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**APPLYING TWINS FRAMEWORK TO EXAMINE  
WATER SECURITY IN INDIA'S RELATIONS  
WITH PAKISTAN AND BANGLADESH**

**應用 TWINS 架構檢視印度-巴基斯坦與印度-孟加拉  
關係中的水資源安全**

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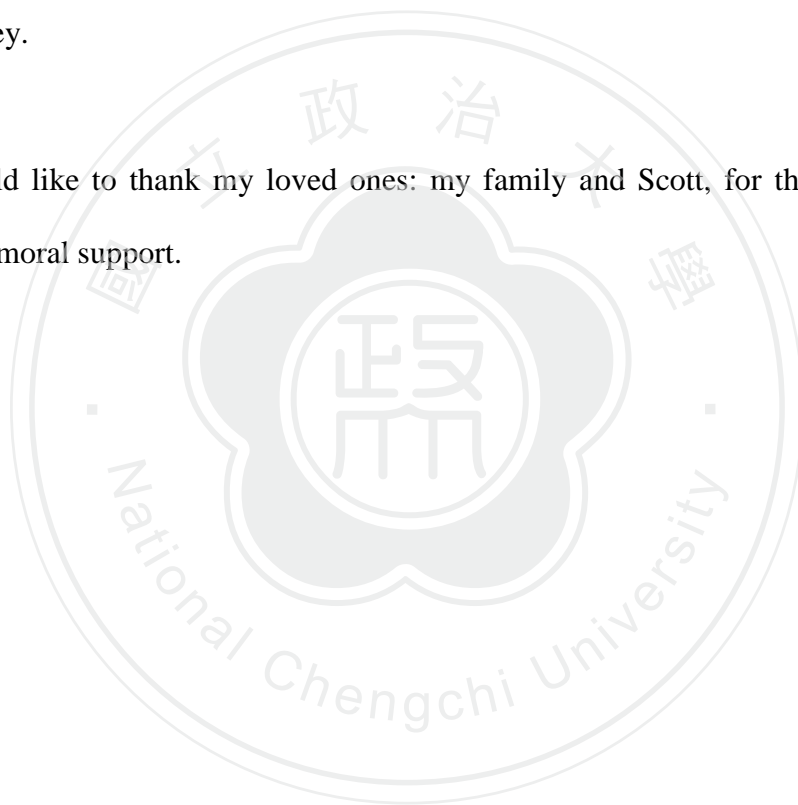
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## ABSTRACT

Water shortage has split the academic circles into two fractions: some claim states will go to war over depleting water resources, while supporters of institutionalism claim that a higher number of water treaties versus water conflict prove that water is predominantly a source of cooperation. The consensus in environmental security and conflict studies suggest that while it is more likely that water scarcity facilitates cooperation, the issue has the potential to multiply and exacerbate existing conflicts in absence of meaningful cooperation. This thesis aims to show that water-sharing relations cannot be sufficiently described in black-and-white terms of conflict versus cooperation, and instead suggests that discourse of interactions better accommodates the complex realities of transboundary water management. By applying Naho Mirumachi's TWINS matrix, the author reevaluates the two present treaties of water sharing between India and its neighbors Pakistan and Bangladesh, namely the Indus Water Treaty and the Ganges Water Sharing Treaty. Despite being regarded as success stories of transboundary river cooperation, these treaties do not necessarily remove potential conflict, which further demonstrates how conflict and cooperation coexist. It has become increasingly clear that both of the examined treaties are very limited in providing involved countries with their growing needs, and without proper dispute resolution provision, they are slowly but surely losing their ability to prevent rising tensions and potential conflicts. With India showing inclinations to change its actions within or even outside the treaties (e.g. exploit the provisions of Indus Water Treaty; demolish the Farakka Barrage), meaningful dialogue seems to be more important than ever to prevent heightened securitization and deepened mistrust between the countries.

**Key words:** India-Pakistan, India- Bangladesh, water security, TWINS

## 摘要

雖然政治學界廣泛地討論水資源安全的問題，可是迄今為止絕大部分的研究採取合作衝突相兩者互排斥的分析方法。有些學派主張水資源短缺一定導致衝突，而制度主義學派認為在大多數情況下水資源安全推動國際合作。環境安全與衝突研究中的科學共識認為水資源不是衝突的起因而是合作的理由，於是繼續提倡合作衝突兩者相互排斥的概念。筆者認為如今的非黑即白分析尚未能夠正確描述水資源安全的衝突合作相互作用的實際。碰到了這個研究空白的問題，筆者應用 Naho Mirumachi 發展的「TWINS」架構來檢視印度-巴基斯坦與印度-孟加拉關係中的水資源安全。「TWINS」架構讓我們深入地檢視「1996 年 12 月 12 日印孟簽署分享恆河水條約」與「1960 印度河水域條約」這兩個條約。新世紀增長需求跟耗盡水資源的問題越來越清楚地標明，根據這兩個條約，水資源的供水與解決衝突能力有限。雖然被視為跨界河川合作的成功故事，可是這兩個條約不足消除潛在衝突，而進一步表明衝突與合作是同時存在的。最近印度政府表明關於水資源的政策改變，比如最佳地利用 1960 印度河水域條約的規定或清拆法拉卡壩。為了防止安全化過程升高，立即開展有意義的對話至關重要。

關鍵字：印度-巴基斯坦、印度-孟加拉、水資源安全、TWINS

## LIST OF IMPORTANT ACRONYMS

BBC – British Broadcasting Corporation

GDP – Gross Domestic Product

GWA – Ganges Water Agreement (1977)

GWSH – Ganges Water Sharing Treaty (1996)

IWT – Indus Water Treaty (1960)

NGO – Non-Governmental Organization

PIC – Permanent Indus Commission

TVA – Tennessee Valley Authority

TWINS – Transboundary Water Interaction NexuS

UCDP – Uppsala Conflict Data Program

UN – United Nations

UNDP – United Nations Development Programme

UNFCCC – United Nations Framework Convention on Climate Change

USSR – Union of Soviet Socialist Republics

WB – World Bank



# 1. INTRODUCTION

Water is an essential element in human biological processes, providing primary needs such as food and energy, supporting industrial development and last but not least, enabling a well-functioning ecosystem of our planet. On one hand, water is crucial for all aspects of life on Earth, however, its availability is not equal throughout the world. In 2016, the World Bank reported data that showed 1.8 billion people live in areas of physical scarcity, while by 2025 approximately the same number of people is predicted to be living in areas of absolute scarcity. (World Bank 2016) At the same time, according to the United Nations, water shortage will continue to be a problem for about 3 billion people. (UNDP 2006) While the people are divided among nations, rivers and other fresh water resources do not follow these man-made boundaries, therefore often becoming objects of shared interest. Shared water interactions are usually described in terms of conflict or cooperation, with the latter taking form of joint management through treaties. However, many treaties have been a target of criticism for being inefficient and unequitable in the face of the present and future water challenges. The ever-growing population on one hand and the diminishing quantity and quality of fresh water on the other suggests that the demand surpasses the supply; therefore, the argument that water shortage could cause tensions seems justified.

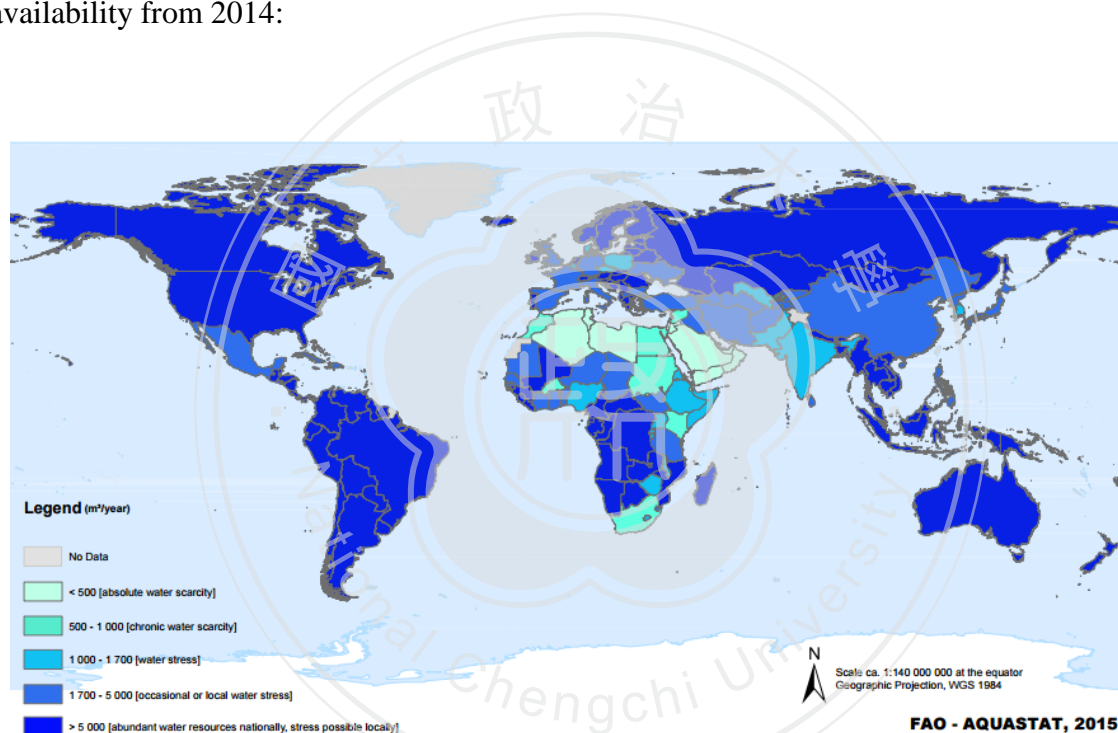
Water security represents a part of the environmental threats, whose rising importance can be observed in the ongoing conceptualization of non-traditional security issues. The unprecedented experience of the 20<sup>th</sup> century, such as the Cold War, challenged IR scholars to redefine security and broaden the concept so that it would include elements that affect individual, not only state security. Furthermore, recent years have presented us with an increasing number of environmental issues, consequentially attracting much of

the scholarly attention to try and find the link between these environmentally-detrimental factors and security. (Urban 2008, Tuchman Matthews 1989) To accommodate all these changes, Barry Buzan argues that the traditional view of security is outdated and could therefore benefit from “widening”, so to include sectors such as regional, societal and environmental security. (Buzan 1997) Security studies therefore expanded their research focus to non-state actors, economics, environment, demographics, etc. This new conceptualization of security studies includes *human security*, which was further defined in the United Nations Human Development Report as encompassing seven factors such as economic, food, health, environmental, personal, community and political security. (UNDP 1994) The report phrases the need to re-conceptualize security as follows:

*“The concept of security has for too long been interpreted narrowly: as security of territory from external aggression, or as protection of national interests in foreign policy or as global security from the threat of a nuclear holocaust. It has been related more to nation-states than to people. The superpowers were locked in an ideological struggle-fighting a cold war all over the world. The developing nations, having won their independence only recently, were sensitive to any real or perceived threats to their fragile national identities. Forgotten were the legitimate concerns of ordinary people who sought security in their daily lives. For many of them, security symbolized protection from the threat of disease, hunger, unemployment, crime, social conflict, political repression and environmental hazards.”*

(UNDP 1994)

This thesis focuses on water security as one of the most tangible aspects of non-traditional security threats. The numbers speak for themselves: world's 97% of water is unfit for human consumption, with the remaining 3% mostly being trapped in the ice caps and the small remains left to supply the growing world population. (Dimitrov 2002) It is not surprising that the per capita volume of available water decreased from 40,000 cubic meters in the beginning of 19<sup>th</sup> century to just under 6000 cubic meters in 2014. (World Bank 2015) The map below shows the per capita total renewable water resources availability from 2014:



**Figure 1 Total renewable water resources per inhabitant in 2014 (FAO 2015)**

The clear evidence of world's decreasing water availability and simultaneous rise of demand have set the water-related issues on research agendas in many fields. This thesis aims to explore the link between water shortage and inter-state conflict over transboundary water resources. Water is one of the resources that have no alternatives and at the same time it is essential for life on this planet, therefore it seems reasonable to expect conflict to arise in times of shortage. The growing number of people that not only

drink water, but also use products that require substantial amounts of water to produce, suggest the Earth will need more and more water resources. However, the overexploitation and mismanagement of the environment have led, among other consequences, to the depletion of water resources, which has given us a taste of what the future of water conflicts could be like. The question that often comes to mind is why has this issue not been more widely discussed and addressed?

In academic circles, the link between water scarcity and violent conflict shaped two major schools of thought, one stating that water conflicts will increasingly become part of the security reality, while the other group of scholars sees water shortage as a reason for cooperation, not war. This division in the academia on the topic of water conflicts can be demonstrated by first looking at the arguments presented by a group of academics, who suggest that the future conflicts will increasingly revolve around water, mostly because water shortage reduces the quality of life and therefore inevitably leads to tensions and even violent conflict. Another point of view presented by this school, the so-called *neomalthusians*, is that water will increasingly become a source of political and economic power, thus joining the group of predominantly non-renewable resources that are worth starting a conflict over. (P. H. Gleick 1993, Cooley 1984) On the other side we have those who acknowledge the issues water shortage brings, however they also emphasize that water has never been proven the sole reason for a state to start a war. Instead, they argue, the water-related aspects of international relations bring about various forms of cooperation. (Brown, Hammill and McLeman 2007, T. Homer-Dixon 1999, Wolf 2007) As we will see in more detail in the literature review, the reality of so-called “water wars” is widely disputed in the academic literature, with the prevailing consensus arguing that

water as such has never been the leading reason for a state to go into war, however it can exacerbate existing tensions.

Of course putting it like that also opens up possible further discussions of what exactly is a water war and does it necessarily need to be fought between states to be perceived as a security issue? Or can it simply be a war between the human kind and the environment, in which vulnerable societies die directly of thirst, water-shortage related famine or commit mass suicides as a response to the helplessness of the situation?

These questions and the need to address them have been widely debated in academia, politics and even media. The relevancy of this topic can therefore also be demonstrated by a number of media reports that try to link social tensions or even international conflicts to resource shortage. The Smithsonian Magazine article from June 2013 said: *"In Syria, a devastating drought beginning in 2006 forced many farmers to abandon their fields and migrate to urban centers. There's some evidence that the migration fueled the civil war there, in which 80,000 people have died"* (Hammer 2013) This water-stricken area, where the already dry climate has recently provided even less water than usual, has become one of the most commonly referenced cases when talking about relevancy of water shortage as a trigger for civil unrest. The whole region is known for its hydrological variability, however in the past century Syria has experienced six major droughts, of which the last two lasted for more than just one season - in the last case as long as 5 years between 2006 and 2011. Serious effects on agriculture extended to mass dislocations of rural communities to urban areas, further destabilizing social and political structures in the country. (P. H. Gleick July 2014) The graveness of the situation was recognized by the Food and Agriculture Organization (FAO) Syrian Representative Abdullah bin Yehia,

who in 2008 expressed his concerns about the multiplying effect the drought could have on already destabilized Syrian society, which was already suffering from constant influx of Iraqi refugees since the 2003 US invasion. (Femia and Werell 2012, P. H. Gleick 2014)

The same issue appears in Jordan, where the loss of water from the Jordan river combined with population growth and the additional influx of refugees from Palestine, Syria and Iraq intensified the already existing tensions. (Hagen 2011). Another recent BBC news report (BBC 2016) from Central Asia explains how former Soviet-supported system of resource sharing between four states (Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan and Kyrgyzstan) started crumbling in the post-USSR era. Balancing closely intertwined issues of energy, water and food security, these Central Asian states started experimenting and going from unilateral measures to (still insufficient) attempts of cooperation. In addition to forced migration, the border areas have witnessed a number of violent demonstrations and some claim that this is just the beginning. The combination of water, power and food shortage, together with corrupt government, bad governance and the instability of the wider region (Afghanistan), could be the perfect recipe for disaster. Meanwhile in the South Asia, from June to October 2016, the media reports drew our attention to worsening relationship between India and Pakistan, thus giving us a good example of how previously successful agreement on transboundary water management could be used as a diplomatic weapon. India's Prime Minister Narendra Modi ordered his country to "try and exploit to the maximum" the Indus river, which would have serious implications for the downstream Pakistan that officially controls the usage of the Indus river water. (BBC 2016) All these incidents suggest that water shortage is an important issue in today's world and that current forms of cooperation might not give the most optimal results.

