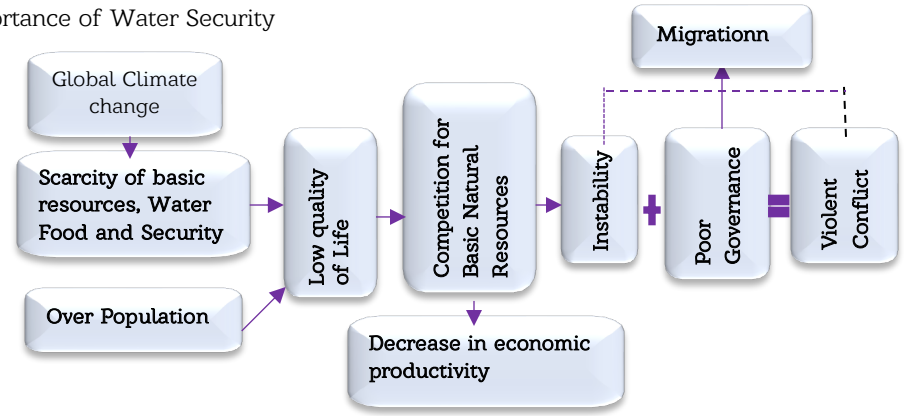
Table 4. Current and future demands of water

S. No	Sector	2016	2021	2026
1	Agriculture	112	115	120
2	Industry	4.30	4.60	4.20
3	Municipal	8.11	9.12	11
4	Environment	1.60	1.70	1.74
5	Total	126.01	130.41	136.94

Source: *Ahmad, Sufi, Hamid and Gulrez, "Construction of Dams of a Large and Medium Size for Long-Term Irrigation and Environmental Protection.*

The Kabul River flows from Afghanistan's Hindukush Mountains' Sanglakh range, sustaining the livings of billions of individuals in the Pak-Afghan region. It provides between Ten percent and Twelve percent of the annual streams to the major River Indus. The Kabul basin covers a total area of around 92,650 km2. The Salang, Panjshir, Nerkh, Maidan, Duranie, Kunar, Swat, Jindi, Barra, and Kalpani Rivers are its principal tributaries. On the basis of flow generation, the Kabul basin may be split into three major sub-basins: upper Kabul, Panjshir, and lower Kabul (Report, 2022). Panjshir generates nearly 15% of the annual flow, while the lower parts of the Kabul River, including Chitral, Swat, Jindi, and Barra tributaries, generate the rest. The upper Kabul basin generates 2.6 percent of the average annual flow of the basin because this part of the basin receives less rainfall and has no snowmelt contribution in its annual flow (Aziz, Rainfall-Runoff Modeling of the Trans-Boundary Kabul River, 2014). The average monthly temperature in the watershed reaches its highest point in July, when snow and glacier melt play a significant role in river flows. Throughout the year, the mean monthly precipitation reaches two peaks: in April and August. The Indian summer monsoon is primarily responsible for the peak precipitation in August, which is mostly felt in the Chitral, Swat, and extreme lower portions of the Kabul River (Ahmad S. , 2010). Western disturbances (WDs) that originate in the Mediterranean Sea have the greatest impact on the upper Kabul and Panjshir basins, with peak precipitation in April. Snow and glacier melt are also present in the Chitral and Swat basins. Major floods occur along the Kabul River as a result of these causes, particularly in low-lying regions in the lower Kabul basin (Aziz K. , 2013).

Figure 1. Importance of Water Security



***Source**: Florence Lozet and Kim Edou, "Water and Environment Security for Conflict Prevention in Times of Climate Change" (paper, Global Water Institute, Columbus, 2013), http://bit.ly/2GiVDMo.*

Control of important watercourses can become a source of conflict and/or water rivalry. Actors in charge of major watercourses may find themselves in a difficult position to influence the result. It is especially pertinent in the context of South Asia. The area, which houses 21% of the world's population but just 8.3% of the world's freshwater, is water-stressed. Water stress is being caused by a growing population, increased urbanization, shifting economies, changing agricultural patterns, global warming, rising sea levels, and water mismanagement in the South Asian region (Chapman, 2017). Pakistan takes conventional security issues more seriously, as evidenced by the narrative spread by statesmen, the media, political leaders, and security specialists, among others. The water dispute between Pakistan and Afghanistan, on the other hand, has not yet been designated as a serious security threat. The main issue for good relations between Pakistan and Afghanistan is Indian factor because India, like other international players, is actively involved in Afghanistan's economic rehabilitation. Given Pakistan's historically strained ties with India, any development initiative in Afghanistan bearing an Indian "signature" is viewed as a security concern and a mobilization of the Indian area of strategic influence in Pakistan.

