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Reviewing the Indus Water Treaty in Regards to Future Challenges

A Master's Thesis submitted for the degree of
"Master of Science"

supervised by
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Affidavit

I, **ANASTASIA BEATRICE KROL**, hereby declare

1. that I am the sole author of the present Master's Thesis, "REVIEWING THE INDUS WATER TREATY IN REGARDS T O FUTURE CHALLENGES", 45 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
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Abstract

For the past five decades, the Indus Water Treaty (IWT) has been considered as the cornerstone for trans-boundary water sharing and mutual cooperation between two neighbours otherwise locked in mutual enmity. Increasingly, the threat of climate change, over population, energy needs and the interests of important regional stakeholder neighbours such as China have become part of the equation and the Treaty's capacity as a stabiliser of the region is questioned. For this reason, this thesis seeks to identify historical indicators behind the creation of the Treaty as well as to classify India and Pakistan's access to water and whether, in the case of a war breaking out between them, each could survive if access to the Indus, as set out under the IWT, is forcibly cut off. Following this segment, this thesis asks whether the increasing inability of the Treaty to keep both riparians from squabbling lies in the aging structure and use of general language, thus the IWT is compared to the 1995 Mekong River Agreement and the Danube River Convention of 1948. The three documents are compared against each other in terms of structure, language and implementing bodies. After this, the IWT is assessed for flaws which are again compared to the 1995 Mekong River Agreement and the Danube River Convention of 1948. The three areas discussed and compared are: dispute resolution, climate change and environmental issues and China. The discussions of research and conclusion both settle on the idea that the IWT, though previously successful is in dire need of a facelift in order to fit future concerns such as further population growth, water and energy demands and climate change.

Keywords: Indus River Treaty, challenges, Pakistan, India,

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List of Abbreviations

BC	Before Christ
BRI	Belt Road Initiative
CPEC	China Pakistan Economic Corridor
DRPC	Danube River Protection Convention
GDP	Gross Domestic Product
ICJ	International Court of Justice
ICIMOD	International Centre for Integrated Mountain Development
ICPDR	International Commission for the Protection of the Danube River
IHK	Indian Held Kashmir
IWT	Indus Water Treaty
JuD	Jamaat-ud-Dawa
MA	Mekong Agreement
MAF	Million Acre Feet
MFA	Ministry of Foreign Affairs
MRC	Mekong River Commission
MW	Mega Watts
NMC	National Mekong Committees
PCA	Permanent Court of Arbitration
PMKM	Pakistan Mutahidda Kissan Mehaz
PML-Q	Pakistan Muslim League
TFDD	Trans-boundary Freshwater Dispute Database
UN	United Nations
WSI	Water Stress Index

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1 Introduction

Globally, pure water resources are dangerously low in supply against an impossibly high and growing demand. Just 2.79% of global water resources is fresh water, with just 0.03% adequate for human consumption (Padowski and Jawitz, 2009). An estimated global birth rate of 80 million people per year (Hinrichsen and Tacio, 2002) has put an extraordinary burden on natural resources, especially fresh water, of which there is only 64 billion cubic meters per year on average (Hinrichsen and Tacio, 2002). Aside from unchecked population growth, industrial demand, urban growth and changing community water usage habits are creating additional pressures on fresh water resources. A further emerging factor impacting negatively on predictable fresh water supply is climate change. It is known that water security has a clear impact on national security, taking into account food security, health, economic livelihood and national economics, thus the waning of available fresh water is sure to represent an ever more urgent source of anxiety, potentially leading to conflict within and across national borders. Currently, there are over 250 trans-boundary river basins and depending on these as a source of water are over three billion people (UN Water, 2017). The interrelationships between water and national security are clear and have been recognized by international leaders and scientists alike. UN Secretary General Boutros Boutros Ghali stated already in 1991 "...(the) next war will be fought over water, not politics" (Pipes, 2017).

In 1995, then chairman of the Global Water Partnership, Ismail Seragaldin contributed to this discussion by forecasting that future wars would be fought over water, rather than over oil or territory, as had been historically the case (Akhtar, 2010). The linkages between water security and national security were also highlighted by former UN Secretary General Ban Ki-moon in 2001. During his term in office, he emphasized the urgent need for the global community to actively respond to the issue. He assessed that today's water shortages could lead to future conflicts over the management of water resources. In addition, if overpopulation and climate change were not addressed as serious issues, water scarcity would continue to worsen (Deen, 2017).

As water security intensifies as a threat to national and international security, fierce competition over management, storage and control over fresh water sets apart the winners

and the losers, dictating international discussions on the correlation between freshwater resources and global peace.

Evan Valchos observes that water conflict erupts as a consequence of escalating discontent and disagreement between competing interest groups, commencing with generalised public dissatisfaction over water availability and management, growing into peaceful discussions over water management projects, then to disagreements regarding opposite opinions, and dividing public opinion. In his analysis, the cumulative effect of such discord can be to harden opposing camps into defined stakeholders who seek to build their support bases as a prelude to disobedience of public authority in the form of protests or resistance, or to mutual violence between opposing camps (Vlachos, 2004).

This kind of classification of clashes and conflicts is well-fitted to the example of rivers, basins and fresh water sources as international flows over shared borders, where human activity causes disruption to flows (upstream dams and agriculture), there is competition for greater power (water hegemony), or as a result of hydrological events (floods or droughts) (Vlachos, 2004). Future causes of disagreement are on their way to becoming more varied, however, based on groupings of inner and outer deliberations and the overlaid effects of climate change.

Current available literature on conflict or disputes between riparian states based on water emphasizes the fact that water and its availability, management and storage can lead to conflicts. However, what is left unclear is at what level such conflict may take place. The current concern is that increasing effects stemming from climate change will continue to decrease fresh water sources and start a chain of water related conflict. Based on historical patterns and evidence, water experts have analysed the chance of there being a war caused by water. The debate is currently more on whether water conflicts are a variant of resource war or a mere management, to be resolved with the help of peaceful discussions. Professor Aaron Wolf from Oregon State University has evaluated data from 124 nations and 122 out of 265 international river basins and believes that there is a direct linkage connecting national and international insecurity and water scarcity. Academics from Oregon created the Trans-boundary Freshwater Dispute Database (TFDD), providing an account of all recorded trans-boundary water-based conflicts from 1948-2005 (Yoffe, 2001). According to the information provided on the database, Wolf came to the belief that historically, cooperation has been far

more important than conflict. Based on this, it can be concluded that international conflict to date has rarely been caused by water resources. So far, the political institutions put in charge of supervising water have been able to adapt successfully to issues dealing with water scarcity without needing to turn to conflict or war to safeguard water supplies. Rather, cooperation through whatever means, has emerged between stakeholder states. Such cooperative history is emphasized by the 157 international freshwater treaties that were signed between 1946 and 1999 (Michel et al., 2009). Wolf's work dilutes the pessimistic opinion on water conflict and emphasizes international cooperation between the riparian states.

A number of other academics see water as a national strategic resource that requires enforced protection. Peter H. Gleick of the Pacific Institute for Studies in Development, Environment and Security, is certain that conflict due to water-distribution disagreements will be a probability in the very-near future. He believes this despite the increasing number of formal agreements and treaties concerning present and future allocation of water. Gleick keeps a database on conflict chronology containing details of 203 incidents going back as far as 3000BC (Gleick, 2009). Gleick highlights six main types of water- related conflicts:

1. When the supply of water or direct access to it is the cause of conflict.
2. When water is used as a tool during a military operation.
3. When water is used for a political objective by terrorists or non-state actors.
4. When water is either a target or device towards violence or intimidation.
5. When water is targeted by military operations by states.
6. When water becomes the root of disagreement and differences when economic and social development are at stake.

Out of the points mentioned above, the ones most applicable to this thesis and India and Pakistan are points: one, three and six.

Due to points one, three and six being appropriate to the Indus Water Treaty, the IWT is for these reasons the most appropriate display of long-term peace over the sensitive issues of water-sharing, as it has brought India and Pakistan, neighbours with a sensitive and conflict-ridden history, into a position of mutual cooperation.

In addition, trans-boundary water experts cite a major factor that outlines the chance and intensity of a water-related conflict. This is the alteration in rate of physical change in the Indus system and quantity of water (Yoffe, 2001). Moreover, it is critical to bear in mind the dramatic pressure climate change will bring to bear on both factors mentioned above; this becomes even more apparent when hydro-politics is brought into discussion of the Indus Basin (Das, 2016).

As Pakistan is experiencing a steep decline in fresh water resources, questions of an existential scale are popping up throughout the country, owing to water being the most important natural resource to be secured for the future. As an agrarian society, Pakistan relies predominantly on the Indus Basin to meet its increasing domestic, agricultural and industrial demand. The increasing demands are due to economic development and a population multiplying at an unstoppable rate.

The population of East and West Pakistan (i.e. including today's Bangladesh) at Partition in 1947 was 33.7 million. The 2017 national census is expected to reveal that the current population of Pakistan (excluding Bangladesh)'s population has now reached over 200 million, and is expected to rise to around 400 million by 2050. (Ahmed, 2017) This rapidly increasing population combined with climate change create an unmanageable pressure on available water resources.

2 Goals and Objectives

This paper explores a potential review of the IWT as the current water discourse between India and Pakistan seems to be stuck 'between a rock and a hard place'. It examines in what ways the IWT is out-dated and in need of a review as climate change, population growth, economic development aspirations and lingering political tensions all mean that the Treaty established in 1960 is no longer able to provide the legal support that both nations are scrambling for.

To validate this argument, the Agreement on the Cooperation for Sustainable Development of the Mekong River Basin (Mekong Agreement) and the International Commission for the

Protection of the Danube River (ICPDR) will be compared against each other as well as the IWT in order to conclude what the IWT is lacking, which areas are in need of renewing, taking into consideration the differing political and economic environments.
Lastly, this paper shall examine and explain the brewing fear of water scarcity and conflict on both sides by considering sociological and diplomatic factors.

More precisely, the objectives of this thesis are:

- To examine the IWT and pinpoint in what areas it is failing India and Pakistan as a water-sharing Treaty
- To draw a comparison between the IWT and the Mekong Agreement as well as with the Danube Convention to establish their differences and establish what the IWT is missing
- To propose a possible process or roadmap towards a new treaty.

1.1 Methodology

In order to obtain an answer to the presented research question, this section of the thesis shall first consist of an examination of the drivers of current water discourses in Pakistan and India. Next, will come a comparative analysis section where the Indus Water Treaty will be compared against the Danube Convention and the Mekong Agreement. The comparative exercise will contribute to understanding why the current treaty is out of date and failing to deliver solutions. The comparison will also expose the key differences between the three treaties. This exercise will thus assist an assessment of what is missing from the Indus Water Treaty in order to steer a path to deliver the two countries' equitable share of its waters under contemporary and future conditions. While doing so, the major political, historic and economic differences between the riparians in question will also be taken into account.

