

POLITICAL DIMENSION OF WATER PAUCITY IN PAKISTAN

*Dr. Waseem Ahmad Qureshi**

ABSTRACT

Amid global water scarcity, this Article aims to discover the key factors that contribute to water paucity in Pakistan; accordingly, the surge in population and the decrease in the water flows from the upper riparian will be explored in detail. This Article contends that retaining freshwater reservoirs by corporations, most notably by the upper riparian states, is a strategical maneuver to control future economic perspectives, and, furthermore, to use the management of water flow as a persuasive tool in political and economic regional politics during conflicts or wars.

“If wars of this century were fought over oil, the wars of next century will be fought over water—unless we change our approach to managing this precious and vital resource.”¹

— Ismail Serageldin, vice president of the World Bank in 1995.

I. INTRODUCTION

Among all natural resources, fresh water remains a necessary commodity in the world. Amid a surge in population and global economic progression, the depletion of water resources and the requirement for food have amplified exponentially.² As a result, water skirmishes tend to have devastating effects on regional economies and environments.³ These effects are because an escalation of water conflicts between upper and lower riparian states would not only

* Advocate Supreme Court of Pakistan.

¹ See ASSESSING THE FUTURE OF WATER (Jun. 24, 2013), <http://www.iiasa.ac.at/web/home/resources/mediacenter/FeatureArticles/Water-Meeting-Report.en.html>.

² MARK ROSEGRANT ET AL., WORLD WATER AND FOOD TO 2025: DEALING WITH SCARCITY 2 (2002).

³ *Id.*

destabilize regional peace but also place international security in danger in the form of wars.⁴ So, in the future, vast wastelands comprising entire continents are easily imaginable if water disputes are not placated and such conflicts are allowed to flourish. To address this issue, states bilaterally agree to certain conditions through treaties and to share water resources reasonably among themselves.⁵ Violating such a treaty is considered an act of war.⁶ Consequently, guardians of international peace and security, such as the United Nations, place sanctions and embargos on perpetrators in order to deter them from violating treaties and bilateral agreements; this acts to mediate water conflicts before they evolve into wars or threaten regional and global harmony.⁷ In this context, the Indus Waters Treaty of 1960 (“IWT”) between Pakistan and India—with the World Bank as a neutral participant—is a landmark treaty in terms of sharing water resources.⁸ The IWT has survived decades while enduring wars and clashes between hostile neighboring states.⁹ However, tensions between the two parties have developed over water resources, with regard to increased construction work by India in the headworks of the Indus Basin.¹⁰ Pakistan only suggests that, in accordance with the established treaty, India not disturb the natural flow of the western rivers, which were designated to Pakistan in the treaty, by constructing projects in the headworks; such works not only violate the provisions of the IWT, but also distress the general population by developing water scarcity and, possibly, famine in the whole country.¹¹

⁴ See generally Jerry Madner, *THE CAPITALISM PAPERS: FATAL FLOWS OF AN OBSOLETE SYSTEM* 114 (2012) (remarking “the next world war will be on waters”).

⁵ See Molly Espey & Basman Towfique, *International Bilateral Water Treaty Formation*, 40 *WATER RESOURCES RES.* (2004).

⁶ Francisco Forrest Martin, *The Constitution as Treaty: The International Legal Constructionalist Approach to the U.S. Constitution*, *CAMBRIDGE UNIV. PRESS* 140, 145-46 (2007).

⁷ Enzo Cannizzaro, *The European Union as an Actor in International Relations*, *KLUWER L. INT’L* 208 (2002).

⁸ BRUCE LANKFORD, *WATER SECURITY: PRINCIPLES, PERSPECTIVES, & PRACTICES* 26, 27 (2013).

⁹ Justin Rowlett, *Why India’s Water Dispute with Pakistan Matters* (Sept. 28, 2016), <http://www.bbc.com/news/world-asia-india-37483359>.

¹⁰ *Id.*

¹¹ Reetika Sharma et al., *INDIA AND THE DYNAMICS OF WORLD POLITICS* 1.114 (2011).

Pakistan further maintains that construction work over the headworks of the western rivers can be used to cause floods or droughts in Pakistan at will.¹² During regional conflicts, this acts as a pressurizing geopolitical tactic that can, inadvertently or even deliberately, devastate the economic and financial well-being of the very social fabrics of the state.¹³ On the other hand, India maintains that the construction of dams and hydroelectric power plants are crucial to cater to growing electricity needs; therefore, the treaty should be altered to respond to the current needs of the upper riparian state.¹⁴

The first Section of this Article will scrutinize *water security* and the *water crisis* in general, and the second Section will touch on *water scarcity* as a result of the decreased water flow from the upper riparian and the population surge in Pakistan.¹⁵ Finally, the third Section of this Article will briefly discuss the Indian construction projects in the headworks of the western rivers and how such construction works contribute towards water scarcity in Pakistan.¹⁶

II. UNDERSTANDING THE WATER CRISIS

The term “water wars” (a media slogan to refer to water crises) has been used strategically as a politically compelling instrument. Given the surge in population, global developments, and economic and natural needs for domestic and agrarian purposes, water is considered the key ingredient in life.¹⁷ While it is estimated that freshwater reservoirs of the world are sufficient for the world’s population, millions do not have

¹² Andrew Guzman, *OVERHEATED: THE HUMAN COST OF CLIMATE CHANGE* 159 (2013).

¹³ See generally Victoria Schofield, *KASHMIR IN CONFLICT: INDIA, PAKISTAN AND THE UNENDING WAR* (2010) (summarizing the conflict over Kashmir between Pakistan and India leading to the drought and economic hardship in the region).

¹⁴ See generally Justin Rowlatt, *Why India’s Water Dispute with Pakistan Matters* (Sept. 28, 2016), <http://www.bbc.com/news/world-asia-india-37483359> (understanding that India wants to modify or completely disregard bilaterally agreed IWT).

¹⁵ *Infra* Sections I and II.

¹⁶ *Infra* Section III.

¹⁷ *Managing Water Under Uncertainty and Risk*, THE UNITED NATIONS WORLD WATER DEV. REP. 5 (2012).

any direct access to fresh water.¹⁸ This is because upper riparian states enjoy excessive use and deliberately deprive the lower riparian states of the basic right to access water.¹⁹

This offense against nature presents cause for dispute where the lower riparian is insecure and seeks justice.²⁰ The dispute jeopardizes the region's stability and presents a threat to global peace and security.²¹ This water scarcity issue is not, in general, an issue of effective water control or management, in fact, about the politics of the region; as a result, it is mainly about the role of water as a tool of influence.²² This is because upper riparian states tend to first construct big water reservoirs of the shared waters solely to influence the lower riparian states, benefitting the upper riparian in economic terms while devastating regional peace and the natural ecosystem.²³

In the long run, ecologically, such unilateral management of waters will have an adverse effect on the lower riparian region.²⁴ For instance, floods in Pakistan have claimed thousands of lives, displaced millions of civilians, and instigated famines.²⁵ Bloodshed during the water wars between the tribes of Kenya is just one example of distressed water management.²⁶ To tackle water insecurity, the United Kingdom has put

¹⁸ *Facts About Water & Sanitation*, WATER.ORG, <http://water.org/water-crisis/water-sanitation-facts/> (last visited on March 31, 2017).

