

A STUDY OF THE LEGAL FRAMEWORK FOR THE CONTROL AND REGULATION OF INTER COUNTRY WATER SHARING SINCE 1973 WITH SPECIAL REFERENCE TO INDO - BANGLADESH WATER SHARING

INTRODUCTION

EVOLUTION OF THE PROBLEM

Water conflicts arise at various levels, between countries, states, regions, and sub-regions within states, districts, political parties, castes and groups, and individual farmers. These pose a significant threat to the economic growth, social stability, security, and ecosystem health. Conflicts indicate the absence of proper democratic, legal, and administrative mechanisms to handle issues that give rise to such disputes. Water is a complex resource and is turned into a resource through ideological and material means, by isolating and imposing an economic and private property framework on a complex part of the ecosystem.

While blessed with an abundance of water resources, much of the management problems of the Indian subcontinent come about from the dramatic seasonal variations in rainfall. This management problem is compounded with the creation of new national borders throughout the region because of the unprecedented rain that tends to alter the boundaries with their flow. This problem arises when an upper riparian country like India refuses to release or releases very less quantity of water to a lower riparian country like Bangladesh. The India-Bangladesh Ganges Treaty In 1951, India announced its intention to build the Farakka Barrage at the head of the Ganges River Delta in West Bengal, 11 miles (17.6

km) upstream of the border with then East Pakistan (now Bangladesh). The construction began in 1961 and the Barrage became operational in 1975. The Barrage, which diverts water into a canal for irrigation and then into a channel of the Hugli River (which flows into Kolkata), became a source of tension between India and Pakistan, and later Bangladesh, who claimed that it prevented water from flowing into its territory, causing serious damage to the water table, and reducing irrigation and domestic supplies. Concomitant to this controversy, India and Bangladesh signed in 1972 the “Statute of the Indo- Bangladesh Joint Rivers Commission” with the view to working together “in harnessing the rivers common to both countries for the benefit of the peoples of the two countries”. However, the Statute, due to its general nature, failed to include any provision obligating India to adapt or change the operation of the Farakka Barrage, which left Bangladesh to continue with its complaints.¹

In 1976, Bangladesh took its case to the United Nations, and sponsored a resolution calling on India to share more water and consider the interests of Bangladesh in the operation of the Farakka Barrage. The resolution failed to pass, but a Statement of Consensus was adopted by the UN General Assembly calling on the parties to resolve the issue peacefully. As a result, in 1977, India and Bangladesh signed an Agreement for a five-year period during which they agreed to seek a long-term solution to the allocation of water of the Ganges River.

The 1977 Agreement expired in 1982, and in that year, India and Bangladesh signed a Memorandum of Understanding, which acknowledged that this Agreement “had not proved suitable for finding a satisfactory and durable solution” to the problems of the Farakka Barrage. To address the river management issues on an interim basis, both nations agreed to a temporary allocation of water for the 1983–1984 dry seasons. This Memorandum also expired, and India continued to operate Farakka Barrage in 1985, without a binding legal document in place. A second Memorandum of Understanding addressed dam operations between 1986 and 1988, but that also expired. The period

¹Aaron T. Wolf and Joshua T. Newton, “Case Study of Transboundary Dispute Resolution: the Ganges River controversy”, 1-3.

between 1989 and 1996 passed without a formal legal instrument. Finally, in 1996, India and Bangladesh signed a treaty on sharing the Ganges River at Farakka.

The 1996 Ganges Treaty, which expires in 2026, establishes a formula for sharing water. Moreover, the Treaty also calls on both governments to attempt to reach water-sharing agreements on another 53 “common rivers”. That the Treaty calls for future cooperation over the common rivers shared by Bangladesh and India, from a political angle, is significant.²

After a number of short-term legal instruments, India and Bangladesh have been able to resolve their long and bitter dispute over the Ganges through a 30-year Treaty. However, almost half of the 30 years during which the Treaty is to remain in force have elapsed. Yet, no agreement has been reached between the two parties on how to augment the flow of the Ganges during the dry season and provide sufficient amounts of water for both parties, which is the crux of the dispute on the Ganges River. It should also be added that no agreement on any of the other 53 shared rivers has thus far been concluded. Incorporation of a clear mechanism for dispute resolution is a precondition for effective long-term basin management. In many river basins, lack of such a mechanism has made treaties ineffective.