The table below shows some more cases of water-related conflicts in the years 2000-2016. In total, there have been 193 cases recorder by the World Water organization and a full list can be found on their website.

YEAR	PARTIES INVOLVED	DESCRIPTION
2000	Ethiopia	Man stabbed during a fight over freshwater supplies during famine.
2000	Central Asia: Kyrgyzstan, Kazakhstan, Uzbekistan	Kyrgyzstan cuts off water supplies to Kazakhstan; Uzbekistan does the same due to Kazakhstan's unpaid debt.
2001	Iran, Afghanistan	During a severe drought the Taliban cut off the flow of the Helmand River between Afghanistan and Iran. One of many violations of unratified water agreement between the two countries.
2006	Israel, Lebanon	Hezbollah damaged Israel's wastewater plant, in response Israel attacked a number of pipelines and pumps along the Litani River.
2009	Madhya Pradesh (India)	Family killed by a small mob for illegal water withdrawals. Due to drought and unequal water distribution 50 violent clashes were reported.
2012	Mali, Mauritania	Protests and violent clashes between the Mauritians and Mali refugee seekers over scarce water and food supplies.
2015	Iran, Afghanistan	Dispute over allocations and rights over Hari Rud River lead to open fire between Iranian border guards and Afghani villagers.

(World Water 2016)

The list of the water shortage cases and related disputes does not end here, however this thesis does not aim to provide an overview of water-related conflicts, but rather focus on two of the less-researched water interactions between India and its neighbors, Pakistan and Bangladesh. The next subchapter will therefore present the questions of water shortage in the context of the three countries relations that this thesis hopes to explore.



## 1.1. AIM OF STUDY

The above paragraphs demonstrated the importance of water in various civil and interstate conflicts. This thesis will focus on the interactions over transboundary rivers and the usage of water resources as foreign policy tools, all through examining the downstream-upstream riparian balance and its implications for inter-state dialogues over shared rivers. Through two case studies of regional superpower and hydro hegemon India's water disputes with its neighbors, namely Pakistan and Bangladesh, the author would like to examine how water shortage produces cooperation and conflict over the shared water resources and how this further shapes inter-state relations. India is the upstream riparian of both the Indus and the Ganges River, thus having a geographical advantage over Pakistan and Bangladesh. After the breakup of British India, the newly formed countries faced a number of issues, including the sharing of transboundary rivers. The issues have been addressed at the international level; however, the solutions seem to have provided temporary relief that has not taken into account the changes in water demand and supply, as well as the broader regional context. India and Pakistan have until recently managed their shared water interests over the Indus River through the World Bank-brokered Indus Water Treaty, signed in 1960 by Prime Minister of India Shri Jawaharlal Nehru and President of Pakistan Field Marshall Mohammad Ayub Khan. The treaty divided the Indus River and its tributaries between the signatory countries (World Bank 1960). On the other hand, the Indian Prime Minister H. D. Deve Gowda and the then-Bangladeshi Prime Minister Sheikh Hasina Wajed signed the Ganges Water Treaty of 1996, thus agreeing on a 30 year water sharing bilateral agreement. (Rahaman 2006) While the Indus Water Treaty survived three Indo-Pakistani wars, prevented India from exploiting its upper riparian status and was generally seen as a shining example of successful water negotiations, the treaty between India and Bangladesh still left the lower-riparian state in



a disadvantaged position. Both treaties have had its supporters and critics, however due to increased water demand in the past couple of years, India is looking for new ways within the treaties to increase its water shares.

The thesis argues that cooperation and conflict are not mutually exclusive, an either/or scenario as it is often viewed in the literature, but rather that both concepts can coexist. Thinking about conflict and cooperation on a continuum makes it hard for us to evaluate the actual situation in water negotiations, for example, the coexistence of joint data sharing between some Indian and Bangladeshi institutions on one hand and nuanced political conflict on the Ganges River on the other hand. To address such issues, this thesis proposes to follow Mirumachi's *TWINS* matrix that enables us to evaluate cooperation over water issues in a broader context, thus avoiding the black-and-white analysis. In this way, the thesis analyses the simultaneous interaction of conflict and cooperation within the inter-state water disputes. Furthermore, the thesis aims to identify the gaps between the literature on water-related conflicts and the water management policies in the selected cases.

The topic of water security and conflict has been more actively researched in the last couple of decades, (Gleditsch, Owen, et al. 2006) mostly due to the ever-depleting water resources resulting from industrial use, population growth and consequently the climate change. To further link the two concepts, this thesis hopes to explore the following questions in relation to the chosen cases:

First, to provide academic background on the importance of water security as a threat-multiplier or cause for conflict and furthermore, to apply these findings to the two case studies and analyze the possible discrepancies.

Secondly, to use the literature and the case studies to discuss the questions of transboundary water resources, the conditions under which states cooperate with each other on this issue, and on the other hand, the conditions under which they abandon collaboration and instead find conflict to be more beneficial. The thesis aims to look into the water-related treaties between the two countries in the broader context of the increased demand due to population growth, irrigation needs, hydropower and industrialization; interstate political and economic relations and the country's involvement in international institutions. Where there are treaties dealing with transboundary water, how have the water treaties helped to build cooperation and how have they evolved with the changing conditions? Furthermore, do the treaties provide equitable solutions to water distribution, or do they further highlight the power relations between the upstream and downstream riparians? To answer this question, this thesis hopes to look into the differences between the upstream-downstream power relations in the two chosen cases. According to some scholars in the literature review, conflicts arise when the downstream riparian is powerful enough to make claims and presents a considerable military threat. Unlike most of the literature so far, the thesis also tries to define the interstate water relations in terms of interaction, instead of the black-white scenario of conflict or cooperation.

Lastly, the case study and concluding chapters will focus on the current situation and hope to demonstrate the policies and negotiations in the chosen cases, and the new developments in the water treaties and if they accommodate recent challenges of water management.

## 1.2. RESEARCH METHODS

Most of the research in this thesis is an interdisciplinary qualitative study and it analyzes two case studies: water shortage in India-Pakistan and India-Bangladesh relations. Both of the cases share many similarities, for example, India as the upper-riparian has a geographic advantage over its neighbors, whose water availability therefore highly depends on India's consumption. Both cases have a long-standing treaty that regulates the transboundary water management that provided a solution after the break-up of the British India. However, recently the Indian government put some unprecedented pressure on the Indus Water Treaty that settles the water issues between India and Pakistan, suggesting that water could be used to achieve some of their foreign policy goals in the Indo-Pakistani political disputes. At the same time, the relations with Bangladesh over the Ganges River have recently not seen any such tensions, suggesting there is a factor that makes a difference in the two downstream-upstream riparian dialogues. An example could be Pakistan's possession of nuclear weapons and the ongoing territorial disputes in the Kashmir region. On the other hand, Bangladesh's relative lack of power as a downstream riparian compared to Pakistan could explain why has Bangladesh not made any recent river claims.

The thesis uses two case studies in order to get a comparative perspective of water interactions in a shortage-stricken area of South Asia. Because both cases include the same actor (India), and is set in a similar political, economic and cultural time and space, the author hopes to identify the patterns for water interactions, their causes and possible implications. The upstream-downstream riparian power balance in both cases affects the water interaction and the water treaty effectiveness. The case study chapters will therefore explore this relationship and see how it shapes the water interactions. The two main possible scenarios are: a strong downstream riparian that can make claims and put

pressure on the upstream state, or a weak downstream riparian, with no military, economic or political means to influence the upstream state, and instead goes with what the stronger neighbor suggests. In this context, water security can be used as a tool to achieve foreign policy goals.

By combining the approaches borrowed from IR, security studies and water management, the author hopes to gain a sufficient insight into the complex issues of water shortage and its relevance for interstate conflict.

The map below shows us the uneven water supply in different river basins from 1995 and estimations for 2025. Both the Indus and Ganges-Brahmaputra River basins are marked with red colour showing they fall into the “scarcity” category.

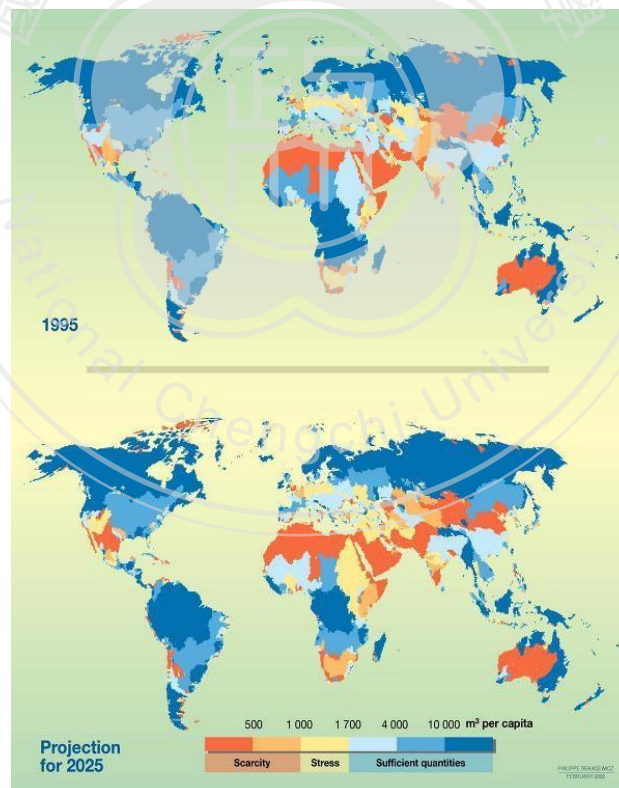


Figure 2 Water supply per river basin in 1995 and 2025 (Revenga, et al. 2000)

In addition to that, the great majority of both Pakistan’s and Bangladesh’s freshwater supplies originate outside of their territory (namely in Tibet). As we see on the map below,

this geographical characteristic makes the two countries highly dependent to the water strategies of the upstream riparian – India.

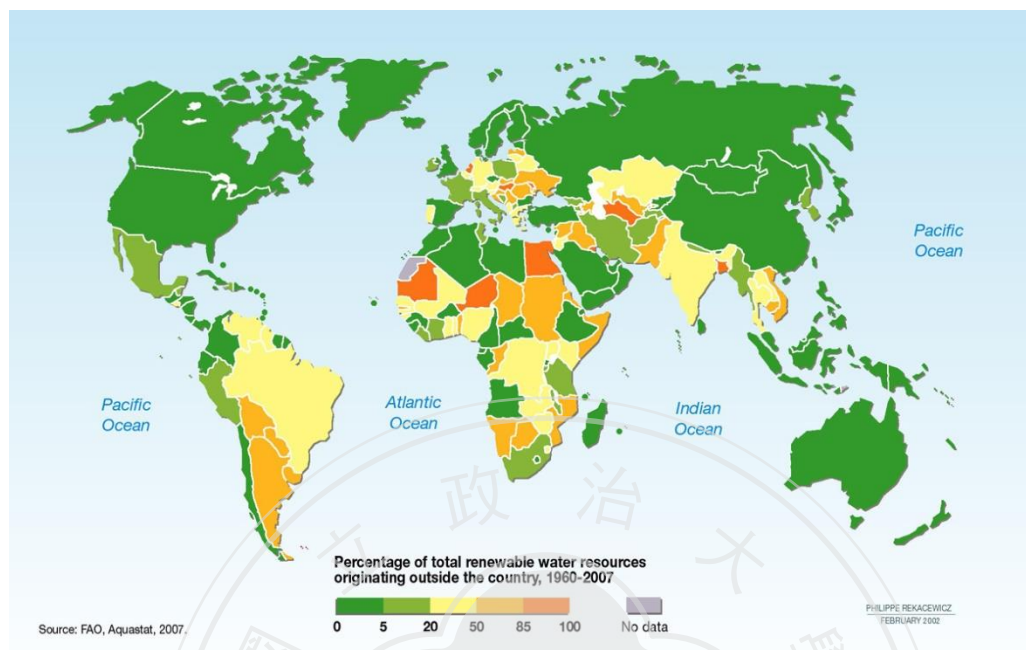


Figure 3 Dependency Ratio (FAO UN 2007)

As we will find out in the literature review, most analyses conceptualize water as either predominantly a source or exacerbating factor of interstate armed conflict or cooperation. When operating with the term “armed conflict”, this thesis does so by using the definition established by the Uppsala Conflict Data Program (UCDP):

*“An armed conflict is a contested incompatibility which concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths.”* (Wallensteen and Sollenberg 2001)

Alternatively, cooperation over water resources can be defined as joint action through international regimes, such as institutions and agreements. When talking

about water cooperation, a treaty or an agreement regarding shared water resources is seen as an act of cooperation. (Dinar 2007)

However, this thesis agrees with Zeitoun and Mirumachi (2008), who claim that analyses that portray these two concepts as mutually exclusive inevitably set themselves up for oversights of many “in-between” scenarios. Therefore, instead of the standard conflict versus cooperation analytical approach, the author aims to apply Mirumachi’s framework known as TWINS (Transboundary Water Interaction NexuS). TWINS provides us a two-dimensional matrix with cooperation intensity (ranging from *confrontation of issues*, *ad hoc joint action*, *common goal formation*, *common norm formation*, *collective identity formation*) represented on the horizontal axis and conflict intensity (*non-politicized*, *politicized*, *securitized* and *violized*) on the other axis. Below is a more detailed explanation of these two axes, as described in Mirumachi’s book *Transboundary Water Politics in the Developing World* (2015):

**Cooperation intensity** as explained by the author of TWINS:

*Confrontation of issues:* Both involved states acknowledge the issue and deal with it on a domestic level, there is no intent for coordination of goals or action between the states.

*Ad hoc joint action:* Joint actions are taken, but with different goals. This level represents a weak intensity of cooperation.

*Common goal formation:* Goal is shared, but ways to achieve it are not coordinated between the two states. Different actions on two sides all work on delivering the same objective.

*Common norm formation:* This level is characterized by joint action towards common goals and norms, most commonly institutionalized in treaties and agreements over transboundary water management.

*Collective identity formation:* Common identity represents the ultimate level of cooperation, at which two sides do not differentiate between their domestic and common international interests and needs.

On the other hand, the Mirumachi explains the **different levels of conflict intensity** as a reflection of the varying prioritization of issues on the political agenda:

*Non-politicized:* Issues that do not concern the state and the state authority does not have the issue on its political agenda.

*Politicized:* The issue has been put on the political agenda, therefore government attention and resources are given to the issue and relevant policies.

*Securitized:* The issue is presented as an existential threat and emergency measures are used to deal with the situation.

*Violized:* Violent, militarized action over the issue.

These two scales allow us to trace the developments on a two-dimensional matrix (as seen below) in the transboundary water interactions, without making hasty conclusions that one aspect of cooperation necessarily means absence of all conflict (and vice-versa).



	CONFRONT. OF ISSUES	AD HOC	COMMON GOAL FORMATION	COMMON NORM FORMATION	COLLECTIVE IDENTITY FORMATION
NON- POLITICIZED					
POLITICIZED					
SECURITIZED					
VIOLIZED					

Figure 4 TWINS matrix

TWINS matrix suggests using speech acts by relevant authorities as markers for interaction analysis. Mirumachi uses categorization of speech acts as *assertive*, *direct* or *commissive* acts. An *assertive speech* could be e.g. joint declaration of on water quality improvement, while a *direct speech* involves unilateral actions for securing water resources, such as closing the dam gates. On the other hand, a *commissive act* is a bilateral measure to address the issue, such as signing a bilateral treaty. Any speech act carries with it the potential to influence the conflict and cooperation over transboundary waters. (Mirumachi 2015)

Looking at the shared water *interaction* instead of mutually exclusive concepts of cooperation versus conflict allows us a more accurate evaluation of the transboundary water developments. The TWINS nexus thus includes a political dimension of water treaties, showing us that some forms of cooperation might perpetuate the conflict. The framework allows us to evaluate the water-shortage related dynamics between states, including negotiations that have come to a stalemate or deteriorating treaties. By putting



the water interaction into a broader context, the TWINS framework encourages us to think of possibilities where conflict and cooperation can coexist. The matrix evaluates conflict and cooperation each on a separate axis, allowing us to trace the developments in the interstate water interaction throughout the chosen period.