¹⁹ Bjorn-Oliver Magsig, *Overcoming State-Centrism in International Water Law: 'Regional Common Concern' as the Normative Foundation of Water Security*, 3 GOETTINGEN J. OF INT'L L. 325-26 (2011).

²⁰ *Id.* at 325.

²¹ *Id.* at 326.

²² BRAHMA CHELLANEY, *WATER, PEACE, & WAR: CONFRONTING THE GLOBAL WATER CRISIS* 245 (2013).

²³ Magsig, *supra* note 19, at 320-25.

²⁴ See Chellaney, *supra* note 22, at 181; see also Jack Ives, *Himalayan Perceptions*, HIMALAYAN J. OF SCIENCE 112 (2006); see also Bharat Verma, *Indian Defence Review*, LANCER PUB. 101 (2011).

²⁵ See Chandio, *infra* note 145; see also Neil Grigg, *Water Finance*, JOHN WILEY & SONS 108 (2011).

²⁶ Nash Colundalur, *Tribes in Kenya Wage Water War*, IN THESE TIMES (2010), http://inthesetimes.com/article/6335/tribes_in_kenya_wage_water_war.

water in its international development policy.²⁷ Similarly, a report on Peruvian asparagus calls on investors to invest in water resources to change the current dynamics of the “virtual waters” in the market.²⁸ The importance of water shortage cannot be overemphasized because United Nations World Water Assessment Programme has assessed that by the year 2030 more than half of the world’s population will be affected by water scarcity and will have no direct access to fresh water.²⁹ Keeping this assessment in mind, it is safe to say that global food production will decrease, despite an increase in food demand, because water is the key factor for high yields in crops.³⁰ This sudden decline in food production, despite the high growth rate in population, will create huge inevitable food crises in the near future, along with water shortages, conflicts, and wars.³¹ These water shortages will certainly be more acute in certain parts of Asia, most particularly in Pakistan, as its neighbor India is very keen to construct dams in order to keep freshwater reserves to itself,³² disregarding the bilateral treaty or the IWT.³³

To alleviate the water crisis, multinational companies, investors, and international organizations—for instance, the World Bank and the Food and Agriculture Organization of the United Nations—are pushing states and investors to invest in freshwater reservoirs and fertile lands.³⁴ This is very likely to deteriorate the water situation because corporate

²⁷ See *2010 to 2015 Government Policy: Water and Sanitation in Developing Countries*, DEPT. FOR INT’L DEV. (2013) <https://www.gov.uk/government/publications/2010-to-2015-government-policy-water-and-sanitation-in-developing-countries>.

²⁸ MARC EDELMAN, ET AL., *Global Land Grabs* 144 (2015).

²⁹ RICHARD KINGSFORD, *Ecology of Desert Rivers* 324 (2006).

³⁰ MARK ROSEGRANT ET AL., *WORLD WATER AND FOOD TO 2025: DEALING WITH SCARCITY* 7 (2002).

³¹ WWAP, *Water for People, Water for Life*, THE UNITED NATIONS WORLD WATER DEV. REP. 13, 18, 26 (2003).

³² See Dinesh Kumar, *Water Management in India*, GYAN PUB. 292 (2009) (explaining India’s race to increase its water storage capacity in per capita terms).

³³ See Gustaf Olsson, *Water and Energy*, IWA PUB. 17-18 (2012) (indicating that the “Court of Arbitration concluded that Kishanganga Dam construction violates IWT”).

³⁴ KARL P. SAUVANT, *Yearbook on International Investment Law & Policy 2009-2010* OXFORD 572 (2010).

investment in freshwater reservoirs will definitely entail an appropriation of fertile farmlands abroad for temporary economic expansion. It will also leave a negative impact on the exporting state or the host state by converting water into a “virtual commodity,” only attainable by the privileged population abroad, and consequently leaving less water for the general populace in the host state.³⁵ Further, the situation of occupying waters is happening quickly, mainly because developing nations are keen to acquire economic investment by focusing on mitigating their losses, while disregarding the prospects of losing fertile lands, disrupting the ecosystem, degrading the environment, and snatching natural resources from their citizens; as a consequence, and inadvertently, this creates further food and water crises in the host country.³⁶ Financiers are targeting those states with the feeblest regulations and least expensive land, yet the general population opposes such corporate deals.³⁷ For instance, the people of Madagascar revolted against their government in reaction to similar deals of domestic natural reservoirs with the foreign organizations.³⁸

Subsequently, global corporate elites like Coca-Cola, Nestle, Lloyd’s, and McKinsey are suddenly more interested in supervising world freshwater resources.³⁹ The reasons for this can only be either because they are victims of water conflicts or crises (which they are not) or because they are keen to acquire patents and rights over freshwater reservoirs and ice glaciers, so that at times of droughts in the near future they can supply fresh water to the affected regions because they see this as an economic opportunity to generate unparalleled profits.⁴⁰

Because water has affected multidimensional, international, foreign

³⁵ See ARJEN HOEKSTRA ET AL., *GLOBALIZATION OF WATER* (2011).

³⁶ Ayesha Siddiqi, *Kashmir and the Politics of Water* (Aug. 11, 2011), <http://www.aljazeera.com/indepth/spotlight/kashmirtheforgottenconflict/2011/07/20117812154478992.html>.

³⁷ Bjorn-Oliver Magsig, *Overcoming State-Centrism in International Water Law: ‘Regional Common Concern’ as the Normative Foundation of Water Security*, 3 *GOETTINGEN J. OF INT’L L.* 320-25 (2011).

³⁸ GEORGE SCHONEVELD, *GOVERNING LARGE-SCALE FARMLAND INVESTMENT IN THE SUB-SAHARAN AFRICA: CHALLENGES AND WAYS FORWARD 2* (2014).

³⁹ See Magsig, *supra* note 38, at 324-25.