In the case of the Ganges, the basin governance is between Nepal and India on the upstream part and between Bangladesh and India on the downstream part. There is no one single commission for the entire river basin. The Ganges Treaty establishes a Joint Committee and defines its jurisdiction for monitoring implementation of the Treaty and exchanging data and information. The Joint Committee, consisting of an equal number of representatives nominated by the Parties, is entrusted to observe and record the daily flows below the Farakka Barrage as well as at Hardinge Bridge.

Guided by the principles of equity, fairness and no harm to either Party, both agree to conclude water sharing treaties/agreements with regard to 53 other common rivers. The

² MMQ Mirza, “The Ganges Water-Sharing Treaty: Risk Analysis of the Negotiated Discharge”, *IJW*, 57–74, 2(1).

Treaty discourages unilateral development, and calls for conclusion of water-sharing agreements on the basis of the principles of equity, fairness and no harm, in turn, acknowledging the necessity of coordinated management of the watercourses. The Treaty further states that its sharing arrangements will be reviewed at five years interval or earlier, as required by either Party, and needed adjustments thereto. The Ganges Treaty does not include a clear and specific dispute resolution and arbitration provision. The preamble of the Treaty mentions that both Parties wish to find a fair and just solution without affecting the rights and entitlements of either country. Article VII states that if the Joint Committee fails to resolve a dispute arising out of the implementation of the Treaty, it should be referred to the Indo-Bangladesh Joint River Commission, an entity established in 1972.

The Commission, which has met annually, to discuss problems and undertake joint investigations on the lower part of the Ganges River, does not, however, have the power to allocate water. The Treaty, however, fails to specify the level of government involved and the timeframe for the settlement of the dispute, nor does it bind the Parties to seek resolution of the dispute. The Treaty, it appears, chose political means, not legal; to resolve any dispute arising from its implementation the absence of arbitration mechanisms makes this legal Instrument less effective.³

STATEMENT OF PROBLEM

Equitable distribution of water and division of water bodies is an issue to be resolved with comity and co-operation of nations. It is not possible for a single nation to establish a viable regime which reflects all water related problems including quality, quantity, distribution and the environment. The needs of States change with population, location and economic growth and allocation agreements are quickly becoming outdated and even restrictive to development. This approach to inter-country water runs contrary to the whole idea of water being a shared resource. Allocation agreements lack the commitment

³Upreti Kishore and Salman M. A. Salman, "Legal Aspects of Sharing and Management of Transboundary Waters in South Asia: Preventing Conflicts and Promoting Cooperation", HSJ, 641-661, 56:4

to a shared set of priorities, principles and goals and lacks mechanisms to deal with changes in resource availability and flexibility. Treaty implementations that provide opportunities to defuse the potential conflicts between countries have a very weak framework. The conflicts relating to water sharing remain unresolved due to lack of norms in water sharing agreements to manage, control and regulate water flows.

HYPOTHESIS

Many countries in the world and especially south Asian countries share the same river resource. Difficulty arises on the issue of water sharing especially when the upstream country blocks the water in reservoirs leaving the downstream country dry or flooded. International agreements and instrumentations on water laws lack mechanisms to deal with disputes relating to the resource availability and proper utilisation of such resources. Flexibility in the implementation of such treaties that provide opportunities to diffuse the actual and potential conflicts between states on allocation of water resources is not there. The legal framework relating to the Indo- Bangladesh water sharing too suffers from this short coming of water allocation. A convention addressing the holistic issues of water resource sharing is the need of the hour.