The research methods primarily used for analysis of two similar cases is documentary research, meaning that the thesis relies on already written resources: academic articles, documents such as the two water treaties, statistical data and reports by international organizations, governments, non-governmental organizations, think tanks and media. The collection of resources and data was limited to English language and sources available at the universities in Taiwan and internet databases.

### 1.3. HYPOTHESES

The hypotheses discussed in this thesis are the following:

1. The more serious water shortage issue, the more chance for it to multiply and exacerbate other existing issues (e.g. political and military disputes) between the two countries.
2. The stronger the downstream riparian, the more conflictual is the water-sharing relationship.

### 1.4. IMPLICATIONS

This thesis hopes to promote the importance of water shortage as a threat-multiplier that should be included in a comprehensive security matrix. Furthermore, it encourages the application of TWINS framework to water interaction analyses, which would help fill

some of the gaps in the majority of existing literature that perceives conflict and cooperation over shared water resources as mutually exclusive, instead of simultaneously occurring concepts.

Through the analysis of current policies regarding this issue, the thesis aims to provide an evaluation and provisional suggestions for the successful management of shared water resources in water-stressed countries such as India, Pakistan and Bangladesh. The Indus Water Treaty was originally intended to promote overall peace in the region, however so far it has not provided sustainable solution even for the sufficient water supplies to both signatory states. However, this thesis hopes to demonstrate that a different approach to transboundary water treaties could be more successful in delivering these objectives. With the rise in demand and decreasing water supply, the author believes successful water-sharing strategies could benefit the overall stability of the region by first providing water security at a local level, while sharing the benefits with the wider region. Water scarcity can cause social tensions within and between states; therefore, the thesis argues that water shortage as a catalyst for inter-state conflict calls for more attention. Because of water's strategic importance and its potential usefulness to achieve foreign policy goals, the overall relationship between the countries is reflected in their approach to the transboundary water resources.

According to the literature, most of the water related conflicts arise from government's inability to adapt to the depleting resources, which calls our attention to the problems of efficient water management. This thesis hopes to address these issues and provide some suggestions, at the core of which lies the importance of good governance in water management. It hopes to demonstrate that environmental governance not only prevents

water shortages, but also eliminates water as a potential exacerbator of political, economic, social and ethnic tensions.

Finally, water scarcity as a cause of conflict is an emerging and often misunderstood phenomena. By better understanding the problems of India's water relations, more effective policy and enduring peace in the region can occur.

## 1.5 RESEARCH LIMITATIONS

While writing this thesis, the author encountered two major research limitations. First is the language barrier as all of the three researched countries have their own languages, e.g. Hindi, Urdu and Bengali, all of which are unfamiliar to the author. However, due to their common colonial past, the English language is either one of the official languages (India and Pakistan) or a recognized language (Bangladesh), therefore much of the official documents have been translated to English, thus supporting the research process when writing the thesis. In addition to this, many scholars have already contributed their knowledge of these topics and cases in English, providing further research material to the author of this thesis.

Secondly, due to the time and financial restrictions, no fieldwork was conducted to support the writing process. However, a sufficient amount of scholarly works and other documents was found in either the available libraries or the online databases.

## 1.6. THESIS STRUCTURE

In chapter two, the reader will find a detailed literature review on the topics of environmental security, water security and the links between water shortage and conflict.

Chapters three and four will each introduce one of the selected case studies, namely water conflict in India's relations with Pakistan and Bangladesh. The background information will be followed by the analysis of the water-related aspect of the inter-state relations, including the current developments.

Chapter five will aim to provide some policy implications and suggestions for the future research in this field.



## 2. LITERATURE REVIEW

### 2.1. ENVIRONMENTAL SECURITY

The 20<sup>th</sup> century started with two of the largest-scale wars in the human kind history, followed by a completely different experience of the Cold War. The resolution of the latter, together with other changes in the international environment encouraged IR scholars to rethink the concept of security and to expand it from military threats-only, to a much broader concept that include economics, environment, human security on a global level. (Walt 1991)

The increase in number and severity of environmental issues inevitably led to discussing the question whether this non-traditional issues represent a new chapter in security studies. While some environmental challenges remain to be perceived as abstract, the many more tangible extensions including water, food and energy security have attracted more and more scholarly attention. (Urban 2008, Tuchman Matthews 1989)

Environmental changes can trigger shifts in the balance of power and through that serve as destabilizers on various levels - from local to international. When natural resources are seen as means of power maximization, different actors (be it states, villages or ethnic groups) begin competing for resource-rich territories, while at the same time resource-poor territories can force mass migrations and with it strives between the displaced and the “host” population. (Wirth 1989) And while most of the so-called resource disputes usually involved non-renewable sources, there is considerable amount of evidence that the competition for renewables has already grown fiercer. (P. H. Gleick 1993)

Gleick (1993) observes that the waning of the Cold War and the increasing evidence of overexploitation of public goods (such as ozone layer, global climate and inequitable resource distribution) raised the question of redefining security. Including environmental issues in matters of (inter)national, human and ecological security makes sense if we recognize that any comprehensive security matrix should not see state and human security as separated from the environment, but rather inseparably embedded in it. The environment provides states with favorable conditions to ensure safety, however its exhaustible and limited nature means that it needs to be managed accordingly. Redclift (1999) links environmental challenges to competition between different actors at the international level. Traditionally environmental change is seen as a cause for security issues; however competition over the environment can be seen as the driving force behind environmental change. In a global market economy different state and transnational actors are looking for way to gain advantage in the battle for resources, with globalization and development creating uniformity of economic goals and at the same time the competition to achieve them. To do so most nation states and other relevant actors exploit the resources, leaving environmental action to NGOs and the (few?) governments who for any reason recognize the need for sustainable resource consumption. To make this possible, environmental security needs to occupy a more central role in geopolitics, including international and domestic political agenda. Given that the number of cases with security issues deriving from various environmental disasters, including resource shortage, some scholars remain bewildered at the existence of environmental management merely at the level of rhetoric, (Redclift 1999) however others claim that the securitization of climate change has been slowly yet persistently attracting more attention to these issues. (Brzoska 2009) Most recently the UNFCCC Paris Agreement has led some to believe things are turning for the better. (Rogelj, et al. 2016)

When talking about environmental security it is important to think about the relevant actors, as Redclift (1999) points out. Who has the responsibility for the environment in the global market economy, namely determining levels of consumption? With the economic and population growth this question proves important enough, however many believe that it is even more crucial to discuss it in the context of water shortage. Resource scarcity is not just a result of environmental change, but also a combined result together with population growth and unequal social distribution. This differentiates resource scarcity from so-called “environmental scarcity”, which combines all three relevant factors. Further researches should therefore focus on analyzing the interactions between the three factors, for example joint effects of “resource capture” and “ecological marginalization” on security. (T. F. Homer-Dixon Summer 1994)

Some scholars put the environmental degradation and scarcity issues in the same category, yet in contrast to the resource *wealth* conflicts. While resource wealth means conflict over non-renewable resources, disputes over scarcity usually involve cases of overuse and depletion, exacerbated by mismanagement of water, arable land and decreased access to other resources (e.g. forest goods). (Renner 2002)

On the other hand, some academics argue that climate change, one of the most hotly debated environmental challenges, so far has no proven effect on social tensions. (Gleditsch 2011) This group of scholars opposes the expenditure of security studies and especially national security to include environmental threats, because according to them degradation of the environment does not lead to organized violence among states, but rather deterioration of human well-being within states. They further argue that wars for resources are too costly and unnecessary due to technological development and robust

world trading system; economic decline due to deteriorating conditions might dampen interstate conflict and that pollution and scarcity rarely occurs on such an asymmetric and significant scale that it would lead to interstate conflict. (Deudney 1990) According to the scholars who oppose the linkage between environmental degradation and (national) security, there has been insufficient systematic research on the security implications of environmental degradation, despite providing conclusions on the physical implications of climate change. Their critique mostly rests on the claim that so far the statistical analyses have not proven convincing levels of linkage between environmental vulnerability and violent conflict, however there has been sufficient evidence showing how the burdens of climate change will add to the hardship of weak states and vulnerable societies.

## 2.2. WATER SECURITY

Relevance of water security can be demonstrated by just thinking about the importance of water firstly for human biological needs for fluid and water and secondly for the ecosystem. Food production heavily depends on water supplies and thirty-six percent of all food is produced on artificially irrigated land. The percentage is as high as fifty percent in countries such as China, Egypt, India and Jordan along with many others. Further analyses try and demonstrate the impact of China's increasing water shortage on global food security. (Postel 1997)

Water, food and energy nexus is a framework that shows us how the three parts are interconnected; specifically it tries to explain how management of one can affect the other two. The main objective of the nexus is to ensure sufficient amount of water, food and energy to meet the needs of the growing world population. (GRACE Communications Foundation 2014) Depletion and at the same time mismanagement of any of the three



resources can lead to a series of issues, while good governance of one always needs to include the other two as well. In most cases facing water shortage issues, scholars warn that the water mismanagement long predates the droughts; therefore the main reason for water scarcity is the government's inability to adapt to and mitigate the effects of water scarcity and increased demand by the growing population. (De Châtel 2014) Although all three components of the nexus are interconnected, this thesis will focus on the water part of the nexus and try to show how scarcity of water can cause or exacerbate civil and regional security issues. These issues stem from the limited ability of our planet to supply the increasing demands of the growing population.

When assessing the value of water, its irreplaceable nature can be linked to human well-being, economic growth and even national security. The biggest problem regarding the water nexus is (mis)management, which if not changed will lead to serious global issues, starting with geopolitical disputes. A hint of future problems can be sensed whenever drought strikes certain area and consequently food prices go up. In a world where food demands are getting higher and higher, this poses a serious problem. However, agriculture is not the only industry that relies heavily on water supply, although it is without a doubt the biggest consumer – energy sector, industries and urban areas with domestic needs all require their fair share of water supplies. Agriculture accounts for 71% of water consumption, followed by the industry sector (including energy sector) which uses 16% and is expected to rise due to industrialization of countries such as China and India. Domestic use of water accounts for 14% of water supplies. (World Economic Forum Water Initiative 2011, 29) We are thus faced with a question of how to start producing more with less water. Investing in agricultural technologies has traditionally been one of the most neglected areas. Common action supported by strong institutions

could address this, however weak international regime and a complex arrangement of tariffs and subsidies has (until now) only exacerbated this problem. (World Economic Forum Water Initiative 2011, 24)

Economists and experts have examined the relationship between water and economic growth, showing that growth is positively influenced by increased water use. If we categorize water as a non-excludable good provided by the government, then scarcity can mean that the government needs to invest in less accessible alternatives such as dams, desalinations plants, and other infrastructure, meaning that the costs would exceed gains in productivity. At the same time, the absolute availability of water may restrict the utilization. However, studies from 2004 show that so far, these two scenarios are not as widespread as some would claim, hence sceptics suggest exercising caution when giving warnings of future (economic) water crisis. At the same time, they admit that in the case of water-stressed countries, empirical analyses do not reject the adverse effects moderate to extreme water scarcity would have on economic growth. They conclude with an observation that water stress varies between and within countries; with transboundary water resources and limited outsourcing options presenting an additional obstacle to efficient water utilization. (Barbier 2004)

Why has the issue of water security not been properly addressed? If we look at the table below, we can see that natural water distribution has been (unfairly) divided between the arbitrary boundaries of nation-states (Allal and O'Connor 1999, 110):

	<i>1990s</i> (m <sup>3</sup> /year/inhabitant)	<i>Forecast 2025</i> (m <sup>3</sup> /year/inhabitant)
Lebanon	1500 - 4000	1000
West Bank	400 - 600	150
Israel	300 - 1000	200
Jordan	230 - 300	50
Gaza	70	35

**Figure 5 Water Availability in the Middle East (Allal and O'Connor 1999)**

The predicted water availability shows a significant drop in the already water stressed countries. The area has been known for its many cases of river water diversion schemes, for example water supply has been listed as one of the reasons for the 1967 Israeli occupation of the West Bank. (Allal and O'Connor 1999) Without a sustainable solution, water security in this as well as in many other areas around the world could become a source of competition.

Because water is so essential to all human activity, it seems obvious that lack of water could lead to disputes over remaining resources. Indeed, there is a thriving discourse that links water shortage to migration, ethnic or international conflicts, war and terrorism. This link will be further discussed in the next section, with some attention also given to the importance of shared waters in international relations.

### 2.3. LINKS BETWEEN WATER SHORTAGE AND CONFLICT

In the following subchapter I will present different sides within the scholarly debate on the link between water shortage and conflict and discuss the nature of this relationship.

In 2016, the World Bank estimated that 1.8 billion people live in areas of physical scarcity, and the same number is predicted to live in areas of absolute scarcity by 2025, and at the same time, according to the United Nations, water shortage will continue to be a problem for about 3 billion people. (UNDP 2006) (World Bank 2016) The ever-growing population on one hand and the diminishing quantity and quality of fresh water on the other side suggest that the demand surpasses the supply; therefore the assumption that water shortage could cause tensions seems justified.

In the introduction part of the literature review we already discussed the media coverages of the most recent water-related tensions and conflicts. However, it is not just the media that regularly expresses their concerns about the future of water security issues; academia has added its concerns as well. Thomas Homer-Dixon states that human-induced environmental challenges will contribute to various aspects of security issues: war, terrorism, diplomatic and trade conflicts. (T. F. Homer-Dixon 1991) Focusing more on water-related conflicts, scholars identify two of the following scenarios for water-related conflicts:

1. War for water resources to gain more power. Even though these kinds of wars are traditionally fought over non-renewable sources, Gleick (1993) argues that even water can provide a source of economic and political strength. In such case, military conflict over water resources would be justified. This scenario depends on the degree of scarcity, inequitable distribution, the number of actors that share the water resources and their relative power as well as possible access to alternative resources. Some suggest this view falls within the Neomalthusian school, which says that population growth, economic and industrial development are expected to produce increased demand and insufficient supply at the same time, leading to

securitization of water and thus likely occurrence of violent conflict. (Hensel and Brochmann 2008) In support of these claims, scholars rely on data provided by various institutions, such as the UN, that shows the current availability and distribution of freshwater resources in relation to the expected increase in demand.