⁴⁰ *Id.* at 325-26.

and national policies amid water crises, it has come to take primary importance in national security and national policy.⁴¹ For example, there have been water skirmishes between Pakistan and India, where Kashmir has become a flashpoint problem, and both states have been fighting to take control of the headworks of freshwater sources for more than half a century.⁴² These headworks are sources of fresh water for billions of people, so it is safe to conclude that governments will try to take control of as many headworks as possible.⁴³ However, a bilateral treaty places binding legal obligations on both countries.⁴⁴ This will be briefly discussed later in this Article.⁴⁵

Amid these tensions in regional water security, scholars remarked that strong states will try to pulverize weak states and will disproportionately distribute waters—not only by taking advantage of being upper riparian states but also by trying to encapsulate as many freshwater reservoirs as they can—this theory is termed “hydro-hegemony.”⁴⁶

III. WATER SCARCITY IN PAKISTAN

To indicate water stress in Pakistan, the Asian Development Bank has noted that, along with other hot, water-stressed regions of Asia, Pakistan has one of the scarcest water supplies, with the lowest per capita water availability in the world.⁴⁷

⁴¹ See *2010 to 2015 Government Policy: Water and Sanitation in Developing Countries*, DEPT. FOR INT’L DEV. (2013) <https://www.gov.uk/government/publications/2010-to-2015-government-policy-water-and-sanitation-in-developing-countries>.

⁴² Robert Wirsing et al., *International Conflicts Over Water Resources in Himalayan Asia*, PALGRAVE MACMILLAN 91 (2012).

⁴³ Ayesha Siddiqi, *Kashmir and the Politics of Water* (Aug. 11, 2011), <http://www.aljazeera.com/indepth/spotlight/kashmirtheforgottenconflict/2011/07/20117812154478992.html>.

⁴⁴ *Id.*

⁴⁵ See *infra* note 112.

⁴⁶ Anton Earle et al., *Transboundary Water Management*, EARTHSCAN 34 (2013).

⁴⁷ *Asian Water Development Outlook 2016: Strengthening Water Security in Asia and the Pacific*, ASIAN DEV. BANK 9 (2016).

Besides population growth and water stress in per capita terms—that is, for domestic purposes, which comprise only five percent of all of Pakistan water needs—it is pertinent to note here that water is additionally stressed in that Pakistan is a major global food exporter and ninety-four percent of all water usage in Pakistan is for agrarian purposes, and further owing to decreased water supplies from the upper riparian region.⁴⁸ Consequently, water scarcity in Pakistan will not only contribute to environmental degradation, worsening health, decreased power production, and food crises; it will also instigate food crises across the globe.

In order to better understand this nexus of water scarcity and Pakistan's economy, and of water scarcity in Pakistan and food crisis abroad, it is pertinent to explain Pakistan as an agrarian economy in the footings of agriculture, exports, and Gross Domestic Product (“GDP”), and to explain the term “virtual water,” with its prominence amid the water crisis and the food crisis.

Additionally, it is interesting to note that while the increase in population will decrease per capita water supply, the most tangible water scarcity in Pakistan is in the farmlands for food production purposes, where its agrarian economy is based on food exports. This scarcity is mainly due to decreased water supplies from upper riparian regions, which reinstates the contention that decreased water supply is the predominant factor in water scarcity in Pakistan.⁴⁹

Therefore, this Section will provide essential details of water scarcity in Pakistan. The following subsections will discuss the three basic factors that contribute to water scarcity in Pakistan.⁵⁰ The first subsection will demonstrate that because Pakistan is an agrarian economy and a major food exporter, water as a commodity, i.e., “virtual

⁴⁸ *Irrigation in Southern and Eastern Asia in Figures, AQUASTAT Survey*, 7 (2011), http://www.fao.org/nr/water/aquastat/countries_regions/pak/PAK-CP_eng.pdf; see also Munir Ozturk et al., *Plants, Pollutants and Remediation*, SPRINGER 113 (2016).

⁴⁹ Aziz Ur Rahman and Zahid Mahmood, *Indian Water Hegemony; Hinge on Pakistan-India Relations*, 53 JRSP 147 (2016), http://pu.edu.pk/images/journal/history/PDF-FILES/11-Paper_53_2_16.pdf.

⁵⁰ See *infra* Sections II.

water,” is the major factor in water scarcity.⁵¹ Consequently, water scarcity can not only instigate food crises in Pakistan, but also have an effect in the distant regions of the world.⁵² The second subsection will briefly explain the effects of population growth on fresh water availability in per capita terms.⁵³ The third subsection will discuss the details of water requirements for the farmland in Pakistan, which are not met due to the deficiency in water supplies from the upper riparian region and its effects on the sectors of power production and health.⁵⁴

A. Understanding the Nexus of the Agrarian Economy and Water Scarcity

Pakistan is an agrarian economy and agriculture is the second largest economic sector, contributing twenty-four percent to GDP. Agriculture is the largest source of foreign currency in Pakistan, and the largest employment sector, employing half of the total labor force of the country.⁵⁵

The Pakistan Bureau of Statistics has estimated that 22.07 million hectares of land are cultivated in Pakistan, which has decreased substantially over the past two years, owing to decreased water availability.⁵⁶ While most land is irrigated with canal waters, a very small portion of farmland is dependent on rain waters; it is estimated that the ratio of canal-irrigated land to rain-irrigated land is the highest in the world, meaning that the economy of Pakistan is utterly dependent on river waters.⁵⁷ This is mainly because thirty-eight percent of all land in Pakistan is arable.⁵⁸ However, in recent times, substantial farmland

⁵¹ See *infra* Sections II.

⁵² See Rahman, *supra* note 49.

⁵³ See *infra* Section II.

⁵⁴ See *infra* Section II.

⁵⁵ See generally *Agriculture Statistics*, PAKISTAN BUREAU OF STATISTICS, <http://www.pbs.gov.pk/content/agriculture-statistics> (last visited Jan. 20, 2017).

⁵⁶ *Land Utilization Statistics*, PAKISTAN BUREAU OF STATISTICS, http://www.pbs.gov.pk/sites/default/files//tables/table%203%20land_utilization_statistics.pdf (last visited Jan. 20, 2017).

⁵⁷ See Rahman, *supra* note 49.

⁵⁸ *Land Utilization Statistics*, PAKISTAN BUREAU OF STATISTICS, http://www.pbs.gov.pk/sites/default/files//tables/table%203%20land_utilization_statist

has been affected by decreased water flows in the canals.⁵⁹ As a result, farmers rely heavily on groundwater for irrigation.⁶⁰ An estimated ninety-four percent of Pakistani water is used for irrigation purposes, and thirty-four percent of irrigation waters is groundwater.⁶¹ This substantial use of groundwater increases soil salinity and consequently harms agricultural yields and Pakistan's GDP.⁶²

Furthermore, the Food and Agriculture Organization of the United Nations noted that Pakistan "is among the world's top ten producers of wheat, cotton, sugarcane, mango, dates, and kinnow oranges, and holds thirteenth position in rice production. Major crops (wheat, rice, cotton, and sugar cane) contribute 6.5 percent, while minor crops contribute 2.3 percent of the country's GDP."⁶³ Within its reports, the Food and Agriculture Organization of the United Nations expanded on Pakistan's position in the food industry and noted that Pakistan is the eighth largest wheat producer in the world and the fourth largest milk producer in the world.⁶⁴ It is further calculated by the US Department of Agriculture that Pakistan exported 900,000 metric tons of wheat in the year 2016.⁶⁵ Similarly, Pakistan's beef and veal exports for the year 2016 were 85,000 metric tons CWE (Carcass-Weight Equivalent).⁶⁶ Likewise,

ics.pdf (last visited Jan. 20, 2017).