RESEARCH QUESTIONS

1. What were the terms and conditions of water sharing between India and Bangladesh initially?
2. What are norms of trans-boundary water sharing?
3. Whether allocation of the uses and benefits of a watercourse has been done in an equitable manner?
4. Whether the various institutional arrangements and mechanisms as reflected in treaties and agreements have lived up to their expectations?
5. Whether Indian water-dispute settlement mechanisms are transparent and just?

RESEARCH METHODOLOGY

The present study will be a *doctrinal method of research*, where an extensive literature review will be done, which will include text-books, articles appearing in different journals, statutory laws and international instruments.

Doctrinal method shall be employed because abundant literature is available on the issue including, primary sources such as Helsinki Rules, International Conventions and secondary sources available in the form of scholarly articles, books, journals, and data collected by international organizations. However, the aspect of legal solution to the transboundary water sharing between India and Bangladesh is not dealt with in any of the research conducted.

OBJECTIVE OF THE STUDY

The objective of the study is to understand the difficulties in trans-boundary water sharing and an attempt to evolve a successful dispute resolution mechanism that is just, equitable and transparent. The researcher also wishes to explore whether comity and co-operation of nation is a ground reality in the water sector of the world.

SIGNIFICANCE OF THE RESEARCH

The research is significant in that it will record and consolidate the world endeavour and evolving transparent, just and equitable water jurisprudence over the past 40 years. It is also significant in that after the formation of Bangladesh there has been repeated impasse in water sharing negotiations between India and Bangladesh. This research will look into the various issues and impediments between the two countries with regard to sharing of water.

SCHEME OF THE STUDY

INTRODUCTION

The chapter deals with a brief insight into the topic of research. It will introduce the reader to the main topic of research. There is a situation in international law as well as in Indian context where the States are finding difficult to come to a solution regarding sharing their water resources. This chapter also deals with the reasoning for undertaking the present research and the objective and significance of the present research work.

CHAPTER I: THEORETICAL AND CONCEPTUAL FRAMEWORK

This part of the thesis will deal with an overview of importance of water and the evolution of water law. It intends to focus on the concept of transboundary water sharing among countries and the impact and influence it has on other riparian states. International water law principles will be looked into to further explain and support the research.

CHAPTER II: PRINCIPLES OF INTERNATIONAL LAW AND SETTLEMENT OF WATER DISPUTES

This Chapter deals with the position and principles of water and water sharing between countries and tries to delve into the international norms available regarding the water allocation and sharing. Convention on the Law of the Non-navigational Uses of International Watercourses 1997 is first of its own kind of Convention to focus on protection, preservation and management of water courses. Similarly this chapter also focuses on different other Conventions introduced in due course of time for the purpose of bringing in some parity for understanding the rights and obligations of States when it comes to water sharing.

The different theories developed over time for equitable and reasonable utilization and participation of States are: the theory of limited territorial sovereignty; the principle of equitable and reasonable utilization; an obligation not to cause significant harm; the principles of cooperation, information exchange, notification and consultation; and the peaceful settlement of disputes. These principles form the basis of the 1966 Helsinki Rules on the Uses of the Waters of International Rivers (hereinafter Helsinki Rules) and the 1997 UN Convention on Non Navigational Uses of International Watercourses.

This Chapter then individually focuses on each of the principles mentioned above and the factors responsible for water conflict which marks a very important presence in understanding the reasons for such conflicts ranging from sovereignty, economics to water scarcity. This chapter also focuses upon the water conflicts between India and Bangladesh especially the Ganga Treaty on sharing of Gange's waters and draws a comparative analysis between Ganga Treaty and International Watercourse Law, taking into consideration different Conventions available for water sharing.

After dwelling upon international instruments and India- Bangladesh context, the Chapter comes to a conclusion that transboundary water sharing resources crisis could be avoided by a balanced legal framework, a treaty that balances the demand of both the state and adhere to the principle of equitable and reasonable utilization.