Trans-boundary water issues under International Law

The world structure is depend on states connections and relations in different level because no one state can live alone but must be depend on other states to fulfil their basic needs. So in this connection the world 145 states are connected around 276 transboundary watersheds. In this connection, water is a basic need for living, and without proper management of water, it is difficult for any state to survive. The important thing in international relations is national interest because states define and design their foreign policy according to their national interest. So the utmost important national interest of any state in international relations is her autonomy and security. When water cross the border of another states we called it trans-boundary water and for fulfilling water desires both states need agreements and treaties, which will lead by international Law. Water play an important role for socio-economic development of countries but it can also be used to destruct states economies. To avoid such conflicts between states over transboundary water, the international legal framework plays an important role in bringing cooperation among states over water issues (Nation, 2013).

The international law help to provide rules for transboundary water management and cooperation between states. But if there is no any agreement between states over water, then customary international law can guide and facilitate states over multilateral and bilateral waters. According to customary international

law upper riparian cannot stop water flow towards lower riparian and also cannot effect the quality and quantity of flowing water towards lower riparian (Azam, 2015). The customary law that can assist the two governments establish an agreement on water is the 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses10, which handles shared water resources. Its key principles on watercourses, such as 'equitable and reasonable use' (Articles 5 and 6) and 'the obligation not to cause significant harm' (Articles 7), the obligation to share data (Articles 9), 'information concerning planned measures' (Articles 11) and their potential adverse effects (Articles 12), and the protection and preservation of ecosystems (Part IV; Articles 20–23), can serve as a guide for co-riparians. In addition to the two conventions mentioned above, the Madrid Declaration (1911), Helsinki Rules (1966), and Berlin Rules (2004) are legal frameworks with the guiding principles of participatory water management, protection of existing uses, sustainable water development, minimising hazards, equitable utilization, aquatic environment protection, and discouraging alterations and modifications in international basins.

There are several success stories of transboundary water cooperation and management across the world. There are lessons to be learned from these examples. The Columbia River Treaty (CRT) between Canada and the United States, which was signed in 1964, is an example. On the Colombia River, Canada has both upper and lower riparian areas. Canada agreed to have storage facilities as part of the CRT, and the United States was given permission to build the Libby dam. However, the dam resulted in a backflow of water into Canada. Both nations continue to share the power generated by the dams permitted under the CRT and work together to avert floods.

Another success story is the collaboration of nine co-riparians on the Rhine River to coordinate efforts on security problems such as water quality, ecology, fisheries protection, and floods. Another example is the 1929 treaty between Egypt and Sudan on the Nile River Basin, one of the world's most delicate and fragile basins (Chen, 1960). Many experts consider the Indus Waters Treaty (IWT) between India and Pakistan to be a success story for the South Asian area (Malik, 2019). There are few takeaways from this legal agreement on shared waterways between the two ordinarily bitter rivals:

To avoid unfavorable outcomes, and efficient dispute settlement process amongst co-riparian nations is required. Power imbalances between the treaty's parties may jeopardise the treaty's spirit, resulting in hydro hegemony and a delay in conflict resolution. Positive and active third-party engagement is critical for reaching a settlement, which was achieved in this case through active World Bank support. The parties' sensitivity to hydrological considerations, i.e. securitizing the water problem, might help speed up an agreement. It is necessary to separate water from other irritants. Joint water institutions have the potential to be useful in dispute resolution.

Pakistan's Concerns and Water Strategy

Pakistan is not prepared for any crisis since it is water-stressed and has developing internal water problems. Its irrigation system is inefficient, with yearly escapade below Kotri of 32 MAF (WAPDA, 2012). It implies that a significant proportion of water in the system is squandered. Pakistan was unable to construct any storage facilities after 1973, although this was made feasible by World Bank-funded substitute arrangements. Under the IWT, the country has fully lost its share of eastern rivers, and Indian hydropower projects are also threatening non-exclusive water rights on western rivers.