⁵⁹ See Rahman, *supra* note 49.

⁶⁰ *Irrigation in Southern and Eastern Asia in Figures, AQUASTAT Survey*, 15 (2011), http://www.fao.org/nr/water/aquastat/countries_regions/pak/PAK-CP_eng.pdf.

⁶¹ *Id.* at 7, 9; Mehmood Ul Hassan & Prachanda Pradhan, *Coordinated Services for Irrigated Agriculture in Pakistan*, PROCEEDINGS FOR THE NATIONAL WORKSHOP 34 (1998), <http://publications.iwmi.org/pdf/H030081MainDoc.pdf>.

⁶² See Rahman, *supra* note 49; *Irrigation in Southern and Eastern Asia in Figures, AQUASTAT Survey*, 15 (2011), http://www.fao.org/nr/water/aquastat/countries_regions/pak/PAK-CP_eng.pdf.

⁶³ *Pakistan*, FOOD & AGRICULTURAL ORG. OF THE UNITED NATIONS, <http://www.fao.org/pakistan/fao-in-pakistan/pakistan-at-a-glance/en/> (last visited Jan. 20, 2017).

⁶⁴ *Pakistan and FAO Achievements and Success Stories*, FAO REPRESENTATION IN PAKISTAN 2-3 (2011), <http://www.fao.org/3/a-at014e.pdf>.

⁶⁵ *Pakistan Wheat Exports by Year*, U.S. DEP. OF AGRIC., <http://www.indexmundi.com/agriculture/?country=pk&commodity=wheat&graph=exports> (last visited Jan. 20, 2017).

⁶⁶ *Pakistan Beef and Veal Meat Exports by Year*, U.S. DEP. OF AGRIC., <http://www.indexmundi.com/agriculture/?country=pk&commodity=beef-and-veal->

Pakistan's milled rice exports were 4,200,000 metric tons for the year 2016.⁶⁷ The list of exports by Pakistan is reasonably extensive and can be accessed at the Index Mundi website.⁶⁸ This shows that Pakistan is a major food supplier.

Accordingly, to understand the relation of Pakistan food exports to water scarcity, it is essential to comprehend principalities of “virtual water.”⁶⁹ In 2002, Hoekstra and Hung presented and elucidated a scholarly understanding, which Professor J. A. Alan pioneered in the 1990s, that through food trade and exports, water becomes a commodity that is exchanged between states because the food that is exchanged requires a substantial and definite amount of water to grow and produce.⁷⁰ In this context of “virtual water,” academics and scholars have estimated that growing one kilogram of beef uses 14,000 liters of water.⁷¹ Similarly, the production of one kilogram of rice requires 3,400 liters of water, and one liter of milk requires 1,000 liters of water.⁷² It is interesting to note that meat and cattle production processes in general, require more water than vegetable or fruit production processes because in such calculations—in addition to water consumed by the animals—water needed to grow the animals' feed is included. Moreover, going higher in the food chain to calculate virtual water requirements can further increase such estimates.⁷³

Because Pakistan uses ninety-four percent of its water consumption

meat&graph=exports (last visited Jan. 20, 2017).

⁶⁷ *Pakistan Milled Rice Meat Exports by Year*, U.S. DEP. OF AGRIC., <http://www.indexmundi.com/agriculture/?country=pk&commodity=milled-rice&graph=exports> (last visited Jan. 20, 2017).

⁶⁸ *Pakistan Exports*, U.S. DEP. OF AGRIC., <http://www.indexmundi.com/agriculture/?country=pk&graph=production> (last visited Jan. 20, 2017).

⁶⁹ See generally A.Y. Hoekstra & P.Q. Hung, *Virtual Water Trade*, IHE-DELFT (2002) <http://waterfootprint.org/media/downloads/report11.pdf> (discussing principles of virtual water).

⁷⁰ *Id.*

⁷¹ MARKUS AUFLEGER, *HANDSHAKE ACROSS THE JORDAN: WATER AND UNDERSTANDING* 39 (2011).

⁷² VALERIA BELVEDERE ET AL., *SUSTAINABLE OPERATIONS AND SUPPLY CHAIN MANAGEMENT* 6 (2017).

⁷³ See Aufleger, *supra* note 71, at 39.

for agrarian purposes, it is safe to say that the major part of Pakistan's waters is traded as a commodity in the form of virtual water, where most water is consumed to make the products that are exported.⁷⁴ So, in essence, water plays a key role in Pakistan's economy since it is a major requisite to produce food, and in turn, the key factor in water scarcity in the state.⁷⁵ Therefore, water scarcity in Pakistan can conceivably cause famine in the country and a food crisis around the globe.⁷⁶

B. Water Scarcity due to Decreased Water Supply from the Upper Riparian State (India)

Pakistan's Indus River System Authority has confronted a substantial reduction in water supply.⁷⁷ Muttahida Kisan Mihaz has calculated that, owing to restricted water flows from the upper riparian state (India), major subsidiaries of the western rivers in Pakistan, such as the Marala and Upper Chenab Rivers as well as the Bambawali-Ravi-Bedian canals, have permanently dried or stagnated.⁷⁸

In this context, it is estimated that by 2025 the water needs for agrarian and domestic purposes in Pakistan will be 203 million acre-feet ("MAF"), whereas water availability in the country will be 150 MAF, which means that there will be a thirty-five percent deficit in water supply.⁷⁹ This is a significant water deficiency that will create a food crisis in the country and region amid the water crisis.⁸⁰

Reports have confirmed that seventy-eight percent of cultivated land in Pakistan relies on freshwater sources and that twenty-two

⁷⁴ See *Pakistan: Geography, Climate and Population*, AQUASTAT 7 (2011), http://www.fao.org/nr/water/aquastat/countries_regions/pak/PAK-CP_eng.pdf.

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ *Water Reservoirs will be Depleted by Feb start*, PAKISTAN AGRIC. RESEARCH (2016), <http://par.com.pk/news/water-reservoirs-will-be-depleted-by-feb-start>.

⁷⁸ See Rahman, *supra* note 51, at 154.

⁷⁹ *Water Scarcity in Pakistan and the Future Strategy*, THE TIMES OF ISLAMABAD (2014), <https://timesofislamabad.com/water-scarcity-pakistan-futurestrategy/2016/08/31/>.