2. Using water resources as an offensive/defensive weapon. Due to its importance, water has been a target as well as a tool of war in many cases – bombing of water dams in the World War II, diversions of the Jordan river, Saddam Hussein’s poisoning of Shiite Muslims’ water supplies (P. H. Gleick 1993) and as mentioned in the introduction, more recently the Prime Minister of India also called for using the Indus river in its on-going dispute with Pakistan. (BBC 2016) Transboundary rivers provide many opportunities to the upper riparian, whose geographically advantageous position makes it possible to manipulate the water flow for the downstream users. However water can be a powerful tool not only in the hands of governments, but also non-state actors such as terrorist groups. These can either target the water infrastructure or contaminate the water supplies, however the possibility of a large-scale destruction caused through water contamination is mostly considered small. Some of the water-terrorism cases include 1984 contamination of water supplies with salmonella in The Dalles, Oregon; 1992 contamination of Turkish Air Force compound water tanks with lethal concentrations of potassium cyanide, and regular destruction of dams in by the Mozambican National Resistance throughout 1980’s, in addition to many other examples and attempts. (P. H. Gleick 2006)

On the other side of the spectrum are scholars who see water shortage as an opportunity for peace and cooperation, instead as a catalyst for conflict. The supporters of this view argue that there is no empirical evidence for the future to be that of water wars, since water is not easily converted into power. (Spillmann 2000) While a full-scale water war is highly unlikely, these scholars still admit that unilateral actions as an answer to unresolved issues on shared water resources will lead to tensions and regional destabilization. Therefore, they conclude, the water-stress itself is not a direct cause for conflict, but unilateral attempts to secure sufficient water supplies are. They see the answer in early cooperation, strong institutions and efficient treaties that provide monitoring and enforcement, shifting the focus from rights to needs and finally interests that ensure equitable distribution. However lack of these mechanisms might lead to internal and regional tensions that may have international implications. (Wolf 2007)

When discussion water shortage in relation to conflict, most scholars agree that water-related conflicts will act as catalysts and exacerbate other factors like poverty, ethnic tensions, poor governance, stunt in economic growth, etc. (Brown, Hammill and McLeman 2007)

To prevent and mitigate such challenges, some researchers propose quantitative indices to measure the vulnerability of states that would help the policymakers in identifying and solving water related issues. Areas that are most commonly seen as problematic include the Middle East and Central Asia, where multiple countries have been forced to share the scarce resources. Due to its persistent and tangible nature, water security in these regions already entered the arena of high politics. (P. H. Gleick 1993)

Nowadays most water related conflicts arise over the shared water resources, mostly rivers. Equitable distribution of shared water resources is said to be in contradiction with sovereignty of involved states, bringing the discussion in the field of international law down to the conflict between the principle of sovereign ownership and exclusive rights over one's resources on one side and on the other the principle of shared ownership and equitable use of joint river, with the latter being the center of many international river treaties. (Hanqin 1992) However even with the equitable distribution ensured by the joint management river treaty, it is also important to ensure that it provides balance between human consumption and ecological sustainability. (Dimitrov 2002) Another important point to consider when dealing with this category is to distinguish between transboundary rivers and rivers that form a border. The conflicts over transboundary rivers are expected to arise in cases of water shortage, while boundaries that run along the river might lead to conflicts over the boundaries themselves. Recent researchers also pointed out that in order to fully comprehend the dynamics of transboundary rivers, we need to focus on the whole river basins, instead of just one single river. (Gleditsch, Owen, et al. 2006)

Some argue that the water scarcity and demand ratio has been and will in the future make states more likely to expand on their river claims and even begin militarized conflict over the water resources. Claims will most likely arise and militarization will be considered when the demand for resources considerably surpasses the available supplies. On the other hand we have those inspired by liberal institutionalism who suggest that to prevent such scenarios, international agreements can sometimes help reconciling different claims, but have more success with minimizing militarization while aiming at ensuring sustainable and sufficient amount of water to all parties. Therefore, direct armed conflict over water issues is more of an exception, than a rule. Democratic regime is one of the characteristics of the two involved states that are often referenced when talking about

transboundary water resource conflict. According to the democratic peace theory, democracies are generally not expected to engage in conflict with each other because of shared values and compliance with international norms, such as paying more attention to resources and environment, therefore eliminating the chances of scarcity-related conflicts. At the same time democracies generally show more commitment to international treaties, which further prevents militarization of potential conflicts. (Hensel and Brochmann 2008)

Researches discussed in the above sections have been valuable in evaluating the probability of exclusively water-related wars; however, this thesis wishes to expand on this and look at water conflicts in a broader scheme of interstate relations. That is not to say that water shortage conditions the entire relationship, but that in some cases it brings a new dimension to the state-to-state interactions.

Other scholars like Zeitoun and Mirumachi (2008) question whether cooperation is always inherently good, and claim that conflict and cooperation almost always coexist, so it is more appropriate to think of transboundary water *interaction* with important political and social aspects to it. As we have seen on the previous pages, some scholars (e.g. Homer-Dixon, Gleick, etc.) argue that water resources will increasingly present a source of conflict, while others (e.g. Hensel and Brochmann, Wolf, etc.) claim that shared water resources lead to more cases of cooperation than conflict. Through the Transboundary Water Interaction Nexus (TWINS) framework Zeitoun and Mirumachi show us how the different aspects of the two almost always coexist. The matrix they use is a two-dimensional matrix with cooperation intensity (ranging from *confrontation of issues*, *ad hoc*, *technical*, *risk-averting* and *risk-taking*) represented by one axis and conflict intensity (*non-politicized*, *politicized*, *securitised* and *violised*) on the other, allowing us to trace the developments in the transboundary water interactions. Looking at the shared



water *interaction* instead of binary concepts of cooperation versus conflict allows us to gain more insight into the inter-state water sharing developments. The TWINS nexus thus includes a political dimension of water treaties, showing that some forms of cooperation might perpetuate the conflict. If water treaties prefer one party to another, or focus on for example data sharing between some institutions instead on resolving the actual conflict, is “any cooperation” really a step forward?

In the case studies we will see how treaties can also lead to future disagreements, however ideally these would still be negotiated within the framework of the treaty. The changing conditions and how they influence the water interactions will be further demonstrated in the next chapters through case studies.

Solving the transboundary river disputes calls for more international institutions and treaties, however they only seem to be effective on a regional level, instead of becoming globally accepted norms that could prevent future conflicts. (Haftendorn 2000) To address this “no-size-fits-all” issue some suggest paying more attention to causes of water conflicts that could provide more insight into most appropriate solutions. Haftendorn (2000) distinguishes between usage (i.e. construction of dams and power stations), distribution (relative and absolute) and pollution causes of water conflict. In addition to that I would suggest expanding the latter category to water resource depletion due to climate change and environmental degradation, including pollution.

Transboundary water disputes present the important dynamic between the upper riparian, who has the geographical advantage over the use of water resources, and the downstream riparian whose water utility depends on the upstream neighbor. Many scholars agree that conflict arises when the downstream riparian is more powerful than the upstream counterpart, giving the downstream riparian a chance to put necessary pressure behind its

claims for a more beneficial water management strategy. (T. Homer-Dixon 1999) Such developments can lead to an establishment of so-called water hegemony, which was explained by Zeitoun and Werner in their 2006 article *Hydro-hegemony – a framework for analysis of trans-boundary water conflicts*:

*“Hydro-hegemony is hegemony at the river basin level, achieved through water resource control strategies such as resource capture, integration and containment. The strategies are executed through an array of tactics (e.g. coercion-pressure, treaties, knowledge construction, etc.) that are enabled by the exploitation of existing power asymmetries within a weak international institutional context. Political processes outside the water sector configure basin-wide hydro-political relations in a form ranging from the benefits derived from cooperation under hegemonic leadership to the inequitable aspects of domination. The outcome of the competition in terms of control over the resource is determined through the form of hydro-hegemony established, typically in favour of the most powerful actor.”* (Zeitoun and Warner 2006, 1)

Others say that when compared to the democracy variable, development levels seem to have a significantly bigger impact on the transboundary water conflict. (Gleditsch, Owen, et al. 2006) According to them, the previous data suggested the undeveloped countries experience less water scarcity due to smaller levels of pollution, and developed countries experience less scarcity because they can invest in water management technologies. Gleditsch et al (2006) tested this hypothesis and concluded the statement is correct only in the case of developed countries, while undeveloped countries might still be affected by water shortage leading to conflict. However, the research also shows the developing countries suffer from both the increase in demand (due to industrialization and population

growth) and at the same time degradation of water resources, while usually not spending enough money on water management, therefore increasing the risk of water conflict.

The reviewed literature showed us that there is still much debate about the topics such as water security and its impact on interstate conflict. The literature also presents various possible scenarios of water-related disputes and evaluates the most common solutions such as international water sharing treaties. While the treaties provide temporary solutions to scarcity issues, they seem to not accommodate the changing water availability, as well as fail to ensure first equitable distribution and second compliance with the terms of agreement. At the same time most of the literature discusses this issue in terms of binary concepts such as conflict versus cooperation, with some of the researchers (e.g. Zeitoun and Mirumachi) proposing a more wholesome approach to analyzing international water interactions.

### 3. CASE STUDY I: WATER SHORTAGE IN INDIA-PAKISTAN RELATIONS

#### 3.1. BACKGROUND

India and Pakistan are among the many countries that share water resources (TWAP 2016). Furthermore, according to recent figures from the International Monetary Fund, Pakistan is one of the most water-stressed countries in the world, with a per capita annual water availability of roughly 1000 m<sup>3</sup> — amount also known as the water scarcity threshold.<sup>1</sup> (UNESCO; UNWWAP; UN-Water 2012) At the same time, Pakistan's water intensity rate is the world's highest, mostly due to its water intensive agriculture. (International Monetary Fund 2015) India is in a similar position, with 1116 m<sup>3</sup> per capita water availability, and with two of its major rivers (Indus and Ganges) both originating in Tibet. (WRIS 2015) Furthermore, the Indus Water Basin is the second most stressed in the world, and yet this is where most of both countries' water supplies come from. (Foreign Policy 2016)

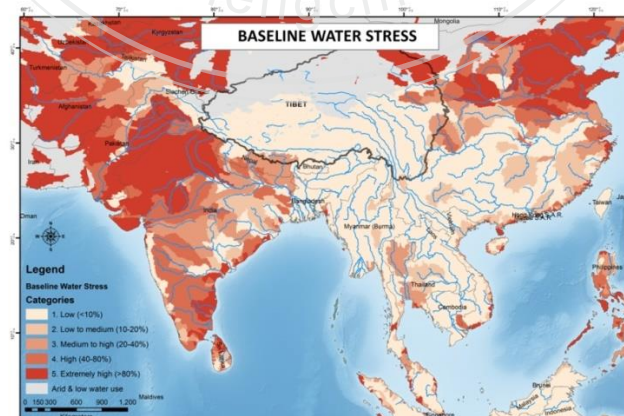


Figure 6 Baseline Water Stress map (Gassert, et al. 2013)

<sup>1</sup> The established and UN-supported criteria for water availability are assessed by looking at the population-water equation. The annual water availability criteria are as follows: water stress means per capita water supplies have dropped below 1,700 m<sup>3</sup>; amounts lower than 1,000 m<sup>3</sup> fall under category water scarcity; and anything lower than 500 m<sup>3</sup> is categorized as absolute scarcity.

The relationship between the two countries has been complex since the break-up of British India, leaving behind many tensions, including military, political, religious, ethnic, etc. However, this complex and for the most part conflictual relationship seems to have an aspect of cooperation that has given hope to many idealists: joint management of the Indus River Basin through the Indus Water Treaty (IWT). (World Bank 1960) After surviving three Indo-Pakistani wars since 1960's, the recent developments suggest that what was first viewed worldwide as a success story and an example of water sharing treaty is now quickly deteriorating into just another aspect of bad Indo-Pakistani relations. For the time being the future of the treaty is yet to be seen, however, most analysts agree that revoking the agreement would lead to a humanitarian catastrophe in an already water-poor country. The reason for that seems quite simple: under the current agreement, Pakistan is allocated 80% of all the water in the river basin. If India started controlling this, it would cut sole source of water supplies for a large part of Pakistan. (The Economic Times 2016)

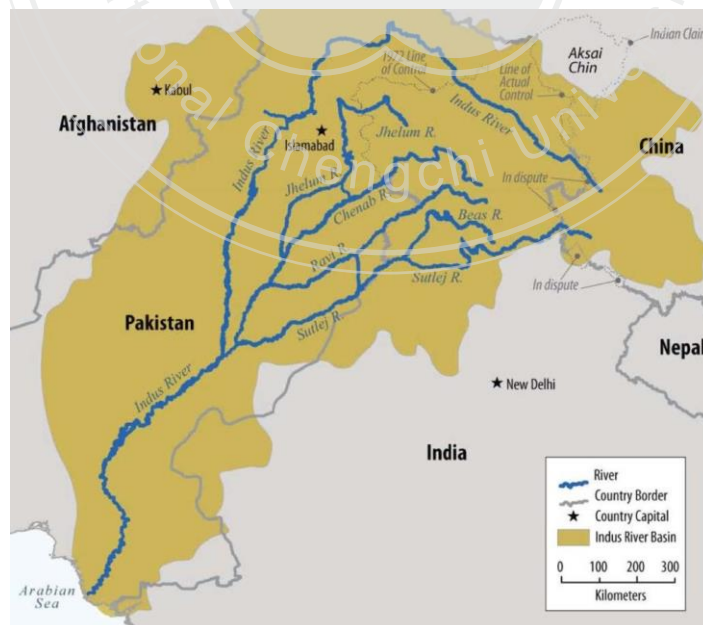


Figure 7 Indus River Basin map (ProPakistani 2016)

Historically, the development of the Indus Basin into the world's largest river basin irrigated area and the partition of British India brought about a very important question of water security. Because the Indus River and its tributaries flow through India first, India has an obvious advantage over the use of water. In 1947, the newly established Pakistan and its West Punjab faced the first water challenge: India's East Punjab government held complete control over the Indus River and its tributaries, while having no obligations to supply any water to the neighbouring West Punjab. After the first so-called "Standstill Agreement" that was negotiated for a period of 1 year, no state made an effort to start a new round of negotiations or to extend the existing agreement and as a result, India's East Punjab government cut the water supplies the day after the agreement expired on March 31, 1948. (Biswas 2009) Pakistan's overall discontentment with the situation led the two countries to the negotiations table – to negotiate the water management schemes for the second, and certainly not the last time. (Commonwealth Legal Information Institute 1948) In the light of the recent independence and the underlying political and religious conflicts, the negotiations were often seen as almost impossible, with the Governor-General of Pakistan, Muhammad Ali Jinnah, refusing mediator Sir Cyril Radcliffe's call for joint water management as expressed in the following quotation:

*"Jinnah told him [Radcliffe] to get on with his job and inferred that he would rather have Pakistan deserts than fertile fields watered by courtesy of Hindus."* (Biswas 2009)

Despite such less than cooperative attitude, the first couples of years after the partition of British India, the waters of the Indus were apportioned by the Inter-Dominion Accord of 1948 (also called the Delhi Agreement), which stated that India should release enough

water to Pakistan, in exchange for annual payments, which was basically just a continuation of the Standstill Agreement. However, the agreement also stated that this was but a temporary solution, and expressed hopes for a more permanent, friendly solution, but all further negotiations quickly got to a stalemate. The unsatisfied Pakistan expressed their keen interest in holding another inter-dominion conference, but also stating that should the two countries fail to find an equitable solution, the International Court of Justice would be asked to solve the water issues. The following years demonstrated India's reluctance for third party involvement, and instead their preference for an *ad hoc* tribunal, as suggested by the Prime Minister Jawaharlal Nehru, who advocated for the establishment of an International Commission that would equally include representatives from both countries. Furthermore, Pakistan claimed the 1948 agreement was signed forcibly, and that the *ad hoc* sum the West Punjab had to deposit with the Reserve Bank of India also presented certain difficulties. Despite these reservations from Pakistan, India dutifully observed the 1948 Inter-Dominion Accord until it gave way to the final and still present Indus Water Treaty. (Biswas 2009)

As mentioned before, India strongly opposed referring the Indus River dispute to a third party, but ironically, it was their government's foreign guest who took the negotiations to the international arena. In 1951, David E. Lilienthal, former chairperson of Tennessee Valley Authority (TVA) and US Atomic Energy Commission, visited India to talk about the TVA river development strategies. During this visit, Lilienthal took a closer look at the water issues in the Indus Basin and suggested that peaceful resolution of this issue would promote overall peace in the region. (Transboundary Waters 2007) To start the process, Lilienthal included his friend and then President of the World Bank, Eugene R. Black. He extended a formal invitation for cooperation the prime ministers of both India (Nehru) and Pakistan (Liaquat Ali Khan), who then in September 1951 formally accepted



the initiative to start a new round of negotiations. But before the talks started, the Prime Minister Liaquat Ali Khan was assassinated, so Black had to restart the whole process with Khan's successor, Khawja Nazimmudin. Both India and Pakistan accepted the World Bank's involvement and promised not to manipulate water supplies throughout the co-operative process. In May 1952, engineers from India, Pakistan and the World Bank first met in Washington, and engaged in extensive discussions on outlining the river management scheme that would benefit both sides. The next two meetings in Karachi (November 1952) and Delhi (January 1953) highlighted the still unresolved differences on water development of the Indus System. To clarify these differences, both governments sent their respective plans to the World Bank for analysis. The two plans mostly differed in the water allocation amounts and after some pressure, India and Pakistan both lowered their expected share. Unfortunately, these miniscule changes were not enough to bring about a mutually agreeable solution, so in February 1954, the World Bank announced that the resulting stalemate does not support further progress. The Bank also prepared its own proposal, in hope that the two countries will find the following terms more acceptable: Pakistan was given exclusive control over the Western rivers (Indus, Jhelum and Chenab), except for the minimal flow of Jhelum traditionally used in Kashmir. India, on the other hand, was given exclusive control over the Eastern rivers (Ravi, Beas and Sutlej), except for a transition period during which India would continue to allow Pakistan the historic withdrawals. The transition period would be supervised by a temporary cooperative administration and end with the completion of link canals that would make up for Pakistan's loss of water allocations from the Eastern Rivers. Furthermore any infrastructure development costs would be paid by the benefitting country. Following Lilienthal's vision for the region, the initial plan was to solve the dispute sooner rather than later, however Pakistan felt the World Bank favoured India's



agenda. As a result, the Bank's proposal was quickly accepted by India (March 25, 1954), while Pakistan pointed out the issues with the inadequate compensations for the loss of water from Eastern Rivers. Pakistan explained that their limited storage capabilities could not support the development and growing population needs. Taking these consideration into account, the World Bank then published a revised Aide Memoire. (Biswas 2009) More negotiations were held, but in the end, due to the development plans and irrigation needs, neither side could afford the dissolution of talks, so in September 1960 the IWT, was signed by the Prime Minister of India, Shri Jawaharlal Nehru, and the president of Pakistan, Field Marshal Mohammad Ayub Khan. (World Bank 1960)