3 Water Balance: Availability versus Demand

10 vital river basins as well as 1.3 billion people receive their share of fresh water from glacier and snow melt coming from the Himalayas (Qiu, 2016). Alarmingly, recent data confirms that Pakistan is receiving less water from the Indus than what it received 50 years ago (Qiu 2016). Such findings come as no surprise to the scientists studying the Indus and people relying on it for their daily water needs. The reasons lie in shrinking glaciers owing to climate change, accompanied by increasing competition for available water due to population growth and development.

To break it down, the Indus Basin is "a complex structure comprised of the Indus River, its tributaries, 2 large reservoirs, 19 barrages, 2 headworks, 42 canal commands and 12 link canals running into 56.000km of canals and 1.6 million km of water courses and field channels" (Akhtar 2010).

Such thoroughness with civil works and engineering has been so comprehensive that little (if any) thought has been devoted to an alternative socio-centric prototype that would encompass aspects of management, development and conservation of water resources. At present, the techno-centric prototype is under stress from two key limitations. These are: the increasing scarcity in water provisions, and the increasing shortage of funding dedicated towards operation and maintenance.

On a yearly basis Pakistan experiences water crises as the demand constantly surpasses the supply. As there are yearly high water demands, extracts from reservoirs reach maximum levels in the Mangla and Tarbela dams, resulting in being strained to dead-level every consecutive year. (Dead-level is a reference to occasions where water discharge from dams must be stopped as the minimum-required level of water has been reached) (Altaf et al. 2009). The Tarbela Dam remained at dead-level for 22 days every year between 2000 and 2004 and lingered at dead-level for 41 and 46 days in 2000 and 2004 (Altaf et al. 2009). The simple fact that the dams have since been torn down to dead-level is a reference of the seriousness of water shortage.

On a yearly basis, the total volume of water flow throughout the Indus changes. The annual variations are due to the amount of snowfall in the Karakoram and Himalayan ranges (Altaf et al. 2009).

Figure 1: Annual Western River Flows

Maximum flow in 1977-78	172.10 MAF
Minimum flow in 2001-01	97.13 MAF
Annual average flow	
1978-2008	140.00 MAF
1998-2008	128.52 MAF
"4 out of 5 years" annual average flow	
1978-2008	135.60 MAF
1998-2009	123.00 MAF
Note: MAF= Million Acre Feet	

(Source: Own depiction after: Altaf, S., M. Kugelman, R. M. Hathaway, and Woodrow Wilson International Center for Scholars, eds. Running on Empty: Pakistan's Water Crisis. Washington, D.C: Woodrow Wilson International Center for Scholars, 2009.

Shrinking water availability can be observed in the above table. Super floods occur on average every fifth year, equating in an increased average water flow of up to 140 million acre feet (MAF) (Altaf et al. 2009). Throughout the other four years, water availability on average has been 135.60 MAF (Altaf et al. 2009). Between the past 30 and 10 years, water availability statistics shows overall decreasing flow of water volume. Between 1978-2008, average flows equalled 140 MAF, while between 1998-2008, the flows decreased to 128.52 MAF (Altaf et al. 2009). In the last three decades, the highest river inflow was 172.10 MAF (Altaf et al. 2009).

It has been reported by Danial Hashmi, a hydrologist of the Pakistan Water and Power Development Authority in 2016, that the level of the Indus is slowly declining (Qiu, 2016). Arif Anwar; senior academic at the International Water Management Institute in Lahore, Pakistan, believes that the entire region's stability depends on water, and if this precious resource is to decline in quantity it could cause irreversible damage to the area (Qiu, 2016). As Anwar predicts demand for water in this region is expected to grow by "30% by 2025" (Qiu, 2016), we can expect to see an increase in water-based conflicts.

Spanning the core stem of the Indus and a system of hydrological stations in Pakistan is what Hashmi's data is grounded on. The resulting data confirms that between 1962 and 2014, the

total water flow dropped by 5%. Walter Immerzeel, hydrologist from Utrecht University agrees that such a slight decrease may not seem threatening, however such a decreasing trend over a long period of time may have irreparable effects on water resources and management (Qiu, 2016).

The team led by Hashmi concluded that the decline of the Indus is a seasonal event, seeing a decline in flows from April to August and a rise throughout the rest of the year. In addition, his team reported on a decrease in temperature in four river basins in Pakistan during the warmer months, despite an overall increase of temperature over the region. While 50-85% (Qiu, 2016) of river flow comes from melting glaciers and snow, Hashmi's team believes that springs and summers cooler in temperature lead to less snow and glacier melt, explaining the shrinking flow of water.

Glaciologist Tobias Bolch from University of Zurich notes that Hashmi's findings are in line with an occurrence called the "Karakoram anomaly". The Karakoram anomaly refers to some of the glaciers in the Karakoram region having stabilised and even grown, as opposed to most other mountain glaciers that are rapidly melting as a consequence of climate change.

The region's chillier springs and summers could have another possible explanation thanks to other studies. Hayley Fowler, climate modeller at Newcastle University, United Kingdom believes that as climate heats up on a global scale, monsoons invade with an increasing occurrence the mountainous areas of the upstream Indus where glaciers occur. Her work illustrates that when monsoons enter the region and force dry winds northwards, summer temperatures decrease. The main theory believed by her team is that a cooling effect during the summer parts of the year is caused by a monsoonal clouds flying over the region.

The prediction of how Himalayan waters will change is restricted by the limitations of climate modelling and a lack of field measurements in the region. Immarzeel and his team have provided recent work in finding that in the long-term, water availability in the region will become even scarcer. With the use of state-of-the-art climate modelling and making an assumption of the scenario where global greenhouse gas emissions peak between 2035-40, it was found by Immarzeel that the water flow into the Indus will stabilize and within the next few decades may possibly increase, but that once regional temperatures increase leading to the depletion of glaciers, scarcity of water will follow. Immarzeel and his team have found

that the area previously covered by glaciers has reduced by approximately 15% (Ragettli 2014).

A novel method was employed by Arthur Lutz of Utrecht University to perform this research in that complete international river basins were studied in unparalleled detail. Lutz believes that his studies are able to portray an increase in water flow until 2050. According to Lutz, despite the retreating glaciers which feed the Indus, due to increased temperatures they will provide higher quantities of water in the next few decades (Ragettli, 2014). Lutz's studies are echoed by Walter Immerzeel, who has cited Lutz's results as reflecting his own discovery (Ragettli, 2014).

The model projections provided by Lutz and Immerzeel are, however, only valid until 2050. Projections for the Indus River for the further future remain uncertain in which melt-water is a key feeder of water. Lutz explains that despite overall glacier withdrawal, until 2050 we will witness an increased amount of melting glaciers (Ragettli, 2014). Although glacier melt is projected to continue until 2050, there will eventually have to be a decrease in water coming from glacier melt, as the glaciers will have disappeared (Ragettli, 2014).

An even more comprehensive study than Lutz's is being carried out under the working name of title 'Himalayan Climate Change Adaptation Programme' (HICAP).According to the International Centre for Integrated Mountain Development (ICIMOD), "Our findings provide essential information to climate change adaptation policy makers in the twelve riparian countries of these rivers. Not only knowledge of changes in the total flow, but also better understanding about how the distribution of water is going to change throughout the year" (Ragettli, 2014). When creating policies for adaptation to climate change, such information will be useful to protect the people depending on these rivers.

As noted above, a number of studies are underway in an attempt to forecast scenarios up to the end of the 21st century. Upcoming work will also attempt to centralise work on how extreme conditions in water flow will be modified in the latter part of this century.

3.1 Storage

Against this backdrop, Pakistanis face the imminent need to boost their water storage capacity. Currently, Pakistan's reservoirs can only hold 30 days' worth of the nation's water needs. In comparison to 800 days in Australia and 150 days in India (Akhtar, 2010). Hydrologist Mobin-ud-Din Ahmad from the Commonwealth Scientific and Industrial Research Organisation in Canberra, Australia, states "It's an extremely dangerous situation, especially now, when severe droughts are increasingly common" (Akhtar, 2010).

Figure 2: Map of Indus Basin
(Source: Aljazeera, "Kashmir and the Politics of War", 2011)

3.2 Current water discourses: Water resources and demand in Pakistan

Pakistan suffers from being one of the driest nations on the planet, receiving an approximate average rainfall of less than 240mm per year (Briscoe et al. 2006). It is for this reason that Pakistan heavily relies on glacial melt in the western Himalayas (Briscoe et al. 2006) for its predominantly agrarian society. National and international reports have been performed relating to the country's current water situation, pointing out that Pakistan is rapidly going from water-stressed to water-scarce. According to the World Bank report published in 2006, 'Pakistan Strategic Country Environmental Assessment Report' there has been a dramatic fall in access to water. In 1947 Pakistan and then Bangladesh had access to 5,000 cubic meters and this fell to 1,100 cubic meters in 2006 for today's Pakistan (World Bank, 2006). The report additionally estimates that water availability will continue decreasing to below 700 cubic meters per person by 2025 (World Bank, 2006). The 2005 World Bank report warned that Pakistan is already in a precarious situation regarding water, and would ignore this situation at its future peril (Briscoe et al. 2006). A 2007 report by the Asia Development Bank observed that: "Pakistan is nearly at water scarcity threshold of 1,000 cubic meters/person/year." (Asian Development Bank, 2007) The Economic Survey of Pakistan (2009-10) claims that in Pakistan, water access per person is as low as 1066 (Government of Pakistan, 2010) cubic meters per person indicating how desperate the situation is and that, indeed, Pakistan is a water-scarce nation.

As a consequence, such a bleak outlook, the gap between supply and demand for water continues to widen. In 2004, water shortfall in Pakistan was 11 MAF (Akhtar, 2010). Water needs for Pakistan for the year 2025 is a cause for concern according to data forecasting. By 2025, the country's water availability will level today's availability of 236 billion cubic meters (Akhtar, 2010). Alarmingly, total water demand by 2025 is set to be approximately 338 billion cubic meters (Akhtar, 2010). This means that the gap between demand and availability is 100 billion cubic meters (Altaf et al. 2009).

Currently, Pakistan demands 139.54 MAF from the Indus system though the availability is 135.60 MAF, leaving a gap of 3.94 MAF (Altaf et al. 2009). The agricultural performance of Pakistan is directly linked to the supply of irrigation water which requires 93% (Altaf et al. 2009) of its river water. As previously noted, the economy of Pakistan greatly relies on the

agricultural sector. Agriculture accounts for over 21% of Pakistan's gross domestic product (GDP) and is the largest employer, taking responsibility for over 45% of Pakistan's manpower (Government of Pakistan, 2010). Almost 62% of Pakistan's population lives in the countryside, thus their area of residence is linked to their source of employment: agriculture (Government of Pakistan, 2010).

3.3 Current water discourses: Water resources and demand in India

Thanks to its proximity to Tibetan, Kashmiri and Himalayan water resources, India is better off, than Pakistan, as it is the upper riparian to the Indus basin. On top of this advantage, India hosts the Deccan Rivers; the Mahanadi, the Godavari, the Krishna, the Cauvery. Additionally, India has plans to divert water flow from the Brahmaputra and the Ganges. These projects have caused new tensions between Nepal, India and also Bangladesh as the other two countries would be impacted by India's exploitation of those water resources.