⁸⁰ *Id.*

percent of land currently relies on groundwater sources.⁸¹ Owing to water scarcity, farmers rely heavily on groundwater, which not only increases the cost of water in terms of the electricity consumed to pump it but also escalates soil salinity, thus decreasing crop yields.⁸²

1. Decreased Water Flow from the Upper Riparian State (India).

Pakistan officials argue that India has been reducing Pakistan's water flow by taking advantage of being an upper riparian state. India maintains that as a matter of priority it will start building more "storage facilities" and "navigation canals" to divert water away from Pakistan, disregarding the IWT.⁸³ Pakistan argues that such construction works and storage facilities have contributed to water scarcity in the country.⁸⁴

In the same context, while constructing similar storage facilities in the previous times—during the Indian construction of Baglihar Dam in 2008—it is estimated that the construction work affected thirteen million acres of farmland in Pakistan and consequently forced the farmers to change their crops. This resulted in stimulated food shortage in the agrarian country.⁸⁵ Similarly, a former commissioner of the Indus Water Commission, Mr. Jamaat Ali Shah, pronounced that India throughout the construction of Baglihar Dam denied Pakistan 1.2 million cusecs of water to which it was entitled.⁸⁶ Experts have further calculated that during the construction of the Baglihar Dam, Pakistan lost five billion Pakistani Rupees in crops.⁸⁷ Such undertakings of water stoppings can not only disturb Pakistan's economy by upsetting agricultural yields and industrial production, but can also distress millions of civilians in Pakistan by depriving them of access to fresh

⁸¹ See *Pakistan: Geography, Climate and Population*, AQUASTAT 7 (2011), http://www.fao.org/nr/water/aquastat/countries_regions/pak/PAK-CP_eng.pdf.

⁸² See Rahman, *supra* note 49, at 151.

⁸³ Navin Singh Khadka, *Are India and Pakistan Set for Water Wars?*, BBC (2016), <http://www.bbc.com/news/world-asia-37521897>.

⁸⁴ *Id.*

⁸⁵ Amer Rizwan Khattak, *World Bank Neutral Expert's Determination on Baglihar Dam: Implications for India-Pakistan Relations*, PAKISTAN HORIZON 89, 89-108 (2008), www.jstor.org/stable/23725987; see also Rahman, *supra* note 51, at 151.

⁸⁶ See Rahman, *supra* note 49, at 152.

⁸⁷ *Id.*

water for drinking and domestic purposes, acting as “water bombs.”⁸⁸

2. Effects of Indian-Controlled Water Flows on Power Production in Pakistan

Pakistan also relies on water resources for power generation purposes, as hydroelectric power plants produce more than thirty percent of its power.⁸⁹ Because of decreases in the water supply during the construction of the Baghliar Dam in 2008, there was also low production of hydroelectricity due to decreased water supplies in the canal system.⁹⁰ Consequently, the Pakistani government denied power supply to steel plants and hundreds of textile mills in order to meet the general public’s electricity demands.⁹¹ It is, therefore, safe to conclude that shortfalls in the water supply from the upper riparian state will not only disturb Pakistan’s agriculture sector but also distress the industrial sector and injure the economy of the lower riparian state.⁹²

3. Effects of Decreased Water Flows on Environment and Health in Pakistan

The International Water Management Institute has noted in its report that decreases in Pakistan’s river flows have not only widely instigated water, food, and health crises, but have also triggered environmental degradation—by running canals and riverbeds dry, the regional flora and fauna have been acutely impacted.⁹³ The report further established that decreased water supply would also act as a negative factor in the overall health of the general populace in Pakistan.⁹⁴ In this regard, the report illustrated that water supply is

⁸⁸ *Id.*

⁸⁹ *Pakistan: Energy and Heat for 2014*, INT’L ENERGY AGENCY, <https://www.iea.org/statistics/statisticssearch/report/?country=Pakistan&product=electricityandheat> (last visited Jan. 20, 2017); *Pakistan Energy Stats*, NATIONMASTER, <http://www.nationmaster.com/country-info/profiles/Pakistan/Energy> (last visited Jan. 20, 2017).

⁹⁰ See Rahman, *supra* note 49, at 154.

⁹¹ *Id.*

⁹² *Id.* at 147.

⁹³ Asad Sarwar Qureshi et al., *Sustaining Surface and Groundwater Resources*, INT’L WATER MGMT. INST. 6-7 (2002).

⁹⁴ *Id.* at 6.

directly proportional to hygiene because dry riverbeds, a result of changes in watercourses coupled with stagnant waters, are the breeding grounds for several diseases and health conditions. This inevitably increases the infant mortality rate, the number of diarrhea epidemics, and certain diseases such as malaria, encephalitis, and many more.⁹⁵

C. Water Scarcity Due to Surge in Population

The Center for International Earth Science Information Network has put forward global data on water scarcity and its relation to increased population, as well as listed Pakistan among the most stressed countries in regard to water scarcity because of its growth in population in recent years.⁹⁶ Its reports further added that the population of Pakistan will reach 225 million by the end of 2025, which is near double its population 25 years ago and almost 7.6 times its population at the time of its independence.⁹⁷ The Center for International Earth Science Information Network further noted that such surges in the population will not only instigate water scarcity in the region but will also create food scarcity and economic devastation.⁹⁸

Experts have concluded that Pakistan may become a red zone for water shortages and water crises by 2035, but some experts maintain that this may happen by 2020.⁹⁹ In this regard, the International Water Management Institute, a subsidiary of the Consultative Group on International Agricultural Research, researches pliable managerial system for arable lands.¹⁰⁰ It has noted that a sudden surge in the global population has been a vital factor in contributing to the recent water crises.¹⁰¹ It is not difficult to comprehend that water supply in per

⁹⁵ *Id.*

⁹⁶ PAVEL KABAT ET AL., *VEGETATION, WATER, HUMANS AND CLIMATE* 517 (2012).

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ Samia Altaf et al., *Running on Empty: Pakistan's Water Crisis*, WOODROW WILSON INT'L CTR. FOR SCHOLARS 5 (2009).

¹⁰⁰ See IWMI, *Who We Are* <http://www.iwmi.cgiar.org/about/who-we-are/> (last visited Jan. 30, 2018).

¹⁰¹ Asad Sarwar Qureshi et al., *Sustaining Surface and Groundwater Resources*, INT'L WATER MGMT. INST. 5 (2002).

capita terms is inversely proportional to the population of a country.¹⁰² Therefore, Pakistan's water availability in per capita terms has greatly declined over the decades.¹⁰³ For instance, in the year 1947, the population was 30 million, whom collectively shared 130 MAF of water, thus having 5,416 m³ per capita (taking water as constant).¹⁰⁴ The population of Pakistan then increased and by the year 2017 it was 196 million, which means that the availability of fresh water was 829 m³ per capita in 2017.¹⁰⁵ However, there has been a decrease in the water supply as well, as discussed in the previous subsection, which is not used as a factor in this calculation.¹⁰⁶

IV. INDIAN PROJECTS AND PAKISTAN RESPONSES IN WATER CRISIS EQUATION

In 1948, the first year after independence, by violating the bilateral agreement, India blocked Pakistan's waters—the irrigation source for 1.6 million acres of farmland—to create political pressure during political and regional conflicts over Kashmir.¹⁰⁷ Consequently, in 1960, Pakistan and India again bilaterally agreed to allocate the western rivers, including the Indus, Jhelum, and Chenab, for the exclusive and unrestricted use of Pakistan and to allocate the eastern rivers, including the Sutlej, Ravi, and Beas, to India in the same manner.¹⁰⁸ This agreement is known as the IWT, and it was brokered by the World Bank in 1960.¹⁰⁹ It was a condition of this treaty that both parties could enjoy the exclusive and unrestricted use of their respective allocated rivers; however, both parties can use waters from each other's allocated rivers

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ See *Pakistan Population*, <http://www.worldometers.info/world-population/pakistan-population/> (last visited Jan. 20, 2017).