According to the twelve articles of the agreement, unrestricted use and control over the three Eastern Rivers (Sutlej, Beas and Ravi) was given to India, with the exception of the 10-year transition period between April 1, 1960-March 31, 1970. For the duration of this period, India had to supply certain amounts of water to Pakistan (amounts specified in Annexure H of the IWT). On the other hand, exclusive control over the three Western Rivers (Indus, Jhelum and Chenab) was given to Pakistan. During the 10-year transition period framed in the treaty, canals and systems were to be built to make up for Pakistan's loss of water. A Consortium of Countries, assembled by the World Bank, and consisting of the United States, the United Kingdom, Canada, Federal Republic of Germany, Australia and New Zealand, paid for the lion's share of the expenses. In addition to that, India agreed to share the remaining costs with Pakistan. According to the IWT, India and Pakistan need to cooperate on all matters regarding the treaty and share all relevant data. The biggest part of this cooperation is done through the Permanent Indus Commission (PIC), which has so far survived three Indo-Pakistani wars. (Transboundary Waters 2007) If the PIC cannot resolve the disputes, they need to be referred first to a neutral expert,

and if necessary to the Court of Arbitration. These conflict resolution mechanisms are specified in the Article IX and Annexure E and G. (Biswas 2009) In line with these conflict resolution mechanisms, in 2010, Islamabad appealed to the Permanent Court of Arbitration in The Hague, voicing its fears that India's plans for Kishenganga Dam would give India too much power over the waters of the Neelum River. After three years, the court ruled in India's favour. (Permanent Court of Arbitration 2013)

The treaty is an often referenced example of successful joint water management, however, more recent events suggest that, even in this case, water cooperation and conflict coexist.

### 3.2. DEVELOPMENT AFTER 2014 – “Narendra Modi era”

For decades there has been little coverage or scholarly attention paid to the water issues between India and Pakistan, probably because of the prevailing opinion that the Indus Water Treaty successfully regulated the situation. After this relatively quiet period (this is not to say that there were no issues!), the following paragraphs will focus on the period since 2014, when Narendra Modi took the office of Indian Prime Minister. Modi's approach to the water disputes will be portrayed through news articles and the Indian government's statements published on their website.

In 2015, Pakistan's regular blackouts brought attention to the country's insufficient energy infrastructure and together with the imminent water shortage issues, Pakistan has made it to the covers of many international media channels. The country's water supplies started plummeting partly due to the effects of global climate change, and on the other side domestic infrastructure, mismanagement and wasteful use. While the government identified mostly domestic issues, some conservative Muslim groups continuously accused India of so-called “water terrorism”. Despite their differences, they all agreed

that the situation is getting worse. The representatives of Pakistani government, such as the minister for water and energy, Khawaja Muhammad Asif, warned that Pakistan could face a total water shortage in the next decade. (The Diplomat 2015, New York Times 2015, Asian Development Bank 2013)

In August 2016, Islamabad again voiced its concerns over the Kishenganga and Ratle hydroelectric plants. According to the established procedures, they first directed their appeal at the Indian government. The Request for Arbitration was later addressed through the World Bank's Court of Arbitration. The Bank committed to a timely resolution; however, the India-Pakistan relations soon faced a new challenge. (Government of Pakistan 2016) On September 18, 2016, four terrorists (assumed to be from the Pakistani Jaish-e-Mohammed jihadist group) attacked near the town of Uri, in the Indian-administered state of Jammu and Kashmir. It was reported as "the deadliest attack on security forces in Kashmir in two decades", as they killed 17 soldiers. (BBC 2016) Shortly after that, the Indian PM Narendra Modi said "Blood and water can't flow together" and therefore India will "try and exploit to the maximum" the Indus river. (The Times of India 2016) At the meeting between both countries' Water Resources and External Affairs Ministries, India decided to suspend further annual water talks of the PIC and at the same time increase maximize utilization of India's legal water share until "the terror comes to an end". In response to that, the foreign affairs advisor to Pakistani Prime Minister Nawaz Sharif said revoking the IWT could be perceived as an "act of war," and he hinted that Pakistan might seek assistance from the United Nations or International Court of Justice. (Foreign Policy 2016) At the same time, Modi has also worked on indirect support for helping Afghanistan develop its eastern rivers (Kabul, Kunar and Chitral), which would again have very direct consequences for Pakistan's

water supplies. (Pakistan Today 2016) Soon enough, Modi's actions and statements were taken by the international and local media, spreading his rhetoric of "turning Pakistan into desert", "water that belongs to India cannot be allowed to enter Pakistan", and criticizing previous governments for ignoring Indian farmers' needs and allowing India's legal shares of water to go to waste. (The News International 2016) These words were accompanied by a high-level meeting of Indian officials, where they established a new government inter-ministerial task force, whose primary aim was to review the Indus Water Treaty and prevent India's shares of water to wastefully pass to Pakistan and then into the ocean. To this end, this same meeting then provided an official decision to fully utilize India's legal water shares. (The Times of India 2016)

In January 2017, Narendra Modi addressed this issue at his first rally in Punjab, where he promised the local farmers the so far unused India's water share from the Indus River. (The Times of India 2017) On March 21, both countries started a new round of negotiations in Pakistan's Islamabad, however to this date, no concrete conclusions have been announced. Some sources even report India's disappointment with the event's agenda – more specifically, Pakistan's attitude of not addressing the issue at hand. (Pakistan Today 2017, Pakistan Today 2017) At the same time, others report the two countries did address some of the water issues, e.g. Pakistan formally requested India to share the plans for new hydro projects in Kashmir, as well as allow Pakistani experts to examine the construction site. Reportedly, India has so far refused both of these two requests (Hindustan Times 2017), instead of improving transparency and data sharing in this contested issue. According to other newspapers, India has shown a rather rigid position on the Indus Water Treaty, insisting on the current provisions. (The Times of India 2017) Prior to the meeting, Pakistan's minister for water and power, Mr. Khawaja

Asif, stated: “Respect and implementation of this agreement ... is in the interest of both countries and this region”. (Hindustan Times 2017)

At the same time, there have been growing tensions rising within India, for example between the states of Harayana and Punjab. Villages in Harayana have suffered from drought, reportedly because of India’s unutilized water provision specified in the IWT. According to many Indian government officials, this water goes to waste by flowing from India, through Pakistan and into the ocean. (Hindustan Times 2017)

### 3.3. ANALYSIS

This section of the thesis is dedicated to the analysis of Indo-Pakistani water interactions over the Indus River Basin under the Indus Water Treaty. The analysis consists of several parts:

First, it sums up the background chapter and presents the important events on a timeline, starting with the partition of British India in 1947, and ends with the start of a new round of IWT negotiations.

Second, it uses the TWINS matrix to present and then re-evaluate the nature of the transboundary water interactions. It uses official documents and news reports to create a narrative of water interactions, and challenges the prevailing opinion that, until recently, Indio-Pakistani water relations under the IWT have been a success story.

The last part aims to seek out the reasons for these interactions, and it does so by examining the two actors and their relative power. The argument is that the power asymmetry creates a unique downstream-upstream riparian dialogue.

The timeline below visualizes the information that was presented in the previous subchapter. This presentation of information could lead us to a conclusion that after two

relatively short-standing agreements, the Indus Water Treaty managed to survive three major Indo-Pakistani wars over the last fifty years. So far, the treaty is still in place, despite Modi's controversial move in October 2016, when he decided to suspend the annual meetings of the Permanent Indus Commission. After months of uncertainty, the leaders of both countries got together in Islamabad and started a new round of negotiations. These latest developments in March 2017 give hope for survival of the IWT, however, so far neither government has commented on the content or nature of the meeting.

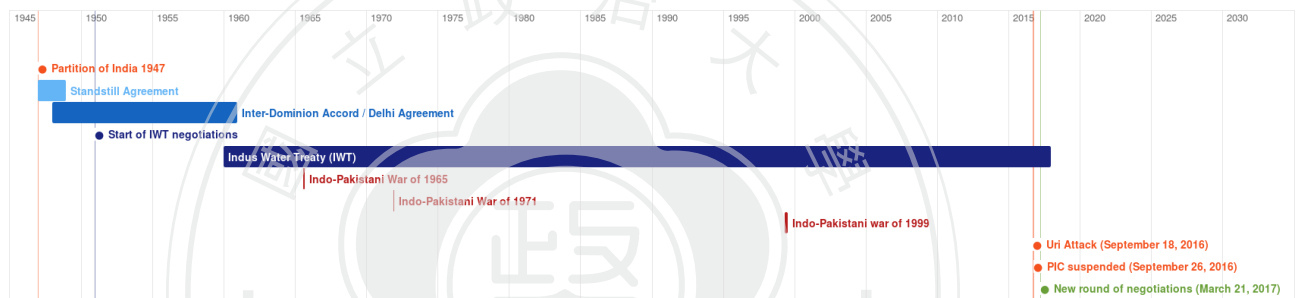


Figure 8 Timeline of important events in the Indo-Pakistani water interactions

In applying the TWINS matrix, the first step is to transfer the timeline information to the two-dimensional matrix. The timeline gives us an accurate representation of the sequence; however, it might mislead us into thinking that periods with different agreements in place were times of no conflict. Therefore, in addition to the information that a timeline can give us, the matrix draws reader's attention to the previously unseen aspects – the coexistence of conflict and cooperation.

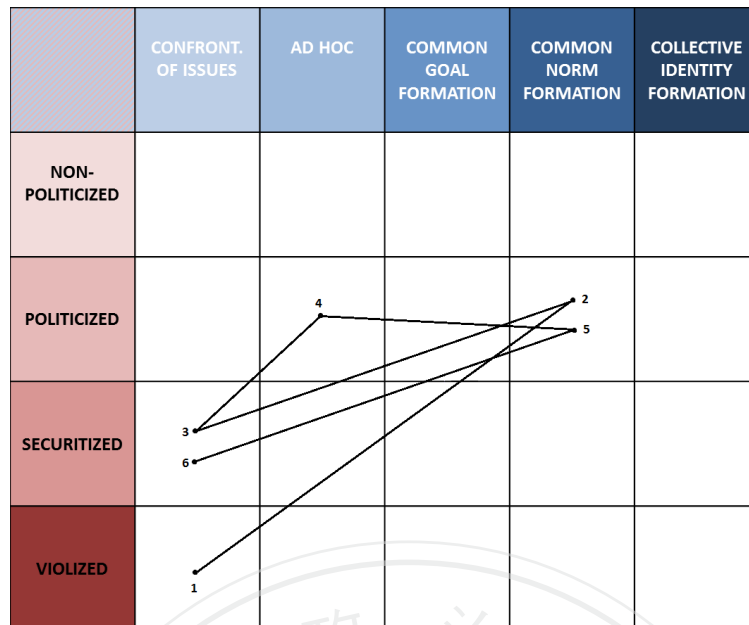


Figure 9 TWINS representation 1: Timeline of important events in the Indo-Pakistani water interactions

**Point 1** represents the post-partition situation between August and December 1947. The water scarcity issues are just another aspect of conflict between the two new states. Hostilities occur even (but not exclusively) over the rare water resources. India and Pakistan both acknowledge the issue of water scarcity, and deal with it on a domestic level, so their actions are not coordinated or cooperative.

**Point 2** marks the Standstill Agreement of December 1947, which established first regulations regarding the sharing of Indus waters between India and Pakistan. The agreement alleviated the conflict, but due to its temporal nature, failed to remove water security from the political agenda. Both sides were aware of the still-existing differences of opinions and the very short time they had to resolve them – the Standstill Agreement was to expire on March 31, 1948.

**Point 3** shows us what happened immediately after the agreement expired: on April 1, 1948, India shut off water supplies to Pakistan. Prior to that event, neither side made an

effort to negotiate a new deal or even to extend the Standstill Agreement, so India could legally stop supplying water, thus sending a clear message to Pakistan: no agreement, no water.

**Point 4** takes us to May 4, 1948, when India and Pakistan signed the Inter-Dominion Accord. Faced with the merciless reality of India's water politics, Pakistan initiated a new round of negotiations. Due to time limitations, the Inter-Dominion Accord mostly followed the previous Standstill Agreement, with some minor changes. The short text of the agreement quickly recaps the situation, showing that India's East Punjab believes to have sole ownership of the Indus waters, while West Punjab under Pakistan references international law to support its river claims. The accord states that in exchange for payments, India will keep releasing water to Pakistan, but slowly decrease the amounts, to allow Pakistan enough time to a smooth transition to tapping other water sources. (Commonwealth Legal Information Institute 1948) The urgency of the situation pushed Pakistan to sign an accord that was clearly not in their best interest. Due to their ongoing dissatisfaction with the agreement provisions, the Inter-Dominion Accord was seen as another temporal solution, and despite setting up a water regulation system, it is questionable if it actually formed common norms or goals, therefore the author argues that the agreement can be classified as ad-hoc joint action. Two years after the agreement was signed in 1948, negotiations were started to find a more permanent solution based on shared goals and norms.

**Point 5** is a considered a milestone in Indo-Pakistani water interactions – the Indus Water Treaty. After almost a decade of negotiations, the IWT was signed on September 19, 1960. It established new regulations, joint data sharing and revision bodies, as well as



conflict resolution mechanisms. In contrast with the previous two agreements, the IWT really does seem to have established common norms and actions to achieve the ultimate goal, water security. The treaty provided safeguards even in times of three Indo-Pakistani wars, and was therefore seen as a shining example of transboundary water cooperation. The matrix shows that overall, the treaty did not remove the water security issues from the political agenda. However, it did prevent securitization or hostilities over the Indus River and its tributaries. The treaty has been in place for nearly 60 years, but events in 2016 have brought some serious strains over the treaty's implementation.

**Point 6** shows us how, after the Uri attack in September 2016, Modi's rhetoric and actions of suspending the Permanent Indus Commission have shifted the interaction back to the domain of securitization. So far, the water supply to Pakistan has not been cut off (and as we have seen in the previous chapter's Pakistan would interpret this as an act of war), but it is safe to say that official statements show the common norms and goals might not be there anymore. We can observe this in both Pakistan and India's statements, referring to the other side as the "terrorist side", thus clearly differentiating between their supposed values and norms. At the same time, India's goals have started leaning towards providing the local population with water and if necessary, this goal could override the IWT.

The first TWINS matrix showed the conflict and cooperation aspects of Indo-Pakistani interactions since 1947. The next one will take a better look at the events under the Indus Water Treaty, with aim to accurately present the nuanced interactions and oppose the prevailing view that ITW is solely a matter of cooperation.

Some of the statements used for this part of the analysis have been taken from the Indian Pakistani government websites, although it is worth mentioning that their online press release databases only go as far back as 2000. For that reason, the author decided to complement the official statements with news reports, and to focus mostly on the 21<sup>st</sup> century and most recent developments between 2000 and 2017.