Despite its expansionary uses of available water sources , water availability per capita in India has also decreased from over 5000 cubic meters in 1950 to 1,800 cubic meters in 2005, with an estimated decline to 1000 cubic meters in 2025 (Waslekar, 2005). A common perception among Indians is that rather than addressing the pressures upon water availability caused by economic development, increasing urbanisation and overpopulation, a viable alternative is to develop long-lasting water supply projects (Ramaswamy, 2005). Increasing demand for electricity is the force behind hydropower in India as there is a need to reach power demands for the country's 9% yearly economic growth.

As a whole for India, in 2007-08 power demand was 108,886 Megawatts (MW) however the power demand created was a low 90,793 MW, leaving a deficit of 18,093 MW (Akhtar, 2010). Despite there being a push towards large hydro-power developments in India, 89% of these large projects all produce power below the demanded capacity (SANDRP, 2010).

By 2025, Pakistan's population is expected to balloon to over 300 million people (Dawn, 2015) while India's population is expected to surpass China's (The Hindu, 2016). With such extreme levels of population growth, the anticipated increase in water demand and

consequential pressure on the Indus the outlook for peaceful resolution of disputes between the two riparians is bleak.

3.4 Water discourse heats up

Since the 1990's both countries have experienced increasing water scarcity which has led to more frequent water-related arguments and pressure on the IWT. Communication is almost completely motivated by diminishing resources of fresh water, growing domestic demand and the two countries' degree of dependency on the trans-boundary water resources.
For the purpose of this thesis, water scarcity shall be measured with Falkenmark's Water Stress Index (Boesen and Ravnborg 2004). The Index is used by dividing the volume of accessible water by its inhabitants. When the result comes out as lower than 1700 meters cubed per annum, the country in question is considered as "water stressed" (Boesen and Ravnborg 2004). If the result is lower than 1,000 cubic meters per annum, the country is seen as "water scarce" and if the value is below 500 cubic it is "water poor" (Boesen and Ravnborg 2004). According to this index, India is "water stressed" while Pakistan is "water scarce", as fresh water availability per capita is at 1066m 3/person. " (Boesen and Ravnborg 2004)

In 2009, several UN organizations cautioned that we may be approaching the first water war as water has emerged as a further source of tension between India and Pakistan. These international organisations put together a report emphasizing that there is a direct link between water and national security, food security, energy and the economy. This report went deeper by stating that without resolving water issues, nations will be unable to address their other concerns, as they may intensify and congregate into an international crisis on all levels. (Dawn, 2010)

Nevertheless the intensity of mistrust between the two countries will ensure that sober and cooperative water discourse is constantly at risk of being distracted by or at risk of exacerbating bilateral tensions. In this vein, Indian analyst Arvind Gupta has suggested that the two nations ought to focus on the threat of terrorism, which is also a major topic between the riparians, and that water is being used as a tool to distract attention (Gupta, 2017).

4 Background

Water quality deterioration and shortage are considered to be key present and future challenges. Pakistan is entering an existential crisis as it is facing diminishing water resources. As an agrarian society, water security is the key to its economic sustainability and success and it must be managed and secured as quickly as possible. For this reason, dependence on the Indus Basin is huge as it is the single major river basin on its territory, but which is also a trans-boundary basin to cover domestic, agricultural and industrial demand. These demands are growing both as a result of economic development and a rapidly multiplying population. At the time of its creation in 1947, Pakistan's population in the Western portion of the country was 33.7 million. Currently estimated to be 206 million the population is forecast to grow to 400 million by 2050. (Dawn, 2015) When combined with climate change, in the absence of prudent policy and practice, there will be unsustainable pressure on available water resources.

The 1947 partition of British India created bitter, intractable enmity between the two states and spawned a clash over the waters stemming from the Indus Basin. The two new states were on opposite sides regarding the issue of how to manage and, more importantly, share the water from the Indus. India came out of the division as the upper riparian, leaving Pakistan feeling vulnerable to India controlling the flow of water that would continue onto Pakistan. As India began developing ideas to further benefit out of this new situation, Pakistan felt powerless to defend its main water resource.

Throughout the early years following Partition, the water was allocated by the Inter-Dominion Accord of May 4, 1948. The Accord made it a requirement for India to provide Pakistan with water in exchange for yearly payments from Pakistan. The Accord was created to meet short-term needs and discussions for a future solution followed. A deadlock was reached as neither Pakistan nor India was able to negotiate their positions. India believed that Pakistan couldn't do anything to stop India from implementing plans to change the flow of water.

David Lilienthal, former chairman of the Tennessee Valley Authority proposed in 1948 that the two riparians focus on areas where collaboration was still an option. His idea was for the

neighbours to come up with a cooperative system to manage and share the waters of the Indus Basin (Akhtar, 2010). Eugene Black, World Bank President at the time, took this message from David Lilienthal under serious consideration, along with India and Pakistan.

Black confirmed that the World Bank was monitoring progress being made by both India and Pakistan, however he believed that further dispute over the Indus could threaten all economic progress so far made. Previously, India had been against a third-party negotiation, however the World Bank eased its objections by saying it would not umpire the arguments, but merely act as a third-party to guide the two nations to agreement.

Black was smart enough to see a division between functional and political aspects in relation to the Indus conflict. He insisted that the conflict would not come to an end unless the two aspects; politics and the functioning of the Treaty were separated and dealt with separately. Black conceived the idea to put together a working group consisting of engineers from Pakistan, India and the World Bank. The World Bank engineers would be the consultants, there to offer recommendations and continue dialogue. Black's optimism stemmed from believing that as the problem was solely based on engineering, it could be solved by engineers.

However, Black's optimism was premature. The World Bank thought India and Pakistan would see eye to eye over the allocation on water, however, neither side was ready to cooperate. The World Bank grew ever more irritated due to the lack of progress. What the World Bank had originally imagined as technical disagreements quickly grew to wider proportions. Neither party was prepared to compromise or to agree on the technical features or on the application of any decided on circulation of waters. At last, in 1954, following two years of negotiations, the World Bank offered a new proposal, overstepping its assigned role by demanding that India and Pakistan consider plans for future use of the basin. The World Bank's offer gave Pakistan three western tributaries and India three eastern tributaries of the Basin.

While India was cooperative with the new proposal, Pakistan refused to accept it, as the reallocation paid no attention to historical use of the Indus Basin. In addition, West Punjab's Eastern regions were threatened by desertification, and the proposed solution took no consideration of Pakistan's recommendations. While India was for a new allocation system, Pakistan felt as if its share ought to take into account historical distribution. The plan

proposed by the World Bank took into consideration India's plans, infuriating Pakistan so much that they warned the World Bank that they would withdraw from the Working Party resulting in the collapse of negotiations. (Akhtar 2010)

In reality, neither riparian would completely withdraw as they could not afford to discontinue the negotiations. The Pakistani Government was not ready to sacrifice talks to create yet more disagreements with India and continued its part in the negotiations. India's motivation to put the Indus issue to rest was its water diversion schemes which were forced to be put on hold due to stalled negations. (Akhtar 2010)

In 1954 India and Pakistan put their differences aside to continue at the negotiating table. The proposal put forward by the World Bank was used as the basis of discussions and the negotiations carried on for a further six years.

There was one final obstacle which concerned the financial aspect of constructing canals and storage tanks for Pakistan. The World Bank created a financing plan provided by the United States and the United Kingdom. This was the final area of disagreement, and once it was settled, India and Pakistan signed the Treaty in 1960, separating the waters between the two riparians. Since then, this Treaty has been referred to as an example of settling differences and sharing international river system water in difficult conditions, owing to its having withstood three wars and other crises in the bilateral relationship.

India's commencement of several hydroelectric projects along its western rivers in recent years has led to Pakistani anxiety over its insecure water supply. Pakistan insists that such developments by their neighbour break their agreement as laid out in the Treaty and that the projects will disrupt water availability in the western river allocated to Pakistan. One dispute that arose over the Salal Dam (1978) was dealt with quickly, but suspicion over the Wullar Barrage/Tulbul Navigation project and Kishanganga hydroelectric dams remains a sensitive topic. The Baglihar Dam problem was dealt with thanks to the help of a Neutral Expert, a method of resolving disputes as laid out in the IWT. Despite this, continued work on the Baglihar Dam in 2008 was drastically felt by Pakistan as the level of water continued to shrink in the Chenab River, negatively impacting Punjab farmers. This is one example of charges against India "stealing" Pakistan's water. The Indian media are firm in their belief that India is not violating the Treaty, merely taking advantage of the water given to it by the

Treaty. In return, India accuses Pakistan for its stress caused by water scarcity as it claims it cannot properly manage and store the water that is allocated to it.

Pakistan's key contention is that the World Bank does not recognize its vulnerability to India's hydro developments. It maintains that the hydro developments ignore the trans-boundary bearings on the ecosystem and that it is also an abuse of the Treaty. Taking into consideration the ever increasing water woes on the Indus system, both countries should observe the Treaty as it was created in their interest. They may even take steps to guarantee a well-functioning water regime.

These steps are; guaranteeing transparency in the sharing of water data, regular data sharing, an agreement in safeguarding water quality, joint water management, supervision of water resources and the building up the working of the Indus Waters Commission by increasing its range of responsibilities.

Additionally, given its strategic significance for their collective and intertwined individual development, the two countries would also benefit from a strategic management plan for the Indus Basin, to underpin agricultural and industrial production, environmental needs and urban water modelling. Such a plan would inform usage of Indus waters for hydro energy as part of national energy mix planning. (It is estimated that only 15% of the energy potential of the Indus is currently harvested.) A joint strategic plan would ensure environmental responsibility through sustainable integrated water exploitation, and promote regional economic integration in addition to multi-sectoral national development benefits.

5 The Indus Water Treaty under Pressure

Pakistan constantly feels water-related anxiety caused by its neighbour arising from the Wullar Barrage, Baglihar and Kishenganga dams. Constant water scarcity, the almost complete dependence on fresh water from the Indus, helplessness against the rate at which India is creating dams, all fuel its heated water accusations against, and arguments with, India.

Of all Indian damming projects, the Pakistani Government has expressed the most concern over the Jhelum and Chenab rivers. In 2008, following a drop in the Chenab's waters due to the filling of the Baglihar Dam, Asif Ali Zardari, then President of Pakistan stated that that "Pakistan would be paying a very high price for India's move to block Pakistan's water supply from Chenab River." (The Hindu, 2008) He further told India "not to trade important regional objectives for short-term domestic goals." (The Hindu, 2008) He took a step further by warning in an article in *The Washington Post:* "The water crisis in Pakistan is directly linked to relations with India. Resolution could prevent an environmental catastrophe in South Asia, but failure to do so could fuel the fires of discontent that may lead to extremism and terrorism." (Zardari, 2009)

In 2010, Pakistan Planning Commission Deputy Chairman, Sardar Assef Ahmad Ali, stated that "India would have to cease "stealing" Pakistan's water as Pakistan will not waver to carry out a war with India if it did not cease doing so." (The News, 2010). Assef Ahmad Ali said this despite knowing that damaging the Treaty would open a Pandora's Box of diplomatic and political instability (Dawn, 2010). Chaudhry Shujaat Hussain, PML-Q former premier believed that if ignored, the water issue had the potential to become a topic of national security, more serious than terrorism (Bokhari, 2010). In 2010, Chief of Pakistan Muttahida Kisan Mahaz Party (PMKM), Ayub Mayo, observed that India had damaged the Pakistani irrigation system, however this was due to neglect by the Pakistanis. It is for this reason, he claimed, that a looming crisis threatened the agricultural sector of Pakistan (The News, 2010). Thanks to media spin, the main perception in Pakistan is that Indian violations of the IWT undermine Pakistan's rights to western rivers.