¹⁰⁶ See Rahman, *supra* note 49, at 147.

¹⁰⁷ DHIRENDRA VAJPEYI, WATER RESOURCE CONFLICTS AND INTERNATIONAL SECURITY: A GLOBAL PERSPECTIVE 117 (2012); Waseem Ahmad Qureshi, *The Indo-Pakistan Water Conflict*, THE NEWS.COM (2006) <https://www.thenews.com.pk/print/174428-The-Indo-Pakistan-water-conflict>.

¹⁰⁸ See Rahman, *supra* note 49, at 147-48.

¹⁰⁹ DEEPA VISWAM, ROLE OF MEDIA IN KASHMIR CRISIS 66 (2010); *id.*

only for run-of-the-river hydroelectricity power plants and nonconsumptive uses, with a clear emphasis on water flows, stating that water flow should remain undisturbed by such nonconsumptive usage while using each other's waters.¹¹⁰

This Section will explore water projects by India over the waters of the western rivers that are allocated to Pakistan. The First sub-section will touch on certain construction projects with regard to their details¹¹¹ and will discuss how these Indian projects are constricting Pakistan's water flows by taking advantage of being an upper riparian state.¹¹² The treaty explicitly prohibits India from disturbing the natural flows of the western rivers or using the waters of these rivers for storage or consumptive purposes.¹¹³ The next sub-section will succinctly touch upon managerial and administrative steps taken by Pakistan, in addition to legal mechanisms for dispute resolution, to seek justice in regard to its water crisis.¹¹⁴

A. Indian Projects

In 1984, India commenced construction of the Wullar Barrage, also known as the Tulbul Navigation Project, over the western rivers to navigate water flows away from Pakistan, in violation of the IWT.¹¹⁵ Rajev Gandhi halted the construction in 1987 after substantial protests in Pakistan.¹¹⁶

In 2008, at the opening ceremony of India's controversial Baglihar Dam, Manmohan Singh, the then prime minister, admitted that there were sixty-seven more dams under way over the western rivers

¹¹⁰ *India, Pakistan, and International Bank for Reconstruction and Development*, THE INDUS WATERS TREATY 1960 126, 134-36 (1960); see also MUNIR OZTURK ET AL., PLANTS, POLLUTANTS AND REMEDIATION 116 (2016).

¹¹¹ See *infra* Section A.

¹¹² *Id.*

¹¹³ *Id.*

¹¹⁴ See *infra* Section B.

¹¹⁵ Musa Khan Jalalzai, *A New Hope for Peace in South Asia: India-Pakistan Relations, Nuclear Weapons, and Cross Border Infiltration*, AL-ABBAS INT'L 212 (2005).

¹¹⁶ *Id.*

allocated to Pakistan, most specifically in “Jammu Kashmir”¹¹⁷ Indian-occupied Kashmir is a disputed area between Pakistan and India, in which almost all of the western rivers form.¹¹⁸ The IWT allows the construction of projects only for run-of-the-river hydroelectricity purposes¹¹⁹ and explicitly prohibits the construction of dams for storage purposes and agrarian usage or projects that change the water flows or India’s redirection of waters from the western rivers.¹²⁰ Conversely, India is working at a significant pace to acquire freshwater reservoirs, especially in the western rivers—which were specifically allocated to Pakistan by the IWT—for prohibited storage purposes and consumptive purposes.¹²¹ This can be easily deduced because India has almost 4,291 large dams, of which the largest seventy-three percent are exclusively constructed in the western waters;¹²² however, India is continuing to build hundreds of more dams on the western rivers¹²³ and only a few on the eastern waters to establish the economic and political dependency of Pakistan on India by taking the advantage of being an upper riparian state and by taking control of natural reservoirs.¹²⁴ As a result, several dams have been contested by Pakistan and have become controversial over the decades.¹²⁵ However, only the most infamous and provocative construction works will be discussed in this Section.¹²⁶ In previous times, Pakistan has questioned numerous Indian water storage and navigational projects, which despite the condition under the IWT that their water flows are not to be disturbed by India, have affected water

¹¹⁷ AVTAR SINGH BHASIN, *INDIA’S FOREIGN RELATIONS – 2008* 1368 (2009).

¹¹⁸ *See* MOHAN C. BHANDARI, *SOLVING KASHMIR* 180 (2006).

¹¹⁹ *India, Pakistan, and International Bank for Reconstruction and Development, THE INDUS WATERS TREATY* 1960 126, 134-36 (1960).

¹²⁰ *See id.*; *see also* MUNIR OZTURK ET AL., *PLANTS, POLLUTANTS AND REMEDIATION* 116 (2016).

¹²¹ *Id.*

¹²² MALAYALA MANORAMA, *MANORAMA YEARBOOK* 573 (2004).

¹²³ *See* SHARAD K. JAIN, PUSHPENDRA K. AGARWAL AND VIJAY P. SINGH, *HYDROLOGY AND WATER RESOURCES OF INDIA* 940 (2007).

¹²⁴ Muhammad Adeel, *Indus Water Treaty & the Case for Hydro-hegemony*, CSCR (Dec. 5, 2016), <https://cscr.pk/pdf/rb/IndusTreaty.pdf>.

¹²⁵ Hussain Ahmad Siddiqui, *Money Matters: Troubled Water*, *THE INTERNATIONAL NEWS* (Nov. 21, 2016), <https://www.thenews.com.pk/magazine/money-matters/166376-Troubled-water>.