One of the first recorded disputes is that of the Salal Dam in 1987, which was eventually amicably resolved through bilateral negotiations. Some other projects, such as the Wullar Barrage/Tulbul Navigation Project, and the Baghligar Dam on Chenab River started a much longer dispute, straining the countries' relations from mid-1990's up until now, with Pakistan opposing its construction, but not being able to prevent it. In 2006, Indian government issued a press release regarding the Tulbul Navigation Project, explaining its legality as a navigation facility (as opposed to storage facility, as claimed by Pakistan) and its non-consumptive use of water, thus posing no threat to downstream Pakistan's water availability. (Government of India 2006)

In light of the post Uri Modi rhetoric, Islamabad has restated its concerns over using this dam as an instrument of coercion. (Dr. Shaheen 2010, The Times of India 2004) The 1988 floods that hit India and Pakistan, revealed even more issues on water management, thus starting a separate round of public accusations and, eventually, agreement on sharing water data to prevent future devastating floods. (Dartmouth University 2003)

Securitization act has been present in many official statement and speeches, thus shifting the Indus Water Treaty from a political agenda towards securitized issue. Between 2009 and 2017, Pakistan has been continuously accusing India of manipulating or even breaching the Indus Water Treaty. With the supporting statement from the UN (e.g. the

world is on the brink of the first water war), Pakistani officials and people have been accusing India of illegally storing Pakistan's water. The government warned that such actions could fuel extremism, terrorism, or even war, however, India responded that the post Mumbai terrorist attacks period is not the time to be discussing water issues, when India is already being threatened from within Pakistan. In addition to that, the Indian government's press release described the theft allegations as "baseless". (The Independent 2009, Government of India 2010) The water theft accusations continued in 2011, adding that India has been benefitting from the unjust IWT provisions, mostly by dam construction works on Chenab River. Pakistan government representatives and U.S. diplomatic envoys to India and Pakistan seemingly agreed that these dams would put further strain on the Indo-Pakistani relations, while India denied having received any flow reduction concerns from the Pakistani government. (Pakistan Today 2011, Pakistan Today 2011) Members of the Pakistani parliament have continued with their rhetoric, e.g. saying India aims to make Pakistan a barren land and destroy Pakistan's agriculture, by blatantly violating the IWT. Therefore, Pakistan could brace itself for future famine, unless something was done to address the issue. (Pakistan Today 2012, Pakistan Today 2012, Pakistan Today 2013) The government press release confirmed these fears and pointed at three main factors for water scarcity: Indus Water Treaty, decline in transboundary flows into Pakistan, and population growth. (Government of Pakistan 2014) The media went on with blaming India for destructive floods, again with the supposed goal of destroying Pakistan's agriculture. (Pakistan Today 2014, Pakistan Today 2014) It is noteworthy here that Narendra Modi came into power in 2014, and as already described in the background subchapter, he started a much more responsive rhetoric, compared to the previously relatively silent Indian government.

After the Uri attack in September 2016, Modi's statements to use water as a weapon against Pakistan's terrorism were met by (unsurprisingly) strong opposition from the downstream neighbor. In November 2016, Pakistan even warned against such coercive measures and instruments of war at the UN Open Debate of the Security Council on "Water, Peace and Security". (Government of Pakistan 2016) While India talked about questioning and revising the Indus Water Treaty, Pakistan firmly stood its ground of keeping the treaty without any modifications (Pakistan Today 2016), which seems to be in contradiction with their previous statements where they blamed the treaty for the water scarcity issues.

**Point 1** on the TWINS matrix representation below shows us how the IWT established common norms, but left the water issues on the political agendas in both countries. Many of the disputes that have arose since 1960 have either securitized water issues, but kept the common norms (e.g. Salal Dam) as represented by **point 2**, or securitized the issue and regressed to common goals, with different preferred and even pursued approaches to the issue. These cases, represented with **point 2'**, include flood management, and India's hydropower construction on Chenab River, etc. Similar to the TWINS matrix above, **point 3** shows us how, after the Uri attack in September 2016, Modi's rhetoric and actions of suspending the Permanent Indus Commission have shifted the interaction back to the domain of securitization. So far, the water supply to Pakistan has not been cut off, and the technical data sharing mechanism are still there, however, the PIC has been suspended and as discussed in the first TWINS representation above, the common goals and norms seem to have dissolved.

	CONFRONT. OF ISSUES	AD HOC	COMMON GOAL FORMATION	COMMON NORM FORMATION	COLLECTIVE IDENTITY FORMATION
NON- POLITICIZED					
POLITICIZED				1	
SECURITIZED	3		2'	2	
VIOLIZED					

Figure 10 TWINS representation 2: Indo-Pakistani water interactions under the IWT

The two TWINS representations of Indo-Pakistani water interactions show us that while there have been improvements on cooperation, some aspects of conflict have continued on, with little hope for their resolution. One of the questions that come to mind is: has the treaty given all that it possibly could, and has now become outdated? If so, why has it not been renegotiated, to accommodate the increasing demand, climate change, etc.? The next paragraph will dive into the power asymmetry, in hope that the two countries relative economic and military power can explain why the treaty remains in its original and perhaps already obsolete form. The relative power will be outlined in this section, and the used to compare the power asymmetry in the Indo-Bangladeshi water interactions (Chapter 4).

The financial power can be understood by looking at the two countries' GDP. According to the World Bank data from February 2017, measured in millions of international dollars, India ranks number three in the world, with the GDP value of 7,998,278. On the other hand, Pakistan sits 21 places lower, with GDP value of 946,667. (World Bank 2017) This massive difference can explain why India can invest much more money into infrastructure

development projects, and why Pakistan is suspicious of these (compared to their) projects that could store humongous amounts of river water.

Military power is an important factor in Indo-Pakistani conflict-ridden relations. According to the World Bank, in 2015 India spent 2.4% of its total GDP on military expenditure, while Pakistan spent 3.6%. (World Bank 2017) Both countries possess nuclear weapons, making war even more of an extremely undesirable outcome. (Arms Control Association 2017) It is worth mentioning, that in addition to Pakistan's military power, there are certain terrorist groups who have put water security on their agenda. (Stanford University 2016, The Telegraph 2010) According to Modi's rhetoric and vilification of Pakistani terrorism, hardly any benefits could be expected from terrorism activities to coerce India into releasing more water.

INDICATOR	INDIA	PAKISTAN
POPULATION <sup>2</sup> (2015)	1,311,050,530	188,924,870
GDP (2017) <sup>3</sup>	7,998,278	946,667
MILITARY EXPENDITURE (% OF GDP IN 2017) <sup>4</sup>	2.4	3.6
TOTAL MILITARY EXPENDITURE IN USD (2017) <sup>5</sup>	51,000,000,000	7,000,000,000
NUCLEAR WEAPONS (2017) <sup>6</sup>	YES	YES

Figure 11 Summary table: India and Pakistan socioeconomic indicators

India's alliance with Afghanistan was already mentioned in the previous subchapter, so it is important to add that Pakistan has strong regional allies as well. China and Pakistan

<sup>2</sup> (World Bank 2016)

<sup>3</sup> (World Bank 2017)

<sup>4</sup> (World Bank 2017)

<sup>5</sup> (Global Fire Power 2017)

<sup>6</sup> (Arms Control Association 2017)

have been working together on a series of economic and development projects, known as the China-Pakistan Economic Corridor (CPEC). India has already raised its concerns over this project, and the Sino-Pakistani friendship could also pose a problem in water supplies to India – the Indus and its tributaries originate in China-administered Tibet, making China the ultimate upper riparian. Because there are no bilateral agreements between China and India, China could answer India's unilateral actions targeting Pakistan's water security, by responding in an equal measure, while at the same time not breaching any agreements. (Al Jazeera 2017, Pakistan Today 2016)

Last but not least, the population growth in both countries means that the demand for water resources will continue to rise. In 2015, the population of India grew at a rate of 1.2%, and 2.1% in Pakistan. (World Bank 2017) It is therefore unsurprising, that the politicians need to reassure their voters and convince them that water security (as one of the most tangible issues for Pakistani and Indian people) is one of their top priorities. Modi's strongly worded opinions on this issue could also have helped in his 2017 Assembly Election campaign,

Looking at the information presented above, India seems to be relatively stronger in terms of both finance and military power, in addition to having the geographic advantage of an upper riparian. However, Pakistan does have a powerful regional ally in China, as well as the internationally accepted treaty to use as a defense mechanism. If Pakistan is not willing to go into war over water resources, their best option is to hold India accountable in the international arena and, much to India's discontent, keep involving third parties in dispute resolution process. While renegotiating the treaty to meet the needs of present times would be beneficial to both India and Pakistan, it seems that so far, both states prefer to stay with the original agreement. The difference between the two countries'

position seems to be that India wishes to exploit it to the legal maximum, and Pakistan opposed any increases in India's water consumption, even if they are in line with the agreement.

### 3.4. POLICY RECOMMENDATIONS

According to the international community, and even the two involved countries, the water issues over the Indus River Basin between India and Pakistan were settled in 1960, and have since only been a matter of compliance with the Indus Water Treaty provisions. However, the past decade has shown that the continuous increase of water demands on one hand, and the unresolved tensions between the two countries have proven that the treaty in itself does not build sufficient trust for meaningful and sustainable cooperation. The Indus Water Treaty therefore provided the two states with water in the past, but has gradually become less efficient. This increasing water shortage has then fed the existing lack of trust on both sides, leading up to the height of water tensions since the September 2016 Uri attack. The author believes that the main reasons for the IWT's failure are:

- The treaty does not accommodate the changing conditions, and with that, it pushes the countries towards unilateral and borderline interpretations of the treaty provisions. The treaty has never been updated, thus still relying on the same data as when it was signed, despite having monthly data sharing mechanism in place.
- The treaty and its supporters have been focusing on how the treaty has survived wars, instead of evaluating its primary function: to provide both sides with sufficient amounts of water. For the sake of building overall peace, any action that could lead to another round of lengthy negotiations has been discouraged, until post Uri-attacks Modi's rhetoric.



**First recommendation is therefore to reconsider the treaty's provisions and start a fresh round of (multilateral) negotiations.** India's incentives to renegotiate the treaty seem obvious: the population has been growing<sup>7</sup> and with it water consumption needs for drinking, agriculture, energy, etc. So far, India has not even fully utilized its legal shares, however, it is important to remember that the water allocations were decided half a century ago, when water availability and needs were different from today's. What used to be reasonable amount of India's legal water shares in 1960, might mean water catastrophe for the downstream Pakistan today. At the same time, any drastic measures on the Indian side could be interpreted as acts of war, not only by the government, but also by the many militant groups. Terrorism seems to be the key factor for the future of IWT. Narendra Modi has made it clear, that Pakistan's efforts to stamp out terrorism will be reflected in the water sharing reality between the two states. (Global Risk Insights 2016)

Pakistan has a great incentive to renegotiate the treaty as well, however, the official statements referenced in the previous chapters suggest that for now, both countries support the current IWT. The experience of lengthy negotiations might have left a bitter memory, thus making the option of going through another similar process an unlikely choice. The rational choice for India, under current conditions, is to capture as much of water resources as legally possible, while for Pakistan, their preferred rational choice seems to be appealing to the international community. (Government of Pakistan 2017) An alternative needs to be offered: a multilateral, basin-wide agreement that would first and foremost provide the dependent local communities with enough water, and then provide for the region as a whole. More emphasis should be put on benefit sharing and given the circumstances, a third-party mediator might be required for successful planning and implementation. To achieve this, Pakistan should keep putting pressure on India through

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<sup>7</sup> In 2015, the growth rate was 1.2%. (World Bank 2016)

international institutions and try to engage its ally China to persuade India into a new round of negotiations.

With IWT, the length of the process seems to have led to a “bad agreement is better than no agreement” attitude, which should not be the case in the future. India’s reluctance to enter into multilateral agreements might be changed by China’s increasing hydro-project planning on many rivers, including the rich Himalayan sources that feed the whole South Asia. Another issue that must be addressed here is China’s general rejection of joint water management concepts, and support for upper-most riparian’s absolute power over transboundary waters. (Chellaney 2013) Unless India accepts multilateral approaches and perhaps even uses its leverage to convince China to join, India has no guarantee that China will keep letting sufficient amounts of water flow downstream, when resource capture could solve many of China’s own domestic water issues – and at the same time, heavily impact India.

**To make the new agreement more sustainable, it should contain the following mechanisms: flexible allocation strategies; drought provisions; amendment and review procedures; and joint management institutions.** (Cooley, Christian-Smith and Gleick 2009) These mechanism would ensure both India and Pakistan sufficient amounts of water, thus alleviate water-related social tensions within and between the two countries.

**Before starting the new, basin-wide multilateral agreement negotiations, the two countries need to first review and modify the existing IWT, so that it could serve them during the transition period.** The modified IWT should rely on the new water availability and demands data, and take into account possible future scenarios (e.g. impact of climate change). While India seems to prefer status-quo, it should be reminded that the IWT cannot accommodate its growing needs and at the same time uphold international

cooperation on the issue. Breaching the agreement would seriously impact India's position in the international arena, therefore renegotiating and complying with a treaty are the most rational choice.

**On the domestic level, the two governments should continue, and perhaps accelerate, transitioning to less water-intensive crops and industries, and build their economic growth around the concept of sustainable development.** Less water demand will lead to less tension surrounding the limited resources.

**Another challenge that should be stopped immediately is privatization and commercialization of water resources.** In Pakistan, Nestlé has already launched a business of buying groundwater and selling it back as their bottled product Pure Life. (Rosemann 2005) One of the possible solutions would be to include water in the constitutional rights, thus preventing private ownership and unequitable access to the scarce water resources.

## 4. CASE STUDY II: WATER SHORTAGE IN INDIA- BANGLADESH RELATIONS

### 4.1. BACKGROUND

The seasonal differences in rainfall and the regional mismanagement of river flows are at the core of water issues in the Indian subcontinent. More specifically, water issues between the two areas that are now known as India and Bangladesh started under the British Raj (1858-1947), when the Kolkata port was built for river transport to and from the inland. The port was built on the Hooghly River, which used to be the main course for the Ganges, before the latter river shifted eastwards towards the Bengal Delta. Consequently, the river transport on the Hooghly River was almost non-existent during the dry season. To address this issue and to keep the Kolkata port alive, in 1975 India built Farakka Barrage - a diversion canal to bring back the much needed river flow that would flush out the deposited sediments during the dry season. While this saved the Kolkata port, the surrounding industry and livelihoods of 100 million Indian people, it merely relocated the water scarcity issues to Bangladesh. (Hanasz 2014, The Water Page 1996, Dr. Mital 2016) At that point, the construction of the barrage had been more than 20 years in planning.

Starting in 1951, Pakistan<sup>8</sup> repeatedly called for a closer collaboration on the project. Their proposals suggested two main clauses. First, inclusion of the UN advisory and technical bodies in the planning process e.g. request the UN Secretary General to appoint engineers to participate in the meetings. Secondly, Pakistan called for a joint expert

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<sup>8</sup> East Pakistan fought the independence war from Pakistan much later, in 1971, and resulted in establishing the People's Republic of Bangladesh.

examination before implementation. While India refused to meet Pakistan on these demands, it agreed on data exchange for projects of mutual interest, which led to expert-level meetings starting on June 28, 1960. Seven months later, while these meetings were still in progress, India informed Pakistan it started with the construction of the Farakka Barrage. All efforts by Pakistan to organize a high-level political meeting were to no avail. In 1963, both countries agreed to an expert-level meeting, which was then organized five years later in order to prepare the necessary data for a minister-level meeting. By that time, Pakistan has given up on meaningful data-sharing cooperation, but insisted that enough data was available for the high-level political meetings to commence. India agreed to a limited scope of these meetings, which were eventually held in 1968-1970, and clearly showed the different visions for river management. The meetings displayed a clear pattern of lower riparian versus upper riparian power struggle, with Pakistan pressing for an equitable water distribution under the supervision of the permanent Ganges Commission and mechanisms of dispute settlement in accordance with international standards, and India merely focusing on data sharing accuracy.