The water debate has also provoked interest on the part of religious militants in Pakistan. One extremist, virulently anti-Indian organisation, Jamaat-ud-Dawa (JuD) is has tried to stir anti-India emotions within the general population. JuD's publication *Jarrar*, as well as two other 'jihadi' publications have highlighted the issue of "water terrorism". They have continuously devoted a section of their publication to Indo-Pakistani water disputation, warning the Pakistani population of the need for a "jihad" against India. Additionally, JuD has held public rallies to deliver anti-Indian presentations on water issues across Pakistan. Militant leaders are painting a picture that the two neighbours are about to resort to war over access to water, and that Pakistan is undergoing desertification because of India cutting its water sources in violation of the IWT.

In India the spin on trans-boundary water issues is mainly controlled by the Foreign Office. The narrative is that a drop in water flow going into Pakistan is not a consequence of Indian abuse of the IWT or any other action on its part to divert water flow or to take more than was assigned to India from the western rivers. Additionally, the Foreign Office asserts that changes, more specifically decreases in river flow, are also due to the global pattern of melting glaciers and climate change (The Hindu, 2010). On top of this, Indian media claim that their neighbour's water troubles are attributable to "mismanagement of water resources", "less storage facilities" and a "huge 38 MAF of waters flowing every year un-utilised" (The Hindu, 2010). In line with this narrative, India contends that Punjab Province's extraction of more than its fair share of in-country Indus linked water vis a vis Sindh and Balochistan is at the root of Pakistan's dissatisfaction with the amount of river flowing into Pakistan from India (Haider, 2014).

The Indian perception was shaped by High Commissioner to Pakistan Sharat Sabharwal from 2009-2013. He spoke of accusations against India despite claiming that India had never meddled with water flowing into Pakistan, not even throughout the 1965 and 1971 wars. As the Treaty allows limited use of water from the western rivers of the Indus system by India, he suggested that "apprehensions, misconceptions, misinformation and allegations pertaining to India …characterize the debate on water scarcity in Pakistan" (The Hindu, 2010) and claimed that India had not taken advantage of this right to date. Regarding the storage allowance of 3.6 MAF, India had yet to build its own storage. From the 1.34 million acres gaining permission to be irrigated, just 0,792 million acres were irrigated (Akhtar 2010). With a mighty prospective of 18,653 MW, developments worth 2,324 MW were

commissioned and others for 659 MW were under construction (Akhtar 2010). High Commissioner Sabharwal claimed New Delhi maintained no storage and diversio waterways to store in secrecy Pakistan's cut of water and that all such claims were baseless (The News, 2010). He encouraged Pakistan to develop improved water storage and management facilities in light of increasing water scarcity, in line with Indian media claims that Pakistani water infrastructure was in need of renewal and that 30% of total water from canal heads to farms was lost.

Sabhawal's claims were echoed by the Indian media. A story published by *The Tribune* suggested that Pakistan was attempting to distract public criticism of water mismanagement, which lay at the heart of water shortages (Menon, 2009). Indian media also wrote that Pakistan behaved like a spoilt child, delaying work to complete India's projects. Pakistan has questioned an approximate 27 developments by India on the western rivers (Kumar, 2011).

The International Centre of Peace Initiatives foresees water as the source for future arguments among India and Pakistan. As idealistic as the Treaty is, it can only offer a fragile defence against intensified dispute, and that it is merely a question of when, not if before full-scale water war will be an inescapable character of the area's political environment (Waslekar, 2005).

Its strategic location astride the Indus Basin has ensured that fresh water is also a contributing factor to acute bilateral tension over Kashmir. And within Indian Held Kashmir (IHK), there are dissenting opinions to New Delhi in response to having "surrendered the state's water rights to Pakistan" (The Express Tribune, 2012) under IWT. The prevailing view in IHK is that the three rivers flowing in its territory have been given up to Pakistan as the rights over the rivers passing through Indian Punjab have been recalled. In response to this view, New Delhi has been asked by IHK to reconsider the IWT so that the interests of the state are sheltered (The Express Tribune, 2012).

Over the past decade, doubts have increasingly emerged regarding the adequacy of the IWT. In 2001, following an attack of violence by non-state actors on the Indian Parliament allegedly launched from within Pakistan, India openly expressed that it was considering pulling out of the Treaty to punish Pakistan for its apparent backing of terrorists engaged against India. In response, Pakistan announced that it was ready to deploy nuclear weapons

over the next water crisis. There are additional reports that among other retaliatory actions, India has previously considered stopping water from flowing into Pakistan: nullifying the IWT. Ultimately, India did not pursue this course of action as Foreign Office Legal Entity Division assessed it was not possible to repeal the IWT without Pakistan's agreement due to its being guaranteed by the World Bank.

Following the Mumbai attacks in 2008, India again threatened to abandon the Treaty. While possibly just an empty threat towards Pakistan to reawaken water fears, acting on such a threat would perhaps be the most damaging act India could take against Pakistan; i.e. withdrawing from the IWT. Were India to nullify the Treaty, the collapse of the agreement would without doubt prompt serious water shortage problems for Pakistan. India would have the upper-riparian advantage to divert and use unlimited Indus waters that are denied it due to the Treaty provisions favouring Pakistan.

In his article published in *The Tribune* cited earlier, M.S. Menon added that India would be justified in withdrawing from the Treaty in response to Pakistan's non-compliance with UN Security Council Resolution 1373 on denial of sanctuaries and support to terrorists. (Menon, 2009)

Retired Lt-Gen Ranjit Singh of the Indian Army and influential Indian commentator was in favour of India's withdrawal from the IWT, viewing such a step as lever that India should use to apply pressure on its neighbour to desist from deploying militant groups against India. (Menon, 2009)

Given these sentiments, it is possible that water will be more frequently used as a tactical tool by India in its dealings with with Pakistan. India's increasing bargaining position will result in Pakistan becoming more vulnerable, and India will be in the position to dictate future trade-offs.

6 Treaty Structure

In order to argue the need to update the IWT, it is necessary to analyse the text of the IWT to detect its key weaknesses. The Agreement on the Cooperation for Sustainable Development of the Mekong River Basin (Mekong Agreement) and the International Commission for the Protection of the Danube River (Danube Convention) shall be used as comparison trans-boundary agreements. In doing so we will take into account the political, historical and economic differences between the riparians in question.

The reason the Mekong Agreement and the Danube Convention have been selected as measures of comparison, is their to-date success in ensuring regional peace and cooperation as well as managing their shared fresh water resources so well.

6.1 Key Differences

The key difference between the Danube and Mekong arrangements relates to dispute resolution. The IWT has no permanent secretariat, and in the absence of this arms-length consultation mechanism layer, disputes that could reasonably be expected to be resolved at a technical experts level are elevated to a Court of Arbitration where political and national prestige considerations come into play. A further difference between the two comparison arrangements and the IWT is the enforceability of arbitration decisions. The decisions of the International Court of Justice and Mekong International Dispute Settlement must be executed while decisions of the IWT Court of Arbitration are not legally binding and hence not enforceable (Akhtar 2010).

The Mekong Agreement and Danube Convention however each have a permanent Secretariat which is positioned at arm's–length away. Such a structure has been put into place so that at times of disputes, the Secretariats are just an arm's length away. When such occurrences arise, the Mekong Agreement and Danube Convention provide technical experts on a separate level of technicality and a neutral secretariat resolves issues before these are elevated

to a full blown international dispute settlement involving recourse to the International Court of Justice. While it is essential to have this as an ultimate recourse, it is a lengthy and expensive process which, despite the neutrality of the judges, also risks elevating political tensions between the claimants over the issues being adjudicated on. For good reason, the Danube Convention makes use of the International Court of Justice (ICJ) but only as the last resort to settle a dispute.

In addition, it is important to keep in mind that due to the tumultuous history between the riparians and the severe mistrust they continue to show today, once the Treaty enters into dispute settlement resolution, it brings to the fore other sensitive issues between the riparians. This is a key difficulty faced by the IWT in terms of dispute resolution, since once the Permanent Court of Arbitration (PCA) is called for, it becomes almost impossible to separate politics from the technical issues at hand. Technical issues inevitably turn political, which become very ugly very fast (Shaohui, 2016).

6.2 Indus Water Treaty

Following almost 10 years of negotiations, the IWT finally entered into force in 1960. In comparison to the Danube and Mekong arrangements, the IWT structure is quite simple. This may be due to the IWT being a bilateral agreement rather than a multilateral one, as the other two agreements in question are. The IWT is a mechanism to encourage cooperation and the peaceful exchange of information between India and Pakistan. This exchange of information is performed via the Permanent Indus Commission, which regulates the use of rivers and has a commission from both nations. The Treaty is straightforward in its approach to handing issues. ""Questions" are taken care of by the Commission, "differences" are handled by a Neutral Expert and "disputes" are resolved by an arbitral tribunal otherwise known as the Court of Arbitration" (World Bank 2017).

The Indus Water Treaty structure and governance mechanisms are less comprehensive compared to the Mekong and Danube arrangements and as such less able to respond to the contemporary context without rapid escalation, fuelling or fuelled by bilateral tensions. A brief explanation as to why this is, is that during the many rounds of negotiations between the World Bank and the two states, the Bank would have preferred for either side to put forward

a plan agreed to by both states. However as such a plan never secured agreement, the Bank proposed a plan it believed would form the basis of discussions both as a platform for attracting financial assistance from other governments, and as a basis for elaboration into a more comprehensive bilateral agreement complete with multilayered consultation and dispute resolution mechanisms.

For the purpose of mutual cooperation, the riparians exchange information and data related to water quality and find common ground on issues within the framework of the IWT. The Permanent Indus Commission, a bilateral commission, was established with a Commissioner from both countries. The Commission follows a set procedure for umpiring disputes over the allocation of water. Thus far, the Commission has endured through three wars over six decades and continues to provide a support system for conflict resolution and peaceful negotiations via an exchange of information and inspection. In compliance with the Treaty, the Commission is to meet on a regular basis to discuss areas where high levels of sensitivity still occur in order to try avoid further disputes. If either party wishes to develop any type of engineering work which might have an impact on the other riparian, a notification must be sent to the neighbour with details on the works. A Neutral Expert is sought during times of disagreement to meditate and arbitrate the situation. Should the neutral expert fail to resolve the issue(s) to the satisfaction of the two parties, the only available next recourse for resolving disagreement, is arbitration. Disagreement over selection of a neutral expert can itself lead directly to a demand by either party to invoke the only other IWT arbitration mechanism available. Moreover, as we will see below, the arbitration mechanism under the IWT is itself weak. India considers that the dispute resolution process for every project proposed should not be a Neutral Expert, as this mechanism delays the projects, resulting in further expenses needing payment, effectively costing more in the construction of projects, and wasting hydro potential (Chandran, 2010).