Any initiative by Afghanistan will restrict the flow in the western rivers, perhaps worsening the interprovincial split over water and a slew of other concerns. Terrorism and anti-terrorist operations have caused dislocations and displacements in KP province. Conflicts have erupted between Parachinar's Shia and Sunni populations over the use of community-built water canals since the 1940s. Any water scarcity may be used to spark a sectarian crisis in the region, which would likely extend across the country. India's involvement in Afghanistan is making the issue

more complicated because since 2001, they have allocated two billion dollars to different developmental projects in Afghanistan (Nafees, 2015). So Afghanistan has previously benefited from India's assistance in the construction of the Salma dam in Herat Province, dubbed the Afghan–India Friendship Dam. The dam has sparked discontent in Iran's downstream region. On the Kabul River, India has planned the Shahtoot dam in Chahar Asiab district. Overall, it has aided Afghanistan in the preparation of feasibility studies and reports for 12 hydropower projects on the Kabul River (Noreen, 2015).

Pakistan is concerned about the proposed Afghan hydro projects because they may jeopardise Pakistan's water rights and, as a result, its water security. The issue is that these facilities will enable Afghanistan to regulate water flows in Pakistan, restricting flows during dry periods and releasing them during wet periods. Controlling and releasing water from Afghanistan has the potential to alter crop patterns as well as sowing and cultivating periods. The ecological implications of these initiatives are of regional significance, not just for fisherman communities, but also for fish stocks, animals, and migrating birds on both sides of the border.

Afghanistan's Concerns and Development Strategy

It is impossible to deny that any concerns about its shared waterways in Afghanistan are genuine. Water shortages have already resulted in environmental devastation, Internally Displaced Persons (IDPs), and the loss of millions of people's livelihoods. The environmental theory for Afghanistan's political turmoil during the 1970s would explain why the Ghilzai and Durrani tribes were marginalised as a result of frequent droughts in the country (Aziz K. , 2013). It endangered their principal source of income, cattle, and consequently their livelihood, resulting to a 1978 coup against Sardar Daud and subsequent backing for the Taliban. Afghanistan is still suffering from severe dislocation as a result of reduced rainfall and drought conditions, as well as diminished karez water, which has resulted in a 60% drop in cultivable area (Ahmad, 2020).

Afghanistan's agriculture industry accounts for about half of the country's GDP. In agriculture, it has enormous promise. Afghanistan was self-sufficient in agriculture production and exporting its agricultural goods before to the Soviet invasion. 12.7 million acres of the country's 19 million acres are arable. The entire cultivable area was 10.8 million acres before the Soviet invasion, but this was reduced to 7.7 million acres after the war since much of the irrigation infrastructure was destroyed. Due to drought and the Taliban government's failure to reconstruct the irrigation system, the amount was decreased to 4.6 million acres in 2002 (Aziz, Need for a Pak-Afghan Treaty on Management of Joint Watercourses., 2017). During the US occupation and following political regimes, there was no major improvement in the water infrastructure. In Afghanistan, there is apprehension about sharing water with its neighbors. The Afghan governments have stated that their neighbors' are causing damage to their water development projects and are utilizing more of their resources (Mashal M. , 2012) Afghanistan and Iran have a treaty on the Helmand River Basin, and Afghanistan argues that Iran is utilizing significantly more water than it is supposed to. Because of the problems with the Helmand Deal, Afghan officials are leery of signing a new treaty on the Kabul River (Mashal, 2012).

Now that the political situation in post-conflict Afghanistan is settling down and refugees and IDPs are anticipated to come home, there is additional pressure and need for more water. Because most of Afghanistan's irrigation infrastructure has been destroyed by the conflict, the government has opted to repair it and make use of the country's water resources (Campbel, 2015). All of these projects in upstream Afghanistan are seen to be vital since the nation lacks reservoirs, dams, and water infrastructure to manage its run-off and control water flows to its neighbours. Afghanistan aims to build 12 huge multi-purpose dams on the Kabul River, as well as many more projects on other rivers, with the help of foreign funders. The dams on the Kabul River will have a storage capacity of 4.7 MAF, about comparable to Pakistan's Mangla Dam. Pakistan's water demands may be jeopardised

as a result of the 16-17 percent reduction in downstream flow (Zulfiqa, 2017).