The fifth secretaries-level meeting in July 1970 ended with three recommendations, namely: First, Farakka will serve as a water delivery point to East Pakistan. Second, both sides found it acceptable that a body consisting of representatives from both countries could supervise this delivery. Second, the quantum of water to be delivered at Farakka would be decided in 3-6 months, at a meeting which level was yet to be decided by the two governments. This meeting would also address other unresolved issues. In reality, these concluding recommendations did not have much impact on the course of events. (Wolf and Newton 2007)

Shortly after the independence in 1971, the newly established Bangladesh expressed its wishes to continue working on the Ganges River issues. In 1972, Bangladesh and India established the Indo-Bangladesh Joint River Commission, which addressed management of common rivers with specific exclusion of Ganges – this would only be handled between the two prime ministers. Preparatory meetings at the minister-level resulted in the promise that the Ganges issues would be solved through a mutually acceptable solution, before Farakka starts operating.

The prime ministers met in 1974 and came up with an important observation, that during the low-flow periods, the water quantity may not be sufficient to provide for both Indian and Bangladeshi needs and therefore the river would need to be augmented. The process of doing so would be further specified and supervised by the Joint River Commission, together with the water allocation quantities.

Each of the two countries has had a different vision regarding the augmentation, with India continuously proposing water diversion from Brahmaputra and Bangladesh preferring augmentation through storage facilities within the Ganges basin. (Wolf and Newton 2007)

The next couple of meetings crystalized two countries differing positions, as summarized in the table below:

BANGLADESH	INDIA
Adequate storage potential of monsoon flow is required to meet the Indian needs, without taking from Bangladesh's piece of cake.	Additional storage potential is limited and therefore insufficient to meet Indian needs.
Nepal should participate in this project, as additional storage needs to be built on	The Joint River Commission cannot accommodate negotiations with another

Ganges tributaries in Nepal.	party.
Diversion of waters from Brahmaputra to Ganges would be too detrimental for Bangladesh (possible mass relocations).	Diversion and storage of waters from Brahmaputra would be the most optimal solution with benefits for both sides.
Better solution would be amending the existing diversion canal to Hooghly River and constructing a navigation link from Kolkata to the sea via Sunderban.	The Commission cannot discuss amendments for Hooghly River diversion links. Construction of the navigation link is irrelevant to the regional water development issues.

(Wolf and Newton 2007)

In 1975, the countries agreed to trial run for Farakka Barrage in low flow season, with 11,000-16,000 cusecs discharge in 10-day periods between April 21 and May 31. Any extra flow was guaranteed to Bangladesh. After this trial run period finished, India extended its diverting operations at Farakka, without further negotiations or agreements. This time, however, India withdrew the maximum of 40,000 cusecs, even during the dry season, which resulted in salination along the coast, desiccation of Ganges tributaries and consequential issues for agriculture, industry, fisheries and navigation – all for Bangladesh to deal with. (Bandyopadhyay and Ghosh 2016) Due to India's unilateral actions, Bangladesh turned to the General Assembly of the UN and filed a formal complaint in January 1976. Ten months later, the UN responded with a statement encouraging a ministerial-level meeting to re-start the negotiations for a fair settlement. The two countries thus restarted the water talks in December 1976, and in the following April, they reached an understanding on the most fundamental issues. The progress has been accredited to India's new government under the leadership of Janata Party, whose priority was to settle discords with India's neighbours. (Hossain 2010)

This April meeting was then supplemented and formalized in the Ganges Water Agreement (GWA), which was signed on November 5, 1977. This first official agreement

between India and Bangladesh covers the sharing of water at Farakka Barrage, as well as finding a long-term solution for the much-contested topic of Ganges augmentation during the dry season. The agreement also started a tradition that is still respected in the present times: using the 75% of recorded flow between 1948 and 1973 to establish the average dry season availability and with it the fixed water allocations. The GWA also established a practice of minimum water withdrawals between Farakka and the Bangladesh border as well as the provisions for a Joint Committee to supervise the implementation, write annual reports and provide data sharing. Conflict resolution was also within the Committee's scope of duties, as they were to examine any related issues. If the Committee failed to provide a viable solution, a joint and equally represented Indo-Bangladeshi panel of experts nominated by the two governments would be entrusted with the issue. (Rahman 2006)

Initially the agreement was signed for five years, with hope that the Joint River Commission would in the meantime work out a long-term solution, however members of the Commission from both sides again presented very different, and incompatible ideas. After the five years, India and Bangladesh both agreed not to extend the 1977 GWA and instead start the negotiations anew. Further negotiations and failed attempts at finding this elusive long-term solution again emphasized different visions between the two countries, with Bangladesh pushing for inclusion of Nepal, and India focusing on linking the Ganges with Brahmaputra and keeping the negotiations with Bangladesh strictly bilateral. India's hardened stance again came from the change in government, when the latest election results passed the torch back to Indira Gandhi. (Hossain 2010)

Between 1982 and 1996, little progress was made and the last eight years before 1996, India and Bangladesh had no agreement on the Ganges River sharing and management.



This also meant that Bangladesh's water share was completely dependent on India's good will. In 1996, however, the two parties found themselves at the negotiations table once again, this time to sign the 1996 Ganges Water Sharing Treaty (GWST), based on the 1985 accord. (Wolf and Newton 2007) The treaty will expire in 2026. (Government of the People's Republic of Bangladesh 1996)

The new Ganges Water Sharing Treaty differs from the previous accord in the water distribution scheme at Farakka Barrage for the dry season – January 1 to May 31. The water quantities for each country were decided as shown in the table below.

Flow amount	India	Bangladesh
< 70,000 cusecs	50%	50%
70,000 - 75,000 cusecs	Balance of flow	35,000 cusecs
> 75,000 cusecs	40,000 cusecs	Balance of flow

Figure 12 Ganges Water Sharing Treaty water allocations (Wolf and Newton 2007)

The worst-case scenario (flow below 50,000 cusecs) dictates the two governments and the Joint Committee to meet and decide on the appropriate actions, based on equity and no harm to either party. The problem is that this clause was based on now heavily outdated numbers – with current water consumption, Bangladesh hits a crisis point much earlier than at the established 50,000 cusecs minimum. The sharing arrangements specified in the treaty are also subject to reviews at five-year intervals. If parties cannot come to an agreement, India is required to release at least 90% of Bangladesh's flow at Farakka. The most notable shortcoming of the treaty is that it does not cover extreme events and upstream uses, thus completely ignoring China, Nepal and Bhutan's development plans and their impact on the agreement. The second notable flaw of the agreement is that it is still based on water discharges data at the Farakka between 1949 and 1988. (Mirza 2006, Wolf and Newton 2007)

The first notable dispute occurred in April 1997, when the water discharge at Farakka dropped below the minimum amounts specified in the treaty. Bangladesh received a shy one sixth of the water that was promised upon signing the treaty a couple of months ago, and this shortage led to angry accusations of cheating by the Bangladesh officials and protests organized by the locals of the most affected areas. India denied all allegations, but Bangladesh still requested a review of the situation. Luckily, the spring has eased the situation by delivering the melted snow from the Himalayas, however, this did not uproot the growing mistrust between the two parties. (Tanzeema and Faisal 2001, The New York Times 1997)

Since then, the flooding and drought have become a constant threat for many in Bangladesh. While there are plenty of news reports on these issues, there are very few official statements that would talk about the contested Ganges Water Sharing Treaty. (Government of the People's Republic of Bangladesh 2017)

#### 4.2. DEVELOPMENT AFTER 2014 – “Narendra Modi era”

As already described in the previous chapter, Narendra Modi has put the water shortage issue on top of his priority list. The situation on the Indo-Bengali border is no different in this respect, so Modi's government has shown great support for several strategies known under the name of *India's Mega River Linking Project*. Given that about 33% of Bangladesh's population depends on the Ganges River waters, tensions over India's ambitious projects are to be expected. (Kawser and Samad 2016)

In March 2016, India's state of West Bengal was hit by a record low watershed in the Ganges, causing, for the first time, a temporary shutdown of the local power station, consequential blackouts, as well as drying out taps of more than 1,000 households in the area. This has left India's water reservoirs at the 29% of their storage capability, and with the summer heat just around the corner, India has been on the lookout for more water resources and better distribution. (BBC 2016) The diversion of Brahmaputra's waters, an option that has been continuously opposed by the Bangladesh authorities, has made it to the top of Modi's plans to solve India's water scarcity issues. The plan, that has not been set in motion, has been heavily criticized not only for the impact it could have on Indo-Bangladeshi relations, but also on the local Indian populations and ecosystem. (The Guardian 2016) Another notable piece of information came from the Indian government in August 2016 and again February 2017, when Nitish Kumar, the Chief Minister of Bihar, requested the central government to demolish Farakka Barrage due to its detrimental effects on the local communities and inability to meet the expectations regarding Kolkata port. While the same request has been made by Bangladesh for more than a decade, this is the first time India is considering the proposal, but without engaging in any meaningful dialogue with Bangladesh. (The Daily Star 2017)

Bangladesh and India have been discussing projects on other shared rivers as well, with Teesta River conflict often making the headlines. (The Times of India 2017, Economic Times 2017) India's Bengal Chief Minister Mamata Banerjee has stated that Teesta River sharing treaty is impossible, since the river waters are too low to be shared between two parties. (Economic Times 2017) As discussed on the next pages, water protectionism (on any level) is not a sustainable solution and among other consequences, it can lead to displaced populations and increased civil tensions. Between 2000 and 2017, one database

has recorded 26 cases of violent civil conflicts in India alone, showing that fights over water resources are not unheard of and are therefore worth scholarly and political attention. (World Water 2017)

This case shares many similarities not only with the Ganges River dispute, but also with many other transboundary rivers between India, Pakistan and other neighboring countries. A well-structured, inclusive and sustainable model could therefore contribute well to the overall water sharing in the region.

#### 4.3. ANALYSIS

In the data presentation and interpretation of Indo-Bangladesh water interactions over the Ganges River, this analysis section follows the same structure as the one in the previous chapter. The analysis therefore consists of the following parts:

First, it sums up the background chapter and presents the important events on a timeline, starting with Bangladesh's independence from Pakistan in 1971, and ends with the expiration of the Ganges Water Sharing Treaty in 2026.

Second, it uses the TWINS matrix to present and then re-evaluate the nature of the transboundary water interactions. It uses the available official documents and news reports to create a narrative of water interactions, and challenges the prevailing opinion that, just like the Indus Water Treaty, the Ganges Water Sharing Treaty is a good model of transboundary water cooperation.

The last part aims to seek out the reasons for these interactions, and it does so by examining the two actors and their relative power. The argument is that the power asymmetry creates a unique downstream-upstream riparian dialogue.

The timeline below visualizes the information that was presented in the previous subchapter. With the treaty still being in place and no major conflict over it recorded, the timeline would have us believe that the treaty does seem to be beneficial for regional cooperation.

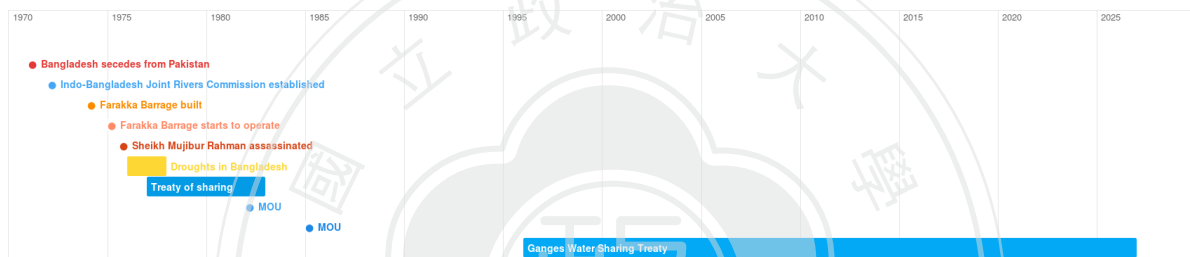


Figure 13 Timeline of important events in the Indo-Bangladesh water interactions

The matrix below now shows how this linear data sequence can be translated into the two-dimensional TWINS matrix, which gives us an insight into the coexistence of conflict and cooperation throughout the Indo-Bangladesh water interaction history.

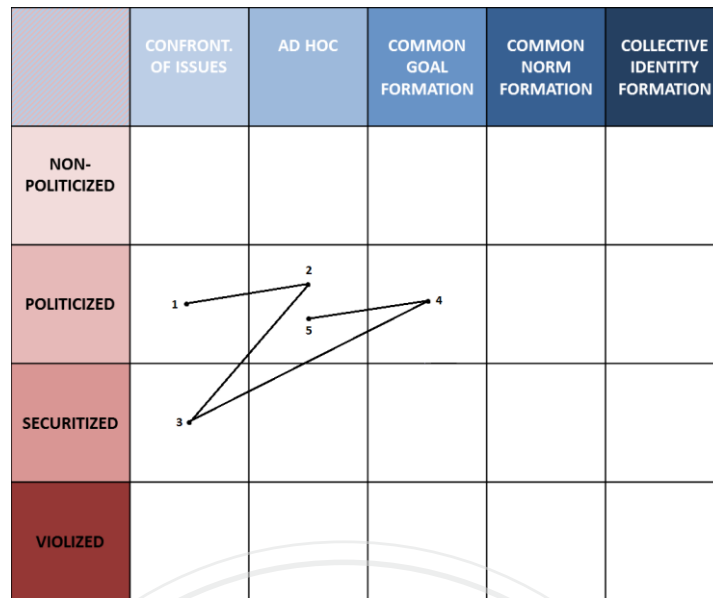


Figure 14 TWINS representation 3: Timeline of important events in the Indo-Bangladesh water interactions

**Point 1** represents pre-independence situation, when India and Pakistan could not find common grounds on the Ganges River issues. This changes soon after Bangladesh's independence, the 1972 Treaty of Friendship and the Joint River Commission established the new country's first ad-hoc cooperative mechanisms on transboundary water management with its neighbor India. The joint actions that were taken under these two mechanisms were driven by two sides' very different goals, which slowed down negotiation process in the years to follow (**Point 2**).

The water issues stayed on the political agenda, however, construction of Farakka Barrage in 1974 and its operations starting the next year pushed the issue on the securitized level of conflict intensity and regressing back to confrontation of issues without any coordinated actions, demonstrated with **point 3**. The tensions remained high due to India's unilateral water withdrawals, consequential droughts in Bangladesh and later the stalled negotiations after Sheikh Mujibur Rahman's assassination. In 1977, the two sides signed a new treaty, thus forming common water sharing goals to share the waters at Farakka Barrage, and removing the issue from the security agenda back into the

domain of “regular” politics, as represented by **point 4**. With two more memorandums of understanding and finally the 1996 Ganges Water Sharing Treaty, the India-Bangladesh water interactions have not changed drastically, with the treaty solving some of the issues, while not providing a solution sustainable enough, that it would remove the topic from both countries political agenda. Recent rhetoric and India’s unclear intentions show that the common goals have dissolved under the increasing domestic needs, therefore the author demonstrates with **point 5**, that the post-2014 interactions are still heavily politicized, while the treaty is providing some ad-hoc cooperation mechanisms.

The next TWINS matrix shows us water interactions under the 1996 Ganges Water Sharing Treaty.

	CONFRONT. OF ISSUES	AD HOC	COMMON GOAL FORMATION	COMMON NORM FORMATION	COLLECTIVE IDENTITY FORMATION
NON- POLITICIZED					
POLITICIZED		2	1		
SECURITIZED					
VIOLIZED					

Figure 15 TWINS representation 4: Indo-Bangladesh water interactions under the 1996 GWST

**Point 1** again shows where the countries stood at the time the treaty was signed in 1996. Some common goals regarding the water sharing were formed, however, the countries still left some issues opened due to their different preferred paths to solve them (e.g. augmentation from Brahmaputra). These issues left water issues on the political agenda,

showing that the Ganges negotiations, as well as still open questions on other rivers, are not satisfactorily solved. With the recent news of India considering demolishing Farakka Barrage, and some politicians publicly declaring that there is no excess water to be shared with Bangladesh, the general sentiment towards water issues in both countries could push the situation to securitization stage of conflict intensity, if followed by corresponding actions. Compared to Modi's very determined speech in the Indo-Pakistani case, these statements may seem fairly vague and isolated, however, the author argues they nevertheless create insecurity and can thus perpetuate further securitization, as represented with **Point 2** on the matrix above. While those who herald the treaty as the bringer of peace into otherwise unpredictable relations between India and Bangladesh, the treaty's shortcomings fail to reassure the two sides and provide a long-term solution.