¹²⁶ *See infra* Sections III.

flows in the western rivers allocated to Pakistan.¹²⁷ However, by the time the dams are contested in the highest forums of the dispute resolution mechanism under the IWT, the dam has usually been completed, or it has incurred so much cost that the dispute resolution forums are ineffective to provide justice to Pakistan.¹²⁸ Therefore, only projects that are highly controversial or that are under construction are discussed here.¹²⁹

1. The Wullar Barrage

The Wullar Barrage, also known as the Tulbul Navigation Project, is a water navigation project with a water storage capacity of 0.3 MAF—thirty-two times more than the allowed capacity in the IWT.¹³⁰ The barrage, constructed mainly at Wullar Lake in Kashmir, is 435 feet long and 40 feet wide, made for the purposes of changing the watercourse of the western rivers by installing a new navigation barrage system over the headworks of the Chenab and Jhelum Rivers.¹³¹ Experts estimated that this construction work would decrease water flows in Pakistan and would make three major canals in Pakistan—the Upper Jhelum, the Upper Chenab, and the Lower Bari Doab—completely dry;¹³² further, the reduced water flow was said to reduce the capacity of Pakistan's Mangla Dam to produce energy.¹³³ The construction work was halted officially in 1987 because it violated Article 1(11) and Article 3(8) of the IWT,¹³⁴ but it has emerged that India is working on this project at full pace and is still seeking to

¹²⁷ *India, Pakistan, and International Bank for Reconstruction and Development*, THE INDUS WATERS TREATY 1960 126, 134-36 (1960); see also MUNIR OZTURK ET AL., PLANTS, POLLUTANTS AND REMEDIATION 116 (2016).

¹²⁸ See Muhammad Adeel, *Indus Water Treaty & the Case for Hydro-Hegemony*, 2, 4-6 (2016).

¹²⁹ See *infra* Sections III.

¹³⁰ M. Z. KIANI, PAKISTAN OUTLOOK 40-42 (1991); see also Gitanjali Bakshi & Sahiba Trivedi, *The Indus Equation*, SFG 23 (2011), http://www.strategicforesight.com/publication_pdf/10345110617.pdf.

¹³¹ ZAFAR ADEEL ET AL., IMAGINING INDUSTAN 39-42 (2016).

¹³² MOONIS AHMAR, THE CHALLENGES OF CONFIDENCE-BUILDING MEASURES IN SOUTH ASIA 397-98 (2001).

¹³³ See Adeel, *supra* note 132.

¹³⁴ Ikram Sehgal, 8 DEFENCE JOURNAL (2005).

complete it.¹³⁵

2. The Kishanganga Project

The water storage capacity of this project is estimated to be 1.8 MAF, extending 268 meters in length and 75.48 meters in height.¹³⁶ Completion of this project will cause a reduction of water flow by sixty-one percent in the western Neelum River in Pakistan, which will cause a thirty percent reduction of power production in Pakistan's new projects on the Neelum River.¹³⁷ It is further estimated that this project will also harm Pakistan's economy by costing it more than \$145 million annually.¹³⁸ This dam is being built solely for storage purposes and its capacity is many times more than the allowed dead storage capacity under the IWT.¹³⁹

3. The Bursar Dam

This project is another example of a considerable storage facility over the western Jhelum and Chenab Rivers, with a storage capacity of 2.2 MAF.¹⁴⁰ The dam will be 829 feet high¹⁴¹ and will plunge 4,900 acres of thick forest under water, which will not only change river flows in the downstream Pakistani western rivers and affect Pakistan's economy by disturbing the agriculture and power production sectors, but will also destroy the ecosystem, which is home to fifteen mammal

¹³⁵ *India Rejects Pakistan Objections, Work on Tulbul Navigation Project in Full Swing*, NORTH LINES (October 7, 2016), <http://thenorthlines.com/india-rejects-pak-objections-work-tulbul-navigation-project-full-swing/>.

¹³⁶ See C.A. BREBBIA, *WATER & SOCIETY* 2, 104-05 (2013).

¹³⁷ *Id.* at 105.

¹³⁸ *Id.* at 105-06.

¹³⁹ *Id.*

¹⁴⁰ Nosheen & Toheeda, *Indus Water Treaty & Emerging Water Issues*, 280, *ABASYN J. SOC. SCI.*, Vol. 4, No. 2, <https://www.scribd.com/document/255015776/indus-water-treaty-emerging-water-issues> (last visited January 20, 2017); see also C.A. BREBBIA, *WATER AND SOCIETY* II 106 (WIT Press 2013).

¹⁴¹ Nosheen et al., *Indus Water Treaty & Emerging Water Issues*, 4 *ABASYN J. SOC. SCI.* 265, 280 <https://www.scribd.com/document/255015776/indus-water-treaty-emerging-water-issues> (last visited January 20, 2017); see also C.A. BREBBIA, *WATER AND SOCIETY* II 106 (WIT Press 2013).

species, including the Himalayan black and brown bears and the musk deer, as well as exotic birds and uncountable species.¹⁴²

***B. Contemporary, Administrative, and Legal Responses
by Pakistan Amid the Water Crisis***

Through these construction works of dams and power projects, India has over time established its aptitude to control the diversion of western waters and store waters in its storage facilities, and thus enabled it to bring drought and flood to Pakistan at whim.¹⁴³ It has been calculated that India could stop all Pakistan water flows for at least twenty-five to twenty-six days in a row.¹⁴⁴ It is feared that this Indian capacity will be used against Pakistan at times of conflict and war by instigating water, food, and economic crises in Pakistan, hence enabling India to ensure political supremacy during political skirmishes.¹⁴⁵ For instance, India has disturbed water flows on the Chenab River to fill its Baglihar Dam, which resulted in decreased water flows in Pakistan.¹⁴⁶

In this regard, Dr. John Briscoe, professor of environmental engineering and environmental health at Harvard University, has noted that,

[In case of Baglihar Pakistan's] vulnerability was driven home when India chose to fill Baglihar exactly at the time when it would impose maximum harm on farmers in downstream Pakistan. . . [F]ollowing Baglihar is a veritable caravan of Indian projects, i.e., Kishanganga, Sawalkot, Pakuldul, Dal Huste, Gyspa. . . .The cumulative live storage will be large, giving India an unquestionable capacity to have

¹⁴² Nosheen et al., *Indus Water Treaty & Emerging Water Issues*, 4 ABASYN J. SOC. SCI. 281 <https://www.scribd.com/document/255015776/indus-water-treaty-emerging-water-issues> (last visited January 20, 2017).

¹⁴³ ANDREW GUZMAN, OVERHEATED: THE HUMAN COST OF CLIMATE CHANGE 159 (2013).

¹⁴⁴ Khalid Chandio, *India Re-Thinking Indus Water Treaty*, IPRI (August 27, 2014), <http://www.ipripak.org/india-re-thinking-indus-water-treaty/>.