Challenges for settlement

Both Pakistan and Afghanistan have attempted to talk in the past is try to come up with a system. In 2006, the World Bank offered its services as a facilitator and mediator to both nations for a cooperative water pact on the Kabul River. It, on the other hand, declined to be the guarantor. The World Bank's efforts were unsuccessful in bringing the two sides to a bargaining table. Afghanistan used the excuse that it was still working on its National Water Policy and couldn't start negotiations until it was finished (Khan, 2021). In 2003 and 2005, the Pakistani government established expert committees on water resources to better analyze and define the country's water policy, as well as to negotiate an agreement with Afghanistan on the Kabul River. These committees were unable to make progress due to a lack of data on the Afghan side and Afghanistan's unwillingness to disclose information on flows. Water and electricity were cited as significant problems in the joint statement issued by the two governments during the third Regional Economic Cooperation Conference on Afghanistan in 2009. However, the 'Islamabad Declaration,' and unified declaration, was unable to encourage collaboration (Macbeth, 2018).

The 'Pakistan Trans-border Water Organization' was founded in 2011 to address difficulties relating to water sector projects started by upper riparian India and Afghanistan. The two countries pledged in 2013 to establish a bilateral deal on the Kabul River, but the treaty has yet to be signed (Zulfiqar, 2020). The World Bank invited representatives from Pakistan's and Afghanistan's foreign ministries to Dubai in 2014 to address the problem of shared waterways. Afghanistan presented their proposal at the conference, however the follow-up meeting was cancelled. The officials of the two governments addressed the building of the Saggy and Shaal dams on the Kabul River, as well as data sharing processes and first water allotment (Zulfiqar, 2020). The water legislation of 2011 established a legislative framework for water management in Afghanistan, declaring commitment to the spirit of the international standards of transboundary water sharing (Macbeth, 2018).

The government, on the other hand, has devised a complex system for regulating transboundary Rivers that necessitates collaboration between four ministries. The Ministry of Energy and Water (MEW) is responsible for transboundary water conflicts, although it is supported by the Ministries of Interior Affairs (MOIA), Foreign Affairs (MOFA), and Borders, Nations, and Tribal Affairs. These departments help the MEW develop Memorandums of Understanding (MOUs) and treaties. The presence of so many interests might stymie the process of obtaining a water pact. However, the 2015 revision to the water legislation, which aims for a unified water policy, is a significant start in the right direction. Both countries are already collaborating on flood prevention and control. The representative of Afghan MEW addressed ideas on Glacial Lake Outburst Flood at a seminar held by the Pakistan Ministry of Climate Change and the United Nations Development Program (UNDP) in October 2015.

Conclusion

The risk of a future confrontation between Pakistan and Afghanistan over shared water cannot be avoided after reviewing security attitudes in Pakistan and Afghanistan. Instead of splitting waters or making unilateral choices, an integrated method based on the core idea of benefit-sharing is required. It is suggested that the two riparians undertake a benefit-sharing strategy. A positive-sum game between the two neighbours will result from such an approach. The cost and benefit-sharing strategy is examined in terms of both real and intangible costs and benefits. The measurable cost covers the whole financial cost of infrastructure building and operation, land acquisition costs, and rehabilitation of impacted populations (Mahmood, 2018). The social and psychological costs of displaced communities, the loss of agricultural land drowned by reservoirs, and the ecological costs are among the intangible costs. More regular hydrological flows, hydropower generation, greater output, and drought and flood control will be real advantages. Peace dividends,