6.3 Mekong River Agreement

The Mekong River Agreement encompasses regional cooperation between Laos, Cambodia, Thailand and Vietnam. This collaboration began in 1957 when the Mekong Committee was created under a decree sanctioned by the United Nations (International Waters Governance, 2017). The Mekong River Commission (MRC) was then created to manage everything from

water quality to disputes between the four riparians. During its establishment, it was the biggest UN project to be accepted, as no other international body had endeavoured to take on such a responsibility for financing and managing water resources.

Figure 3: The Mekong River Basin
(Source: The South East Asian Water and Power Alliance, *Mekong River Basin*, London, 2017)

In 1995, the four riparians finalized the Agreement on Cooperation for Sustainable Development of the Mekong River Basin (the Mekong Agreement). There are five procedures under which the countries share data regarding water use. The procedures are vital to determine how the states develop and manage the Mekong River resources, as their economies continue to integrate in the 21st Century. Representatives of the four states have

yearly meetings to discuss developing issues relating to the Mekong Basin. Being Council Members of the MRC, they assemble to review conclusions regarding the management of water resources within the 1995 Mekong Agreement. The MRC joint Committee moves policies forward. The Committee meets twice yearly and comes back to the Council, functioning as the Board of Management. The operational arm of the organisation is the MRC Secretariat, as it executes technical as well as administrative roles under a Chief Executive Officer. It organises meetings for the Member States and delivers technical guidance on planning, coordinating and cooperating as a joint body.

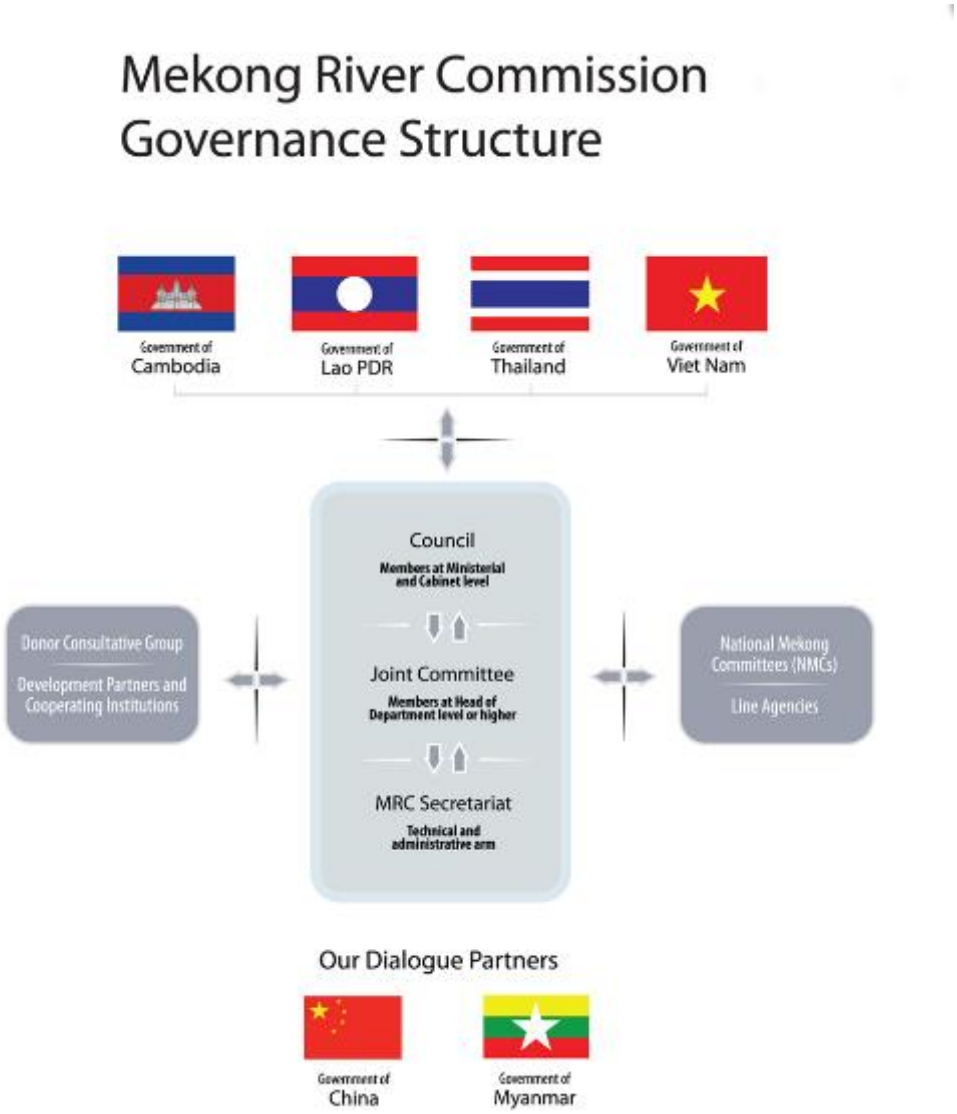

Figure 4: MRC Structure
(Source: Mekong River Commission, *Governance and Organisational Structure,* Vientiane, Laos, 2017)

As of 2030, the Secretariat of the MRC will be financially sustained by the Member Countries (Mekong River Commission 2017). The Member States have also approached the MRC to seek methods for financing and some responsibilities to come from the veto of Members.

The MRC has three key functions: secretariat, administrative and management functions, core river basin management functions and consulting and advisory services. For the purpose of this thesis, the second and third functions will be discussed. Management of the Basin is split into the following areas a) data procurement, interchange and observing, b) analysis and modelling, c) planning support, d) forecasting and emergency, e) implementation of the MRC Procedures (Mekong River Commission, 2017). Management of the Basin is the core technical part of the MRC under planning, environmental management and technical support divisions. The third function, consulting and advisory services includes the provision of technical expertise, databases and models. (Mekong River Commission, 2017)

Figure 5: MRC Secretariat Structure
(Source: Mekong River Commission, *Mekong River Commission Secretariat Structure,* Vientiane, Laos, 2017)

6.4 Danube River Convention

The International Commission for the Protection of the Danube River is in charge of all legal operations for collaboration on trans-boundary water issues in the Danube River Basin. The Convention was signed in 1994 and entered into force in 1998 (International Commission for

the Protection of the Danube River, 2017). The purpose of the Convention is to safeguard that surface and groundwater within the Danube River Basin are managed and used sustainably. (International Commission for the Protection of the Danube River, 2017)

The Convention encompasses eleven states – Austria, Bulgaria, Croatia, the Czech Republic, Germany, Hungary, Moldova, Romania, Slovakia, Slovenia and Ukraine and has been ratified by the European Union (International Commission for the Protection of the Danube River, 2017).

Figure 6: Danube River Basin
(Source: International Commission for the Protection of the Danube River, *Danube River Basin*, Vienna, 2011

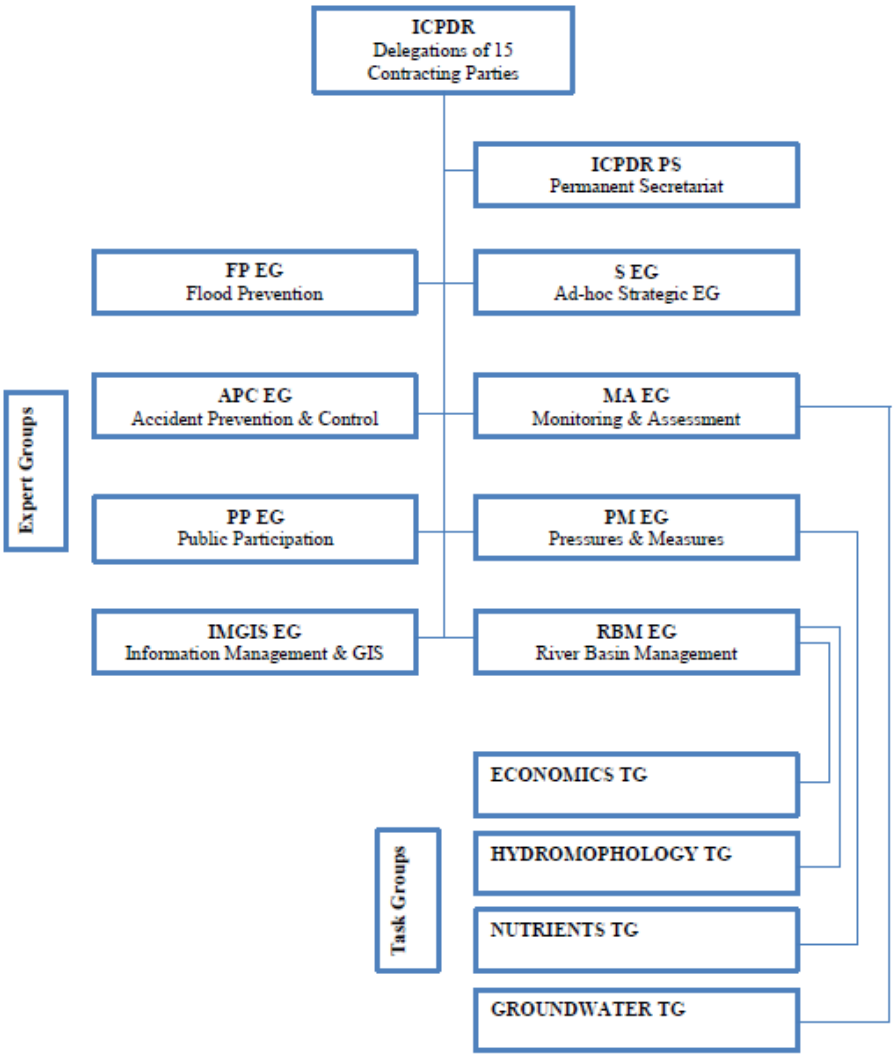

Figure 7: Organogram of the International Commission for the Protection of the Danube River (ICPDR) (Source: Own depiction after: ICPDR, (na)" Organogram of the International Commission for the Protection of the Danube River (ICPDR)" Accessed September 8, 2017. https://www.icpdr.org/flowpaper/viewer/default/files/nodes/documents/icpdr-organigram.pdf.)

The eight Expert Groups of the Danube Convention are the key to its success. The Expert Groups are comprised by experts from each member state as well as from the Convention observer organisations. The Expert Groups examine and make recommendations to resolve problems arising between member states. Technical work mostly relies on these Expert Groups, whose specializations are integral to the success of the ICPDR. During plenary meetings, Expert Groups put forward verdicts to the Commission (International Commission for the Protection of the Danube River, 2017).

The Expert Groups meet independently twice yearly and their work is reinforced by Technical Experts from the ICPDR Permanent Secretariat. The Expert Groups are vital to the ICPDR 's successful operation, as it permits the ICPDR to work in a de-centralised way,

facilitated by the Expert Groups who take care of the technical decisions. The ICPDR Secretariat encourages the work of the Expert Groups, aids project development and maintains the ICPDR information centre. The Secretariat's duties include general management and supervisory functions. The impromptu Expert Group addresses legal matters coming from implementation of the Convention. It is also necessary to note the legal status of the three documents in question.