¹⁴⁵ *Id.*

¹⁴⁶ DANIEL MORAN, CLIMATE CHANGE & NATIONAL SECURITY 93 (2011).

major impact on the timing of flows.¹⁴⁷

Furthermore, experts have assessed that India has increased its capacity to control water flows in the Chenab River by six or seven times, and India is now capable of completely stopping water flows on the Chenab River for forty days.¹⁴⁸ Similarly, the Indian Kishanganaga Project will increase the Indian capability to stop water flows in downstream Pakistan on the Jhelum River for fourteen days, and the Wullar Barrage will increase Indian ability to halt the Jhelum River completely for thirty days.¹⁴⁹

Indian capacity to bring drought and flood at whim—by developing structures capable of storing, diverting and changing the flows of the western rivers—has been a serious concern of the Pakistani authorities.¹⁵⁰ Seemingly, not only has decreased water supply affected the natural ecosystem — comprising the regional flora and fauna — dried tributaries of the western rivers, brought economic devastation, and decreased power generation capacity, but has also caused various floods in downstream Pakistan.¹⁵¹ In this regard, Federal Flood Commission estimates show that “Pakistan has suffered a cumulative financial loss of more than \$37.554 billion during the past sixty-six years. From 1950 to 2013, around 11,572 people lost their lives, some 188,531 villages damaged or destroyed, and a total area of 603,942 square kilometres were affected due to twenty-one major floods.”¹⁵² To curb such devastating consequences of disturbing the environment and ecosystem in the regions, the Pakistani authorities have initiated certain programs to develop resource management and consequently increase hydropower generation.¹⁵³ This will most specifically include building

¹⁴⁷ John Briscoe, *War or Peace in the Indus*, SACW (April 3, 2010), <http://www.sacw.net/article1391.html>.

¹⁴⁸ See Chandio, *supra* note 145.

¹⁴⁹ See Chandio, *supra* note 145.

¹⁵⁰ See Moran, *supra* note 146.

¹⁵¹ DANISH MUSTAFA, WATER RESOURCE MANAGEMENT IN A VULNERABLE WORLD 36 (2013).

¹⁵² *Id.*

¹⁵³ *Water, 11th Five Year Plan*, MINISTRY OF WATER MANAG. & REFORM, PAK. GOV. 223, 226, <http://pc.gov.pk/uploads//plans//Ch20-Water1.pdf> (last visited January 20, 2017).

storage facilities and power plants, to be better able to manage water and energy crises in the country.¹⁵⁴ In this context, the Water and Power Development Authority has classified several sites that are best suited for water storage and energy production purposes. The same Authority has estimated that such sites will be able to store 65 MAF of water and will be able to produce 35,000 megawatts of electricity.¹⁵⁵ In this regard, one of the largest projects will be the Diamer-Basha Project, which will have a 6.4 MAF water storage capacity and 4,500 megawatts of power generation capacity.¹⁵⁶ Furthermore, six projects, the smallest already under way, will collectively have capacities of 2.3 MAF and 127 MW in water storage and power generation, respectively.¹⁵⁷

V. CONCLUSION

Due to a surge in population and concurrent economic progression, water has become an unparalleled resource that has paramount global significance owing to its mismanagement and increased demand overseas; an era of water scarcity has been fashioned. Given the rise in water crises in recent times, corporations and most notably upper riparian states tend to foresee the future significance of water resources in economic terms and retain natural freshwater reservoirs. This greed has increased competition to develop man-made freshwater reservoirs in the hope of storing water, better navigating the waters, further managing the water flows, generating hydroelectricity, and controlling geopolitics.

However, as a consequence such projects disturb water flows, inevitably ruin ecosystems by destroying forests, including flora and fauna, and, most notably, decrease water flows in downstream areas, affecting the lives of millions of people in the lower riparian state. In this regard, Indian projects and construction works over the western waters have depleted downstream tributaries. Hitherto, contrary to the contentions of this Article, the official Indian stance, to defend its aggressive water impediments in the western waters, has maintained that water scarcity in Pakistan is mainly due to canal mismanagement,

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ *Id.* at 233.

glacial ebbing, decreased rainfalls, and thirty-eight MAF of freshwater sea excretion in Pakistan.¹⁵⁸

Because the Indian projects over western waters are acting as impediments, the average water flows in the western rivers of Pakistan have declined substantially, which in downstream Pakistan through the world's largest canal system, provides for twenty million hectares of land.¹⁵⁹ Further, India is seeking to establish 135 more dams on the western waters, including twenty-four projects over the Indus River, seventy-seven projects over the Jhelum River, and thirty-four projects over the Chenab River.¹⁶⁰ The entire argument that run-of-the-river water projects do not affect the water flows of the lower riparian is flawed because waters are diverted toward project tunnels, which leave downstream rivers dry. Similarly, all projects raise the water level and decrease water flow because any given project stores waters for peaking purposes.¹⁶¹ These projects, as a consequence, not only decrease the water flow of the western waters but also pose a great threat toward the regional environment and further create water scarcity in Pakistan.¹⁶² It is pertinent to note here that Pakistan has several rights of unrestricted use of the western waters, including: the right to equitable water apportionment as Pakistan strategically shares the natural river basin water flow in the downstream region; and the right, under the conditions of the bilaterally agreed treaty by to not have its access to the western water flow blocked by India. Under the treaty India is not allowed to use waters from the western rivers for storage or consumptive purposes, divert the water flows of allocated rivers to Pakistan, or to decrease the natural flows of the western rivers.¹⁶³ Accordingly, major Indian construction works over the western waters, but not over the eastern

¹⁵⁸ Shaheen Akhtar, *Emerging Challenges to Indus Waters Treaty*, INST. REG'L STUDIES, <http://www.irs.org.pk/f310.pdf> (last visited January 21, 2017).

¹⁵⁹ *Id.*

¹⁶⁰ *Id.*; see also Muhammad Suleman Khan, *An Odious Indian Plan*, THE NATION (May 22, 2010), <http://nation.com.pk/columns/22-Jul-2010/An-odious-Indian-plan>.

¹⁶¹ See Akhtar, *supra* note 158, at 58.

¹⁶² *Id.*

¹⁶³ *India, Pakistan, and International Bank for Reconstruction and Development*, THE INDUS WATERS TREATY 1960 126, 134-36 (1960); see also MUNIR OZTURK ET AL., PLANTS, POLLUTANTS AND REMEDIATION 116 (2016).

waters, are geopolitical, strategic maneuvers for economic and regional gain that during times of conflict or war can be used as a persuasive tool.¹⁶⁴

In understanding this nexus, Pakistani authorities objected to every proscribed project in all available forums.¹⁶⁵ Appallingly, the international community is not interested in resolving this issue permanently; therefore, Pakistan has developed water management programs and projects so that the state is better able to cope with the scant resources available.

However, it is feared that if the international organizations, neutral parties, and the international community do not forestall these forthcoming crises by thwarting Indian water aggression to ease the tension, skirmishes will become confrontations in the form of wars; the two hostile neighboring countries have nuclear capabilities and encompass billions in population. As Kofi Annan, the former secretary-general of the United Nations, anticipated in March 2001, “[f]ierce competition over fresh water may well become a source of conflict and wars in the future.”¹⁶⁶

¹⁶⁴ See Guzman, *supra* note 144.

¹⁶⁵ *Id.*

¹⁶⁶ Alexander Carius et al., *Water, Conflict, and Cooperation*, THE UNITED NATIONS AND ENVTL. SEC.(2004), https://www.wilsoncenter.org/sites/default/files/ecspr10_unf-caribelko.pdf.