decreased military spending, and domino effects on the environment and wellbeing of communities tied to water and other socio-economic sectors will be among the intangible advantages (Khalid, 2018). To get the most out of the idea of benefit sharing, there must be an equal distribution of benefits based on public estimates of benefits and costs, as well as political will on both sides. In the burgeoning hydropolitics of Pakistan and Afghanistan, a bilateral water treaty would be a positive step forward and a confidence-building move toward bettering ties. The following are some policy ideas for achieving a bilateral water deal on the River Kabul and its tributaries: Consultation of worldwide best legal practices for successful water management and conflict avoidance; Trust-based political resolve and preventative hydro diplomacy; Raising awareness of the issue among leaders and the general public; Establishment of ministerial and technical consultative committees, with national experts on both sides and international experts and funders; the IWT's conflict resolution process offers a solid foundation (Zulfiqar, 2020). The current 'no treaty' scenario on shared waterways is not going to help; the water commissioners may be entrusted with negotiating a cooperative agreement for the treaty, fostering collaboration, environmental impact assessment, and 'optimum river development.' Putting in place regulatory, reporting, and monitoring mechanisms, as well as annual/periodic reviews; Delinking water from other political and security issues to avoid a deadlock; Given the less cordial bilateral ties between the two parties, other interlocutors such as the Asian Development Bank and the World Bank, as well as a common neighbour such as China, can assist in reaching a treaty agreement. Prior to the formation of a treaty between Pakistan and Afghanistan, establishing a prompt and transparent interchange of data on the Kabul River and the additional water required for the planned new projects. Data sharing on a fortnightly basis and the installation of Telemetry Systems will ensure transparency and will be confidence-building measures leading to the next step forward, i.e. a treaty regime; cooperation and joint water monitoring on ensuring the quality to prevent the water bodies from becoming polluted; Afghanistan needs to assure Pakistan that all the projects it plans to initiate are purely development-related and for its legitimate right to meet its needs; Afghanistan needs to assure Pakistan that all the projects it plans to initiate are purely development- It must guarantee that these infrastructures are regulated in accordance with the idea of benefit sharing.

References

Ahmad. (2020, December 2,). *Towards Kabul Water Treaty: Water Cooperation for Managing Shared Water Resources: Policy Issues and Options*. Time, 9-12.

Ahmad, S. (2010). *Towards Kabul Water Treaty: Managing Shared Water. Karachi*: IUCN Pakistan.

Ahmar, D. M. (2021, May 23). *How to Manage Water Conflicts in Pakistan*? The Express TRIBUNE , 10-11.

Awan, M. H. (2018, July 09). *A Pak-Afghan water treaty?* THE NEWS, 10-12.

Azam, S. (2015). Kabul River Treaty: A Necessity for Peace-n-Security between Afghanistan and Pakistan, and Peace in South Asia. *Gomal University Journal of Research*, 134-145.

Aziz. (2014). Rainfall-Runoff Modeling of the Trans-Boundary Kabul River. *Pakistan Journal of Meteorology, 10*(20), 75-80. http://www.pmd.gov.pk/rnd/rndweb/rnd_new/journal/vol10_issue20_files/7.pdf

Aziz. (2017, June 10). *Need for a Pak-Afghan Treaty on Management of Joint Watercourses*. The News, 12-12.

Aziz, K. (2013, July Monday). *Need for a Pak-Afghan Treaty on Management of Joint Watercourses*. Criterion Quarterly,. 10-14.

Campbell, J. (2015) A dry and ravaged land: investigating water resources in Afghanistan. *Earth Mag 60*(1–2), 48–55.

Chapman, J. (2017). *Conflict and Climate Exacerbate South Asia's Water Crisis. Pacific Council on International Policy*, 45-74.

Chen. (1960). *Indus Waters Treaty 1960, India-Pak.-IBRD*. UNITS, 419-423.

Ebrahim, Z. T. (2019, February 10). *With Kabul River flows controversy*. The News, 10-11.

Khalid, B. (2018). *Benefit of Sharing on Kabul River Basin: Afghanistan-Pakistan Stakeholders . Islamabad*: Leadership for Environment and Development (LEAD) Pakistan.

Khan, S., & Pervaz, I. (2014). Brewing Conflict over Kabul River: Policy Options for Legal Framework.". *The Journal of Governance and Public Policy, 6*(2) 17-38.

Macbeth, H. a. (2018, November 2). O*rphan River: Water Management of the Kabul River Basin in Afghanistan and Pakistan*. Diplomate, 7-9.

Mahmood. (2018). *Prospects for Benefit Sharing in the Trans-Boundary Kabul River Basin: Investigating the Social, Economic and Political Opportunities and Constraints. policy perspective*, 23-18.

Malik, T. (2019). Pak-Afghan water issue A case for benefit- sharing. *Policy Perspective, 16*(1)1-22. https://www.scienceopen.com/hosted-document?doi=10.13169/polipers.16.1.0077

Mashal. (2012, December 2). "*What Iran and Pakistan Want from the Afghans*: *Water*. Time, 11-14.