7 Gaps

7.1 Dispute Resolution

The first gap in the IWT to be examined concerns dispute resolution. The Treaty has set forward a distinct set of procedures to handle upcoming issues that arise: "questions" are taken care of by the Commission; "differences" are handled by a Neutral Expert; and "disputes" are to be resolved by a seven-member arbitral tribunal called the "Court of Arbitration." (World Bank, 2017)

As can be seen from Paragraph 1 of Article IX, Settlement of Differences and Disputes in the IWT of 1960 (see Annex 1) (World Bank, 1960), as soon as any issue or question arises, the first to examine the scope of the situation is the Commission (see Annex 2) (World Bank, 1960).

The Mekong Agreement on the other hand provides technical experts on a separate level of technicality and a neutral secretariat in order to resolve issues before they are elevated to full international dispute settlement. The Mekong Agreement of 1995 has a different mechanism to resolve disputes as can be seen in Annex 3 (Mekong River Commission, 1995).

Lastly, the Danube Convention of 1994 has a mechanism most similar to the one of the IWT. The crucial dissimilarity between them is that while the IWT's final measure is enlisting the Court of Arbitration, the Danube Convention turns towards to Court of Justice (see Annex 4) (International Commission for the Protection of the Danube River, 1998).
The difference between turning to the PCA and the ICJ may not seem significant to most, however upon closer inspection there are considerable differences. The most important ones

to be discussed for the purpose of this thesis are that firstly, the PCA is not outranked by the United Nations.

The PCA's status is lower to that of countries, as according to the PCA, arbitration should obey states' will. Its process of settlement does not belong to any part of the international judicial system. The settlement from the PCA may have some juridical validity, however it does not compare to that of the ICJ in terms of legal force. For this reason, the PCA is not an ideal instrument for to dispute settlement, and is thus not a favoured arbitration mechanism for more recent international agreements.

On the other hand, when a state puts forward their disagreements to the ICJ, the settlement of the ICJ must be followed through. In terms of payments made towards the organizations, the PCA's fee for arbitration are covered by those states in the arbitration, while all fees in the ICJ are taken care of by the UN.

The impact this difference has on dispute resolution and whether the parties truly work towards a mutual settlement is substantial. As the IWT employs a PCA, neither of the two parties are under a legal obligation to fulfil its rulings. It is worth reflecting whether the choice of employing the PCA over the ICJ was done with the purpose of being able to reject its rulings whenever it suits either side of the dispute. This being said, the choice of engaging with the PCA could be viewed as having been employed, cynically, for the purpose of creating an image of working towards peace. The reason the author believes this, owes to the PCA being an organisation in which the members of the panel are ones chosen by both sides of the dispute, instead of being appointed by the UN. This has significant impacts on the final outcome of the PCA (if the members are able to come to an agreement being chosen by both States) as depending on how many members support which side of the dispute, the ruling will support one or the other. Additionally, either side or both parties are permitted to overlook the ruling of the PCA. As an ad hoc arbitration is the creation of a compromise agreement between parties, its existence depends upon reaching some sort of agreement. A settlement must be made nonetheless. This is the bottom line for the functioning of the IWT, for unless a settlement is reached, the situation can lead to a worsening of the already fraught relations among the riparians, with the ever present prospect of an outbreak of hostilities. An improved governance and strengthened dispute settlement process would greatly assist the smooth functioning of the IWT.

An exit mechanism to pull out from the Treaty does not explicitly exist in the IWT. On the other hand, withdrawal from the Mekong Agreement can be achieved reasonably easily by providing a transcribed announcement to the Chairman of the Council of the MRC. The notice is communicated to the other parties. Withdrawal will take place one year after acknowledgement. Unless jointly agreed by the other members to the Agreement, the notice will not be detrimental to, nor dismiss the leaving Member of obligations entered into concerning programs, or under international law. Similarly, the Danube Convention states that a Member is able to remove itself from the Convention via written notification five years after the Convention has been ratified with the respective party. The withdrawal will be put into effect one year following the receipt of the notification. Of course both the Danube Convention and Mekong Agreement are multistate agreements so, unlike the IWT, withdrawal from either agreement by a member state would not be terminal for the actual agreement.

As a “"Treaty" the IWT constitutes an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation” (United Nations, 1969). However, “an agreement is made when two parties reach an understanding about a particular issue, including their obligations, duties and rights. While agreement is sometimes used to mean contract… it is actually a broader term, including understandings that might not rise to the level of a legally binding contract” (Black’s Law Dictionary, 2011).

The Mekong Agreement thus enjoys the rank of an international body, while the Commission assumes all responsibilities of the Committee for the coordination of investigations of the Mekong Basin and Mekong Secretariat. Lastly, a “convention between parties is a shared commitment encompassing all the basics of a contract, but did not lead to an action, nor did it get the authorization of the law, as bearing an “obligation” until the objective requisite of a solemn ceremonial (such as stipulatio) was supplied.” (Black’s Law Dictionary, 2011). In other words, a convention is an informal agreement of the parties which forms the base and beginning of a contract and which became a contract when the external formalities were superimposed (International Commission for the Protection of the Danube River, 2017).
To enforce the Convention’s objectives, the International Commission for the Protection of the Danube River (ICPDR) was created by the Danube River Protection Convention (DRPC,

1994). The structure of the Commission has been laid out in Article 18 and Annex IV of the DRPC. The ICPDR's mandate is articulated in its Statute, enabling it to fulfil its obligations and duties in conformity with the laws of its Secretariat headquarters' host country. The ICPDR must have enough legal ability to "(a) to contract; (b) to acquire and dispose of immovable and movable property; (c) to institute or respond to legal proceedings; and (d) to take such other action as may be necessary or useful for its purposes and activities." (International Waters Governance, 2017)

Ever since it came into existence, critics of the MRC have objected to it on the basis of Member States having no legally-binding power over the Commission. Another criticism is that the MRC fails to provide veto power to lower lying riparians states over developments occurring upstream. And there remains no legal instrument to discipline Member States that fail to comply with the MRC's principles. Additionally, the fact that China continues to get away with not becoming a full member of the MRC challenges the power of the organisation. The last condition of the IWT required the formation of the Indus Commission, which implemented two dispute resolution processes. One was to be a resolution process with a neutral, third-party and the other was to be an arbitration process. For example, a dispute arose in 1980 about India's project for the Wuller Barrage on the Jhelum River. Pakistan protested this claiming that it abused the Treaty. The case was passed onto the Commission; however it was unsuccessful in finding a resolution to the dispute and the plan was ultimately suspended. Then in 2005, the World Bank was called to resolve a dispute surrounding the Baglihar hydropower project by India. The talks once again had failed and have yet to be resolved (Wolf and Newton 2008).

The IWT dispute resolution mechanism has been sufficient so far, but it is imperfect. Shafqat Kakakhel, former Deputy Executive Director of the United Nations Environment Programme, highlights the concerns with the dispute resolution system. While arbitration is less expensive and time consuming than traditional judicial forums, it still costs substantial time and money. Kakakhel states that the role of the IWT Commission was envisioned to be far more operational, however in reality it has fallen short of such expectations. Instead, disputes have gone straight to the Court of Arbitration, with attendant financial cost (Siddiqui 2015). Finally, the Indus Commission has not lived up to its full potential, as the objective of the Commission is to build development on the Indus system, but "since 1960, no projects have been submitted under the provisions of 'future cooperation'" (Wolf and Newton 2008).

7.2 Climate Change and Environment Issues

The IWT is under severe stress from both neighbours due to increasing water scarcity. It must be acknowledged that the Treaty was drafted and signed as a temporary water-sharing solution at a time when the Indus system had a larger quantity of water. Water insecurity is increasingly being brought to light due to the climate changes that can be observed in a variety of ways, resulting in further politicization of the Indus.

The only section of the IWT where reference to the environment can be found is in Article IV Part 10 (see Annex 5) (World Bank, 1960).

There is however, no reference in the IWT to climate change. In order to manage the future impacts of climate change, India and Pakistan must develop a mutual water vision which is based on the understanding of the critical importance of the water resources that will be part of their survival. Were the two states to converge in their appreciation of this, new and creative capacities in and out of the Treaty can be envisioned. "Water should be an instrument of peace — a means to achieve human security rather than a source of discord." (World Water Council, 2009)

In regard to climate change, the only place where the IWT could potentially be revised to adapt itself to the changes brought by climate change is in Article XII under Final Provisions, paragraph 3 (see Annex 6) (World Bank, 1960).

Admittedly, the 1995 Mekong Agreement similarly lacks any reference to climate change, solely providing Article 37 on Amendments, Modification, Supersession and Termination (see Annex 7) (Mekong River Commission, 1995). Despite this, the awareness of climate change among Mekong riparians and in the MRC has grown, leading to a Basin Development Strategy focusing on water resource management, agriculture, and natural disaster management.

The 1994 Danube Convention also lacks any explicit reference to climate change. After it was signed, however, the International Commission for the Protection of the Danube River has created a Strategy on Adaptation to Climate Change.

The IWT has managed to survive without being abandoned by either country thus far. However, changing conditions will challenge its capacity to govern water cooperation between the neighbours in the future. Though it has endured three wars, its failure to consider problems relating to climate change represents a further serious challenge to the Treaty's future. Climate change mitigations must have a higher priority because climate change is likely to alter the flow and quality of water, creating further scarcity and stoking political tensions.

Unlike the Indus and Mekong arrangements, when it comes to communications and commerce the Danube Convention is vital for regulating trans-boundary transport and international trade, whereas the Mekong and Indus are used more for domestic transport and local trade. The significance of the Danube for international trade is as a communication corridor between the Danube states. This highlights the need for constant order and cooperation among the Danube states, together with cleanliness and waste control. The importance of an environmentally sustainable Danube to the regional economy and large number of stakeholders incentivises cooperation and dispute resolution among Convention members, conversely acting as a check on unilateral behaviour inconsistent with the Convention. Consistent with these considerations, of the three agreements, the Danube Convention is best equipped to promote cooperation and mitigation measures among its members.

In order to achieve and manage a clean Danube, Part 2, or Best Environmental Practice in Annex 1 of the Danube Convention provides environmental protection measures such as (see Annex 8) (International Commission for the Protection of the Danube River, 1994).

In addition to Part 2 of Annex 1, the Danube Convention further supplies general guidance on water quality criteria and a list of hazardous substances harmful to the environment.

While less comprehensive than the visionary Danube Convention, the relative to the IWT more youthful 1995 Mekong Agreement does also include environment-specific articles. For example, Article 3: Protection of the Environment and Ecological Balance (see Annex 9) (Mekong River Commission, 1995). Additionally, Article 7: Prevention and Cessation of

Harmful Effects of the Mekong Agreement, could be a site for potential revamping in respect of climate change (see Annex 10) (Mekong River Commission, 1995).