The main question when rethinking the water interaction between India and Bangladesh is whether the treaty has been effectively addressing the water scarcity issues and has it been providing any solutions for domestic and international tensions. Some studies suggest that until 1991, Farakka Barrage has cost Bangladesh over 3 billion USD in agriculture, fisheries, forestry and other water-dependent sectors. (Kawser and Samad 2016) These numbers could lead us to believe that the water issues have been a source of tensions between the two countries, however, not many official statements can be found to support this assumption. Despite the lack of official statements and news reports directly on the water tensions, other matters (e.g. food security) are highly related to the transboundary water management.

The treaty is limited to sharing arrangements of Ganges at the Farakka Barrage – meaning it does not include any other upstream activities and diversions India might be exercising.



Flooding has been an ever-present issue in Bangladesh, only worsened by the Farakka Barrage construction. Despite this, the relevant treaty does not specify any flood alleviation provisions and the many consequences that come with excessive floods. (Hanasz 2014) India withdraws its allocated 40,000 cusecs, regardless of whether the total flow is the 75,000 cusecs (the amount specified in the treaty, see Figure 12), or twenty-times higher. Each year, the rivers in Bangladesh leave 200,000 people homeless. (Ismail 2016) Climate change is expected to first, increase the peak flow discharge, and on the other hand, make the dry season even dryer, enabling the salt water to intrude even higher upstream. (Rashedul 2015)

The problem of environmental refugees is familiar to India as well. Soon after the Farakka Barrage was built, the Ganges diversion turned much of the surrounding areas into river beds, displacing whole villages. (Dr. Mital 2016) The problems occur even further upstream: Since completion of the Tehri Dam in 2006, the surrounding Himalayan villages have been struggling to access sufficient water for basic needs, which has put fights over the remaining water supplies almost on a daily schedule. (Time Magazine 2010) In West Bengal, the erosion and floods of Ganges have displaced several thousand people. (The Hindu 2017)

When people are constantly victims to natural (and manmade) disasters like these, it falls on the shoulders of local and central governments to come up with a plan to mitigate the damage and prevent similar scenarios in the future. Not only do governments need to solve the problem, they also need to realize that environmental actions and reactions do not start and finish at their borders, therefore meaningful transnational dialogue is crucial for any long-term solution.

Internal disputes between Muslims and Hindus in both Bangladesh and India have been around for much longer than water scarcity; however, the increasing resource depletion had provided additional fuel to these ongoing conflicts. Combination of climate change, salination of ground water, and alternating floods and draughts could be a perfect recipe for disaster in Bangladesh. The problem of mass relocations of people from Bangladesh to India has not been settled either, and with the bloody history and uncertain future, not to mention Modi's statements that only Hindu migrants are welcome, more tensions can be expected. (The Diplomat 2014) Internal politics have a big impact on (including, but not limited to) the transboundary water talks. Good examples are Bangladesh's two main parties, the Bangladesh National Party (BNP) and the Awami League. While the first one is traditionally more critical of India and show less cooperative spirit on water sharing negotiations, the latter one has been behind all of the water agreements between India and Bangladesh, and is often criticized for being too lenient towards India's water policies. (International Policy Digest 2013)

Pollution of the Ganges is another issue, but unlike others, this one has seen some positive developments. The heaps of untreated sewage that used to be dumped into the river on daily basis have caught attention of local people and environmentalists. In 2017, the defenders of this holy river celebrated Indian state of Uttarakhand's court decision to grant the river same legal status as humans, which puts river pollution on the same legal level as harming a human being. (The Guardian 2017) While this move will improve the quality of the dwindling water quantity, it is only one of the many steps towards regional water security.

India's latest demands to demolish the Farakka Barrage show that common norms, goals and let alone identity are still weaker than selfish interests. When Bangladesh made the same request more than a decade ago, India dismissed the proposal, only to come back to it in 2017, but this time due to its growing domestic water issues.

When it comes to the relative economic and military powers of both countries, we are faced with another clear case of asymmetric capabilities. As mentioned in the previous case study, India's GDP is third highest in the world, with the GDP value expressed in millions of international dollars of 7,998,278. Bangladesh, on the other hand, lags behind its neighbor and is currently ranking 35<sup>th</sup>, with GDP value of 537,659 – which is about 56% of Pakistan's GDP. (World Bank 2017) The difference in military expenditure is quite significant as well. According to the World Bank, in 2015 India spent 2.4% of its total GDP on military expenditure, while other sources providing data for Bangladesh suggest the country allocated a total of 1.3%. (World Bank 2017, Knoema 2016) Unlike India and Pakistan, Bangladesh does not possess any nuclear weapons and has not expressed any visions for acquiring them, however, they are working on developing first nuclear plants and are developing some aspects of nuclear technology. (IDN 2016)

INDICATOR	INDIA	BANGLADESH
POPULATION <sup>9</sup> (2015)	1,311,050,530	160,995,640
GDP <sup>10</sup>	7,998,278	537,659
MILITARY EXPENDITURE (% OF GDP IN 2017) <sup>11</sup>	2.4	1.3
TOTAL MILITARY EXPENDITURE IN USD (2017) <sup>12</sup>	51,000,000,000	1,590,000,000
NUCLEAR WEAPONS <sup>13</sup>	YES	NO

Figure 16 Summary table: India and Bangladesh socioeconomic indicators

<sup>9</sup> (World Bank 2016)

<sup>10</sup> (World Bank 2017)

<sup>11</sup> (World Bank 2017, Knoema 2016)

<sup>12</sup> (Global Fire Power 2017)

<sup>13</sup> (Arms Control Association 2017)

The power asymmetry makes us wonder what really lies behind the absence of open conflict: the treaty, or rather Bangladesh's relative weakness compared to India's economic and military might. Not only this, India, again, has the geographic advantage, but this time not only as the upper riparian on the Ganges and other 54 shared rivers (Thomas 2012), but also as Bangladesh's biggest neighbor engulfing it from the West, North and East. As such, India has all the prerequisites to keep its established regional hydro-hegemony.

Last but not least, there is an issue of erroneous news reporting and the effect this can have on civil domestic and international tensions. In September 2016, India and Bangladesh both experienced serious floods, and to reassure the people of India's Bihar and Uttar Pradesh that the government is doing its best, the local news reported the government opened all floodgates at Farakka Barrage. While this piece of information reassured the local people in India, it alarmed their counterparts in Bangladesh. (Dhaka Tribune 2016) What is important here is that while the information in the opened gates was correct, the media failed to mention that this was but a standard, agreed-upon practice, rather than a special, unilateral measure.

The power asymmetry, together with lack of political trust, is creating more tensions between the two sides, and with the rising water demands, these tensions are likely to increase in the field of water supply as well.

#### 4.4. POLICY RECOMMENDATIONS

**First and foremost, a new, up-to-date, basin-wide and inclusive treaty should replace the Ganges Water Sharing Treaty.** To this day, the GWST sets the regulations for

sharing of the surface waters at Farakka Barrage, however, this does not necessarily bring about sharing of the values and benefits that come from the river. By being limited exclusively to Farakka Barrage, the treaty does not address any potential project developments further upstream – and these could have substantial impact over water volume that reaches Farakka. A question arises of how can a treaty be fully functional and successful, if it does not take into account all of the actors involved. Despite the many emerging issues, no basin-wide approach has been actively discussed – an approach that would include the whole Ganges-Brahmaputra-Meghna region, thus regulating actions between Nepal, China, Bhutan, India and Bangladesh. China's ambitious hydro plans should be enough to encourage all downstream states to strive for meaningful dialogue with China. Incentives that would encourage India to pursue this path include issue-linkage, e.g. Bangladesh's environmental refugees in India could bring increased tensions in the neighboring Indian states. Bangladesh should continue appealing to the international bodies and perhaps reach out to China to bring about meaningful, basin-wide dialogue that India has been avoiding. Just like in the case of Pakistan, Bangladesh should demonstrate to India that a new treaty is in everyone's best interest.

**Continuing from the first paragraph, taking into account and sharing of relevant information would be crucial for success of any new, sustainable agreement.** The volumetric division of available water is still based on data that is now more than half a century old (1949-1988), a step that might have been reasonable when the treaty was signed, but should have been updated by now. Reliance on old, obsolete data does not factor in any of the recent (and not so recent) developments, such as climate change, population growth, pollution, increased upstream use, etc. This has resulted in both India and Bangladesh not receiving enough water, causing social tensions between and within

the two countries. As long as these factors are not included in the transboundary water management agreement, the conflict intensity cannot be expected to drop. According to some reports (Malhotra 2010, Hossain 2010), the Ganges River databases to this day lack accuracy and availability, therefore new data sharing should become more consistent and transparent, and then used for any future sustainable water sharing.

**A new treaty should provide clear harm prevention and mitigation regulations.** The GWST does not fully address neither drought, nor floods. While droughts are more common upstream, alternating floods and droughts are the two extremes that often affect Bangladesh. As a deltaic floodplain, it is naturally predisposed to flooding, while in the times of drought, the seawater from the south intrudes when the river is not strong enough to flush the sea downstream. This is a catastrophic recipe for agriculture; therefore, the treaty should more thoroughly address these issues. The first step for flood prevention would be improved data sharing and regulations for India's increased withdrawal in times of water surplus.

**When it comes to domestic and local solutions, both countries would benefit from shifting their agriculture from water intensive crops such as rice, towards crops that require less water for irrigation.** In Bangladesh, rice crops use up to 95% of all irrigation water (Ismail 2016), and the agriculture sector in general is the largest water consumer in the country. To meet the growing food and water needs, the government should encourage agricultural practices that use less water to produce more food. While some local governments in both India and Bangladesh have already started with campaigns for switch to less water-intensive crops such as pulses and millet (The Hindu 2017), both India and Bangladesh are still in world's top four rice producers (World Rice 2017),

Production 2017), therefore these campaigns have a long way to go. Numerous NGOs and international organizations (e.g. Water Aid, WWF, and Greenpeace) have relatively high budgets and are already working on water security related campaigns around the world. Their enhanced efforts to raise awareness within the local communities in South Asia could bring tangible results relatively quickly.

The current treaty and its provisions perpetuate the existing power imbalance between India and Bangladesh. This shows that an agreement does not necessarily bring about meaningful cooperation on sharing the water between affected communities. To avoid tensions and conflict over water, a new treaty should have a clear flood prevention and mitigation mechanism. This means that in times of water surplus, upstream riparian would be required to withdraw and store larger amounts of water, to help alleviate the water volume downstream.

**The river basins should be managed under a watchful eye of independent river commissions.** The Joint River Commission is limited by the national authorities and lacks the necessary independence to perform in regards to optimal solutions for water sharing. It now mostly acts as the examination body, but has no real power to bring about meaningful changes – for that it would need more autonomy.

**Last but not least, the governments on both sides should encourage transparent water sharing practices, and support the already existing policies with adequate human and financial resources.** Better data disclosure can lead to more compliance with regulations, both on local and international level.

## 5. CONCLUSION

### 5.1. SUMMARY

This thesis explored the transboundary water interactions between India and two of its neighbours, Pakistan and Bangladesh. It first overviewed the literature on the link between environmental challenges, more specifically water scarcity, and conflict. In the case study chapters, the author discussed India's water relations with Pakistan and Bangladesh, first briefly introducing the history behind the two cases, and then focusing on the two major treaties: Indus Water Treaty of 1960 and Ganges Water Sharing Treaty of 1996. The author aimed to re-evaluate the two treaties through Mirumachi's TWINS framework of coexisting conflict and cooperation, and discuss if the treaties have been successful in providing sustainable solution.

### 5.2. IMPLICATIONS

The author followed the consensus that wars over water have not become part of the security reality yet, however, the thesis also argued that water shortage issues could exacerbate existing conflicts. Through the TWINS matrix, the author demonstrated that despite the prevalent appraisal of the two treaties, certain levels of conflict still exist. And while water has so far not been the sole reason for these three states to go to war, there have been some open hostilities in the past and recent tensions, that have at least partially been multiplied by water shortage. Examples include India's pursuit of unilateral decisions to water security, domestic tensions within the states and even interstate environmental refugees and conflicts.

Furthermore, the power balance between the upper and lower riparian could help us understand why the situation has not been improved. In addition to the geographic



disadvantage of downstream riparians, both Pakistan and Bangladesh are far behind India's economic and military power. Of the two, Pakistan seems to have slightly more leverage due to its military power and regional allies, which could explain why Pakistan has been more proactive in trying to secure a better water-sharing agreement. At the same time, the emphasis here is on *trying*, since the existing IWT does not bring about a satisfactory solution. The water interactions between India and Pakistan do seem to be more conflictual than the case of India and Bangladesh, although it is not clear whether this is because of Pakistan's power to make river claims, or overall thorny relationship between the two sides. On the other hand, due to its relative position next to the powerful Indian neighbor, Bangladesh is only now starting to use the power of international arena to demand its water shares and challenge India's regional hydro hegemony.

In applying the concept of interactions to the transboundary water management and analyzing the relative power balance, the thesis offers an alternative approach to otherwise predominantly black-and-white analysis.

The common understanding that treaties prevent wars should not be confused with conflict resolution. Researching the two treaties' provisions, developments after Modi's election in 2014, and power asymmetry led to the conclusion that the treaties have failed to remove the water scarcity issue from political and even security agendas. The author believes that outdated data and provisions have contributed to this shortcoming, allowing India to strengthen its hydro-hegemonic position. This is shown in treating water as a bargaining chip (as in the case of Pakistan), and unilateral water withdrawals, that are still within the boundaries of the two treaties, but are known to harm the downstream riparians Pakistan and Bangladesh.

While the two treaties provided some minimal safeguards, they have not adapted to the changing nature of water supply and demand. An outdated treaty encourages the two parties to look for grey areas and exploit them, thus contributing to growing mistrust and potential tensions. Lack of transparency in data sharing and water negotiations can also give rise to erroneous media reports and political manipulations, adding on the already boiling civil unrest in times of drought or floods. The provisions should therefore be amended to include sustainable water management, impact prevention and mitigation, as well as clear conflict resolution mechanisms: e.g. specify what causing harm to the other party means and how can it be related to the harm-causing party's actions. The growing population is not only faced with a lesser supply, but also with pollution and privatization of the remaining water resources, which could be addressed at the level of international and domestic law, e.g. declaring access to safe water a constitutional right. While India has already done the first step in this direction by giving the Ganges strong legal protection, a holistic approach to the river conservation should be the ultimate goal. Polluted river water is linked to food and human security, which is not only domestic in nature, but – much like the rivers itself – transboundary. Perhaps clearer demonstrations of this issue linkage would encourage the governments to strengthen their efforts, and encourage them to adopt a basin-wide approach to solving this problem. Involving independent and powerful intermediates could make sure the potential new treaties would not perpetuate status quo, heavily influenced by power asymmetry. As well captured in the quotation below:

*“...a significant factor preventing war over water is that the actions of non-hegemonic states usually comply with the order preferred by the hegemon, whose*

*superior power position effectively discourages any violent resistance against the order.” (Zeitoun and Warner 2006, 437)*

Strong and independent multi-national institutions could help breach the existing discords, while making sure that all of the stakeholders are involved in shaping and then complying with the agreed-upon regulations. Both Nepal and China have their plans for hydro-developments and it would be unwise to treat those as a separate issue from downstream water usage. Most importantly, it would be beneficial to avoid bringing nationalistic ideas into water security domain. After all, water scarcity on either side of the border will inevitably impact the whole basin.

### 5.3. AREAS FOR FUTURE RESEARCH

With the lack of official statements and limited news and scholarly resources, the thesis could benefit from an extensive field study. Further research could dive deeper into the link between water scarcity and civil tensions, both domestic and international, thus contributing to the advocacy for immediate solving of the transboundary water sharing. The research would benefit from linking the fields of ecology, security studies, international affairs and human rights.

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