Nafees, M., & Khan, S. A. (2015). Construction of Dams on Kabul River and its Socio-Economic Implications for Khyber Pakhtunkhwa, Pakistan. *Journal of Criminology, 83*(1), 16-20.

Nation, U. (2013). *Water Security and the Global Water Agenda*. Ontario: University, Ontario.

Noreen, N. (2015). Federally Administered Tribal Areas (FATA): Impacts of Militarization and War Crimes on Tribal Women and Children. *Pakistan Journal of Criminology, 7*(4), 129-139.

Report, B. (2022, March 22). *Kabul River water: Dialogue calls for following international law*. The News, 6-8.

Salman, S. M. (2006). International Water Disputes: A New Breed of Claims, Claimants, and Settlement Institutions. *International Water Resources Association*, 2-11.

Sayal, E. A., & Bukhari, M. (2011). Emerging Climate Changes and Water Resource Situation in Pakistan,. *Pakistan Vision, 12*(2), 236-254.

WAPDA. (2012). *Hydro Potential in Pakistan. Lahore, Pakistan: Pakistan Water and Power Development Authority.*

Zulfiqa, R. U. (2017). *Transboundary Water Issues between Pakistan andAfghanistan*. XVI Biennial IASC Conference 10-14. Utrecht: https://www.iasc2017.org/wp-content/uploads/2017/07/131_Raza-Ullah.pdf.

Zulfiqar. (2020, December 8). *Transboundary Water Issues between Pakistan and Afghanistan*. The News, 8-9.

Stanford, B. D., Wright, B., Routt, J. C., Debroux J. F., & Khan S. J. (2014). *Water Quality Impacts of Extreme Weather-Related Events. Water Research Foundation; Denver, CO, USA*: Water Services Association of Australia; Melbourne, Australia:

Pollner J., Kryspin-Watson, J., Nieuwejaar, S.,.. (2011). *Disaster Risk Management and Climate Change Adaptation in Europe and Central Asia. Global Facility for Disaster Reduction and Recovery; Washington, DC, USA: The World Bank; Washington, DC, USA: Fang C.M., Chhetri N. What have we learned about climate variability and human health?* Clim. Vulnerability. Underst. Addressing Threat. Essent. Resour. 2013; 1: 79–86.

Global Facility for Disaster Reduction and Recovery. (2011).*Building Resilience to Disasters—Delivering Results, Global Facility for Disaster Reduction and Recovery Annual* Report 2011. Global Facility for Disaster Reduction and Recovery; Washington, DC, USA:

McMichael, A. J., Woodruff, R. E., & Hales, S. (2006). Climate change and human health: present and future risks. *The Lancet*, *367*(9513), 859–869. https://doi.org/10.1016/s0140-6736(06)68079-3

Ciesielczuk, T., Kusza, G., Poluszyńska, J., & Kochanowska, K. (2014). Pollution of Flooded Arable Soils with Heavy Metals and Polycyclic Aromatic Hydrocarbons (PAHs). *Water, Air, & Soil Pollution*, *225*(10). https://doi.org/10.1007/s11270-014-2145-0

Apisarnthanarak, A., Mundy, L. M., Khawcharoenporn, T., & Mayhall, C. G. (2013). Hospital Infection Prevention and Control Issues Relevant to Extensive Floods. *Infection Control & Hospital Epidemiology*, *34*(2), 200–206. https://doi.org/10.1086/669094

Ni, W., Ding, G., Li, Y., Li, H., Liu, Q., & Jiang, B. (2014). Effects of the floods on dysentery in north central region of Henan Province, China from 2004 to 2009. *Journal of Infection*, *69*(5), 430–439. https://doi.org/10.1016/j.jinf.2014.05.016

World Health Organization. (2006). *Working Together for Health, the World Health Report*. World Health Organization; Geneva, Switzerland.

Ivers, L. C., & Ryan, E. T. (2006). Infectious diseases of severe weather-related and flood-related natural disasters. *Current Opinion in Infectious Diseases*, *19*(5), 408–414. https://doi.org/10.1097/01.qco.0000244044.85393.9e

Greenough, G., McGeehin, M., Bernard, S. M., Trtanj, J., Riad, J., & Engelberg, D. (2001). The Potential Impacts of Climate Variability and Change on Health Impacts of Extreme Weather Events in the United States. *Environmental Health Perspectives*, *109*, 191. https://doi.org/10.2307/3435009