7.3 The lack of Chinese implementation

The powerful position China holds as an upstream nation to undermine downstream nations and shape their cooperation in conformity with China's interests is clear in the IWT, as its geographical position and length plays an impactful role, especially in the area of damming. In the current situation, China can play the role of a looming cloud, patiently waiting for the IWT to collapse as a result of failed dispute resolution or a fourth war.

The Mekong Agreement has successfully managed to keep China cooperatively engaged by its having signed on as a Dialogue Partner. Despite its non-member "partner' status, China has steadily escalated its unsolicited participation in various Mekong Agreement forums. A key area however where China has remained discreet is in providing updated data on the operations of its dams. Another area where China has played an impactful role relates to its influential relationships with Laos and Cambodia, which has seen these small and comparatively weak states against the other two members of the Mekong Agreement, causing a series of disagreements. (Foreign Policy, 2016)

Within the Indus Water Treaty, China could very easily have an impactful role on the upper waters (drawing conclusions from its behaviour towards the Mekong Agreement), however so far China has not seen its national interests served by engaging with the IWT or otherwise taking the opportunity to exploit the waters to its own advantage at the expense of India and Pakistan. Were China to begin picking at the IWT, there is a distinct possibility that India and Pakistan would be left with a weaker treaty.

In response to the geo-strategic steps taken by China, the Mekong Agreement has drawn it into a consultative arrangement on the management of the upper Mekong which has acted as a restraint. It is important to ask however; is this arrangement still functioning sufficiently well to restrain China or is it ignoring the fact that China is exercising influence over Laos and Cambodia despite negative impacts for them, as they are client states of China.

As Pakistan has warned India that it would to do so in the past, were India to want to punish Pakistan by pulling out of the Treaty, it could start a domino effect, provoking China, Pakistan's "all weather friend". China's non-inclusion in any binding legal framework in respect of the Indus, worries India as it could at any moment put together dams which would cut India off from significant quantities of water. This is a real possibility, whether for economic or retaliatory purposes. India's upgrading of its defences in its state bordering China has been claimed by Beijing as leaving China feeling challenged. If this were to happen, India would feel the consequences in the agricultural north-eastern state of Assam. China could otherwise punish India by building dams across the Indus, limiting water flow into India. However as this would also impact Pakistan, leading to disastrous consequences, it is a less likely scenario.

8. Discussion of Research Outcomes

Water availability can be used as strategic and political leverage over and within water scarce countries. A change in water supply can mean a change in national security, given its existential importance to life, the environment and economic production. A state may feel threatened if forced or obligated by treaty to share water proportionately with a neighbour because this eliminates the possibility of extracting more water from a shared resource, not only for one's own expanding needs, but potentially also thus amassing more power.

In answering the first objective, which was to examine the current IWT and pinpoint in what areas it is failing India and Pakistan as a water-sharing Treaty, the author considers the Treaty is experiencing stress due to growing bilateral competition arising from worsening water scarcity. Compounding the consequences of each country's desire for development purposes to harness water for energy generation and to increase agricultural and industrial production, is their continued high population growth, leading to intense competition over who can threaten the other more. Emerging concerns about ecological threats to the Indus Basin rivers system as climate change impacts on water security are becoming impossible to ignore, which has led to a powerful water debate between India and Pakistan.

The Indus Water Treaty was intended as an equitable and proportionate water sharing governance mechanism, but is now showing signs of aging. This thesis has set out the reasons why the IWT is no longer adequate, or fit for purpose.

These debates are symptomatic of the growing politicisation of water sharing issues between the two countries, which is putting additional stress upon the IWT. The simmering bilateral tensions over the political status of Kashmir, Indian accusations against Pakistan over support for or failure to prevent militant extremists from attacking India over the Line of Control which divides Kashmir between the two countries (culminating in current Indian Prime Minister Modi describing Pakistan in late 2016 as "the mother ship of terrorism" (Mahapatra and Jacob, 2016) are the more dangerous because both countries are nuclear weapon states. The flashpoint of Kashmir also straddles a key part of the Indus Basin and is a central factor underlying that intractable source of mutual enmity. While the IWT has already withstood

wars between the two neighbours, control over Indus Basin waters are of themselves now a potential flashpoint.

India's projects to further hydropower development on the Chenab and Jhelum rivers are overlapping with increasing water stress in Pakistan. Pakistan's ill feelings towards India are fuelled by numerous grievances, and India not sharing data and technical details on their projects has fed Pakistan's distrust towards India. The worst thing that could happen for Pakistan is for India the stop the flow of water during the dry seasons. This possibility has pushed the neighbours further apart and forced water to become one of the top points of dissension a key feature of present and future of Pakistani-Indian relations.

Challenging the Indus Water Commission are upcoming Indian projects. Such issues did not exist at the time of the Treat's inception, thus the Treaty is unable to cope. The Neutral Experts' conclusion on the Baglihar verdict re-explained the Treaty in the light of "new technical norms and new standards" and "best and latest practices in the field of construction and operation" (Akhtar, 2010). The conclusion provides a basis to augment the Treaty so that it can adjust to new issues of the Indus Basin. This includes new technical norms as well as the increasing pressures upon a healthy Indus Basin. It is also important to discuss the absence of a permanent Secretariat similar to what the Mekong and Danube have established, so as to avoid frequent escalation to the highest dispute body and risk of constant politicisation.

Answering the second objective, which was to draw a comparison between the IWT and the Mekong Agreement as well as the Danube Convention in order to establish their differences and potentially see what the IWT is missing, exposed the lack of a permanent Secretariat compared to the Mekong Agreement and Danube Convention as an issue that needs addressing. In the absence of such a standing, neutral, expert body there are overly-frequent escalations to the highest dispute forum with the attendant risk of constant politicization of water issues between these two countries whose bilateral relations are already under constant stress from a range of seemingly irreconcilable disputes. Research also exposed the absence in the IWT of sufficiently comprehensive provisions to require or promote cooperation on contemporary, and emerging environmental management and climate change prevention/mitigation challenges. Both the Mekong and Danube agreements are better equipped in this regard.

Climate change and other environmental challenges and development pressures cited earlier demand a mutual water visualization by the neighbouring riparians which will force them to understand the existential importance of the river basin they share and as a key to their mutual future success. "Water should be an instrument of peace — a means to achieve human security rather than a source of discord." (World Water Council, 2009)

Either party may, however, prefer to retain the IWT in its current form as it provides freedom to develop infrastructure on a unilateral basis; whereas if they have to seek the other party's agreement rather than simply inform of infrastructure project plans, then the development of new infrastructure may suffer or be delayed.

Uncertainty of the future state of the waterways is an intimidating thought. Since the effects of climate change cannot be known, it is almost impossible to know how successful the preventative measures taken to adapt to climate change will be.

Integrated water resource management and climate change adaptation have gained popularity on the international policy agenda, including the UN Roundtable on Water Security, the World Economic Forum, and the UNECE Water Convention Meeting of the Parties (Wouters and Tarlock, 2009). The Organisation of Economic Cooperation and Development (OECD) has reported on "the need for improved governance and policy coherence" (Wouters and Tarlock, 2009) for water reform. Effective cooperation relies on effective governance and well-functioning institutions. Without it, these reforms are prone to social and economic corruption. The Director General of the World Trade Organisation has echoed this sentiment, emphasizing that "global governance must be anchored in laws and regulations accompanied and support from international water law warrants an exploration of the concept of obligations erga omnes, the duty of the States to cooperate on peaceful management" (Wouters and Tarlock, 2009). It not only warrants a legal focus but also a global community focus to manage environmental resources.

Research for this thesis has exposed a lack of engagement of China, and absence of an Indus Basin strategic plan which would assist long term planning for both countries and buttress the Treaty as part of regional governance arrangements for sustainable development and economic growth, harnessing the water and energy resource of the Indus. As such its

importance as a bilateral confidence building measure would be augmented, and as a significant element of regional peace and security and sustainable development.

China needs to be encouraged to take a proactive role and engage in the sustainable future and cooperative exploitation of the Indus Basin's water and water derived energy resources in a timely manner. A possibility could be for China to sign onto the IWT as a Dialogue Partner as it has done with the Mekong Agreement. The basis for this step is the major stake China has in regional stability linked to its own national economic and strategic interests. China is openly upping its regional engagement, as evidenced by the Belt and Road Initiative (BRI) and the flagship BRI pilot - the China-Pakistan Economic Corridor (CPEC) involving some USD60 billion investment in Pakistan. CPEC is prioritising energy and road infrastructure, including in areas disputed by India where Indus is a key water resource and potential source of local and national energy and economic development for Pakistan. To stand aside from a cooperative, respectful posture to the IWT in a timely manner could have devastating impacts were China to extract Indus waters for itself, due to increasing effects from climate change on regional and national water levels as well as China's role in promoting or undermining cooperation between the two key Indus riparians.

Reflecting on the above outcomes it remains to consider how to rectify the weaknesses of the IWT. Three major contours stand out: the superior expert advisory and dispute resolution processes that are features of the two trans-boundary agreements used for comparison; the dynamic, interacting and urgent challenges in play for the future sustainable health of the Indus Basin, both environmental and climate change, linked to accompanying development challenges and ambitions of India and Pakistan; the outlook for protracted hostile bilateral relations accompanied by the broader, complex regional geopolitical and strategic landscape.
As has been documented above, the Treaty, and hence its utility as a bilateral confidence building measure is in an increasingly precarious position. If nothing is done, further political escalation, combined with the pressures on the Basin, will drive the Treaty to breaking point. This may lead to yet another war between the two riparians, with water being the spark for the outbreak of hostilities rather than a quencher, and the Treaty collateral damage rather than part of the solution. On the other hand, if the Treaty is unpicked with the purpose of strengthening it, either Party to the Treaty or even an interested and observant neighbour may step in during a time when the Treaty has been suspended, to make self-serving demands.

Answering the third objective, which was to propose a possible process or roadmap towards a new treaty, a recommended approach to boost the IWT's capacity to govern a sustainable future for the Indus Basin through mutual cooperation and to withstand being undermined by or used a tool for competing geo-political agendas, could be to develop a side-protocol or administrative agreement beside the Treaty, similar to what can be seen in the case of Mekong Agreement. Such a solution would avoid unpicking the current Treaty and risking its collapse, possibly triggering a regional disaster as a result. Such a side protocol would bring the IWT in line with the Mekong Commission and Danube Convention, with a standing body and/or a permanent secretariat of experts with a rhythm of meetings to discuss issues on a regular basis.

Currently, the IWT does not have such an arrangement. At this time it just has Commissioners. If a standing secretariat were to be introduced with international experts rather than nationals, this may help to de-politicize disputes so that issues can be worked out in a technical way, rather than becoming political. The task would be to establish a Standing Commission without unpicking the Treaty.

In order for the IWT to be equipped for the future governance of issues relating to climate change (this being a major gap in the current Treaty), additional Articles must be added, or current Articles must be amended to make the IWT fit for today's and emerging challenges. There is a need to elaborate governance arrangements for the two states parties' cooperation and respective actions they take in these areas. The IWT in its current form is deficient in both, and both countries are already severely vulnerable to climate change, Pakistan scoring within the top ten most climate change-affected countries globally, and climbing higher.

As a precautionary recommendation, the World Bank might replicate the ADB's initiative to bind China into a cooperative relationship with the IWT. Now is a good time to do this not only in terms of water sustainability challenges, but also because China wants regional stability in support of its own agenda. Conflict in the South Asian region, especially between the two major countries India and Pakistan would undermine China's national interests. China has invested heavily financially in its BRI initiative for regional and international connectivity. While BRI should contribute to this goal, and underpin improved regional stability, its success will also depend on a prevailing stable regional environment.

China's increasing regional and international engagement is also linked to its need for resources to fuel its economy. Regional countries, including Pakistan and Afghanistan, offer opportunities for China in regard to natural resources, while India is a potential major economic partner for China, despite their bilateral differences. Pakistan, as a close ally, is also offering China access to a strategically located port on the Indian Ocean at Gwardar. China's increasing stake in regional stability has also seen it commence a mediation effort between Pakistan and Afghanistan, and to call on both India and Pakistan to overcome their disputes, including over Kashmir, peacefully. China would likely wish to avoid being drawn in to any potentially 'kinetic' dispute with India on Pakistan's behalf, having its own border and other strategic competitive issues with India to manage. It is possible therefore that China will be open to becoming a constructive partner to the IWT, recognising the Treaty's important function in promoting sustainable water sharing/use and economic betterment, and thereby contributing to peaceful or at least stable relations between nuclear armed India and Pakistan.

A common water vision held by both India and Pakistan based on coming to terms with the upcoming effects brought on by climate change is the goal that both states must work towards. Recognition of the life source that the Indus is to both nations and the urgent need for its protection is the first step towards such a common vision. Once this first step is passed, new areas of cooperation and mutual planning can be imagined. A strategic economic plan for the protection of the Indus Basin, including linkage to the connected ground water resources, would not only be a helpful tool for national development, but would promote bilateral and regional cooperation for collective environment and economic benefit, and with the plan's attendant transparency buttressing mutual trust. It would serve as a much needed confidence building measure.

The Commission may feel hesitant about undertaking new responsibilities. A proactive approach is daunting and the parties may feel more comfortable remaining reactive. However, the author argues that change is possible because these suggested solutions all work within the structure of the IWT, not against it. The benefit of transforming the Commission into a neutral, expert faciliatory role is that it would not exempt the Commission of its original dispute resolution duties. It would merely extend the responsibilities of the Commission. That being said, it seems likely that both parties would have an easier time agreeing to adapt the scope of responsibility of the Commission than to agree to dissolve the

entirety of the Treaty or re-allocation of the waters. Additionally, changing the standards for the Commission also does not discredit the Treaty. The rights as stated in the Treaty would still be enforceable. For example, India would still have the right to the rivers allocated to it and Pakistan the right to its allocated rivers (Indus Waters Treaty, 1960). This can be presented as a reassuring incentive.

We also have an improved understanding today of how important it is to take care of the environment. The idea of environmental sustainability has gained popularity over the years due to the growth of environmental education in western countries, as well as the empirical evidence of human impacts on climate change. As the Paris COP 21 Conference showed (European Commission, 2016) increasingly, countries are investing in the future and taking the measures to ensure a healthy environment for future generations. The momentum of environmentalism can slingshot forward the idea of renegotiating the Indus Waters Treaty to adapt to climate change.

9. Conclusion

Despite its shortcomings, the IWT has served as an adequate instrument to defuse water disagreements between the two riparians for the past 60 years, however changing conditions are challenging its future success. It has survived persistently poor bilateral relations but it is not equipped to consider issues relating to upstream/downstream problems, pollution, population increase, supranational economic development or climate change. For all these reasons, the IWT must be re-examined to streamline its functioning, enhance its authority and preserve the wellbeing of the Indus Basin as a vital resource for today's and future generations.

As mentioned above, the Treaty is failing both nations in the areas of development of economic development, energy generation, high population growth and ecological threats as a consequence of climate change. The core differences are in their dispute resolution provisions, and the lack of a side protocol which leads to issues during dispute settlement. Lastly, to assist the IWT along its path towards modernisation, a permanent secretariat this would reduce both the risk of and escalation of differences from becoming formal disputes.
Climate change mitigation in the Indus Basin needs to be prioritized, within the riparians and cooperatively across their borders as it is expected to change the flow and quality of water, causing further water scarcity. The consequences of climate change will have effects on the environmental, social, and economic systems within both countries; moreover these effects are intensified in countries with a history of political conflict.

A more peaceful world is possible but it relies on global-level change. There needs to be a shift in the political and legal mindset of cooperation as a public duty. The author also hopes that the reader appreciates the impact climate change will have on trans-boundary agreements and that s/he will have gained an understanding of the importance of having treaties that respond to climate change, that promote the elaboration of common strategic economic plans based on environmental sustainability, and that feature robust governance and dispute settlement arrangements. The author encourages the reader to be critical of existing treaties and question their sustainability from each of these perspectives.

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List of Figures

Annex 1

Indus Water Treaty, Article IX Settlement of Differences and Disputes, Paragraph one

"(1) Any question which arises between the Parties concerning the interpretation or application of this Treaty or the existence of any fact which, if established, might constitute a breach of this Treaty shall first be examined by the Commission, which will endeavour to resolve the question by agreement."

Annex 2

Indus Water Treaty, Article IX, Settlement of Differences and Disputes, Paragraph 2

"(2) If the Commission does not reach agreement on any of the questions mentioned in Paragraph (1), then a difference will be deemed to have arisen, which shall be dealt with as follows:

(a) Any difference which, in the opinion of either Commissioner, falls within the provisions of Part 1 of Annexure F shall, at the request of either Commissioner, be dealt with by a Neutral Expert in accordance with the provisions of Part 2 of Annexure F;"

(b) If the difference does not come within the provisions of Paragraph (2) (a), or if a Neutral Expert, in accordance with the provisions of Paragraph 7 of Annexure F, has informed the Commission that, in his opinion, the difference, or a part thereof, should be treated as a dispute, then a dispute will be deemed to have arisen which shall be settled in accordance with the provisions of Paragraph (3), (4) and (5):

(5) A Court of Arbitration shall be established to resolve the dispute in the manner provided by Annexure G.

(a) upon agreement between the Parties to do so; or

(b) at the request of either Party, if, after negotiations have begun pursuant to Paragraph (4), in its opinion the dispute is not likely to be resolved by negotiation or mediation; or

(c) at the request of either Party, if, after the expiry of one month following receipt by other Government of the invitation referred to in the Paragraph (4), that part comes to the conclusion that the other Government is unduly delaying the negotiations."

Annex 3

Mekong Agreement, Chapter V; Addressing Differences and Disputes, Article 34; Resolution by Mekong River Commission

"Whenever any difference or dispute may arise between two or more parties to this Agreement regarding any matters covered by this Agreement and/or actions taken by the implementing organisation through its various bodies, particularly as to the interpretations of the Agreement and the legal rights of the parties, the Commission shall first make every effort to resolve the issue as provided in Articles 18.C and 24.F.

Article 35; Resolution by Governments

"In the event the Commission is unable to resolve the difference or dispute within a timely manner, the issue shall be referred to the Governments to take cognizance of the matter for resolution by negotiation through diplomatic channels within a timely manner, and may communicate their decision to the Council for further proceedings as may be necessary to carry out such decision. Should the Governments find it necessary or beneficial to facilitate the resolution of the matter, they may, by mutual agreement, request the assistance of mediation through an entity or party mutually agreed upon, and thereafter to proceed according to the principles of international law".

Annex 4

Danube Convention, Article 24; Settlement of Disputes

(1) If a dispute arises between two or more Contracting Parties about the interpretation or application of this Convention, they shall seek a solution by negotiation or by any other means of dispute settlement acceptable to the parties to the dispute, if appropriate with assistance by the International Commission.

(2) (a) If the parties to the dispute are not able to settle the dispute in accordance with paragraph 1 of this Article within a reasonable time, but not more than twelve months after the International Commission has been notified about the dispute by a party to the dispute, the dispute shall be submitted for compulsory decision to one of the following means of peaceful settlement:

– the International Court of Justice;

– arbitration in accordance with Annex V to this Convention.”

Annex 5

Indus Water Treaty, Article IV, Part 10

"Each Party declares its intention to prevent, as far as predictable, undue pollution of the water of the Rives which might affect adversely uses similar in nature to those to which the water were put on the Effective Date, and agrees to take all reasonable measure to ensure that, before any sewage or industrial waste is allowed to flow into the Rivers, it will be treated, where necessary, in such a manner as not materially to affect those uses: Provided that the criterion of reasonableness shall be the customary practice in similar situations on the Rivers."

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Annex 6

Indus Water Treaty, Article XII, Paragraph 3

"(3) The Provisions of this Treaty may from time to time be modified by a duly ratified treaty concluded for that purpose between the two Governments".

Annex 7

Mekong Agreement, Article 37

“This Agreement may be amended, modified, superseded or terminated by the mutual agreement of all parties hereto at the time of such action.”

Annex 8

Danube Convention, Part 2, Best Environmental Practice

"1. Best environmental practice means the application of the most appropriate combination of sectoral environmental control strategies and measures.

2. In determining what combination of measures constitute best environmental practice, in general or individual cases, particular consideration should be given to:

- The precautionary principle;

- The environmental hazard of the product and its production, use and ultimate disposal (principle of responsibility);

- The substitution by less polluting activities or substances and saving resources including energy (principle of minimising);

- The scale of use;

- The potential environmental benefit or penalty to substitute materials or activities;

- Advances and changes in scientific knowledge and understanding;

- Time limits for implementation;

- Social and economic implication.

3. It therefore follows that best environmental practice for a particular source of impacts will change with time in the light of technological advances, economic and social factors, as well as changes in scientific knowledge and understanding."

Annex 9

Mekong Agreement, Article 3

"To protect the environment, natural resources, aquatic life and conditions, and ecological balance of the Mekong River Basin from pollution or other harmful effects resulting from any development plans and uses of water and related resources in the Basin".

Annex 10

Mekong Agreement, Article 7

"To make every effort to avoid, minimize and mitigate harmful effects that might occur to the environment, especially the water quantity and quality, the aquatic (eco-system) conditions, and ecological balance of the river system, from the development and use of the Mekong River Basin water resources or discharge of wastes and return flows. Where one or more States is notified with proper and valid evidence that it is causing substantial damage to one or more riparians from the use of and/or discharge to water of the Mekong River, that State or States shall cease immediately the alleged cause of harm until such cause of harm is determined in accordance with Article 8.

Annex 11

Mekong Agreement, Article 8

“Where harmful effects cause substantial damage to one or more riparians from the use of and/or discharge to waters of the Mekong River by any riparian State, the party(ies) concerned shall determine all relative factors, the cause, extent of damage and responsibility for damages caused by that State in conformity with the principles of international law relating to state responsibility, and to address and resolve all issues, differences and disputes in an amicable and timely manner by peaceful means as provided in Articles 34 and 35 of this Agreement, and in conformity with the Charter of the United Nations.