CHAPTER III: LEGAL FRAMEWORK ON WATER SHARING IN INDIA: AN INTER-STATE AND TRANSBOUNDARY APPROACH

This chapter purports to look into constitutional provisions dealing with water use and water sharing such as Art. 262 of the Indian Constitution, Schedule 7, List 2, Entries 17 and 21, List I, Entries 24, 25, 57 Further, a study as to the reasons for adopting a water law in India is also looked into. A reference would be made to the prior existing water laws such as Indian Canal and Drainage Act, 1873, Inter-State Water Disputes Act, 1956 and River Boards Act, 1956 .Besides statutory Indian Framework, common law

principles as deduced in landmark judgments, such as *Subhash Kumar v. State of Bihar*, by the Hon. Supreme Court. Next, the water sharing agreements between India and Bangladesh, Pakistan is also looked into in detail.

This chapter attempts at studying the Indian legal framework that governs transboundary water sharing between India and its neighbours and the inter-state regime. Further, the chapter attempts to answer the research question as to whether the existing legal framework is sufficient in dealing with such transboundary conflicts.

Though sharing of water resources across political boundaries is a matter of concern, India in this context, experiences a major challenge, as it faces both trans-national and intra- state conflicts on common and pooled rivers. Almost all states in India face inter-state water disputes, and international water disputes with Pakistan, Nepal and China to name a few. The Indian experience of water conflicts differs in regard of water sharing from the global one , due to the sole reason , that India , being a country not only shares water resources with other countries, but water sharing occurs between the domestic states at large. Being a federal country, the different federal units of a state through which the river flows may have strong differences and contentions with respect to water sharing, as each state may want a fairly large allocation of the river water on its side. Further, most water disputes among countries and states occur predominantly due to the sole reason and lucidity that rivers do not follow any specific political limits which poses a problem among nations. Second, the uneven distribution of water resources affects the hydrological cycle and water availability, thereby directly affecting water quality. Third, the regionalization of national polity is another cause for the Indian experience of water conflicts among states. Therefore, it became pertinent to resolve such water conflicts through constitutional and legislative means. The existing water law regime in India is largely a product of principles, rules and policies that were adopted over many decades and for substantiating the current position, reference is also made to the laws dealing with water sharing in Australia and the US.

CHAPTER IV: INDO- BANGLADESH WATER SHARING: AN OVERVIEW OF TERMS AND CONDITIONS

This Chapter attempts to look into the problems in execution of water sharing agreements between India and its neighbours, with specific reference to the Indo-Bangladesh Treaty, such as lack of finite resources and unwillingness and lack of co-operation between the governments and reasons for non-implementation. Further, an analysis would be made into the lacunae and flaws in such the Teesta deal and the Ganges Treaty.

This chapter also attempts at considering the ambit of transboundary water sharing with definite reference to the India- Bangladesh water treaty. Further, the chapter attempts at reviewing the said Treaty in light of its terms and conditions and its implementation and moreover, answer the research question as to whether the said institutional mechanism has lived upto its expectations.

In order to establish a viable solution, the origins of the water dispute between India and Bangladesh is researched upon minutely and the negotiations that took place is also researched upon. What is pertinent to note in this chapter, is the application of international law principles of water law and customary norms to the said treaties signed between India and Bangladesh. It is worthwhile to mention that the 1996 water treaty seeks to incorporate a reasonable and fair solution and formula for water allocation and utilization by India and Bangladesh which is in consonance with the Human Rights and the UN Watercourses Convention which advocate for the principle of ‘no-harm rule’.

Further the Ganges Water treaty which forms the basis of the agreement between India and Bangladesh is analyzed and the fallouts of the said Treaty are also researched upon in this chapter.

CHAPTER V: ISSUES IN THE IMPLEMENTATION OF WATER SHARING TREATIES BETWEEN INDIA AND BANGLADESH

The main purpose of this chapter is to highlight the issues between the implementation of water sharing treaties between India and Bangladesh. Water rights in India are closely linked to property right in land. And the implication of the same is one of the reasons for over exploitation. There is a dramatic fall of water in some of the Indian agriculture states, resulting in poor agriculture conditions and reduction in the production. This chapter deals with the established legislations crated to resolve the dispute between India and Bangladesh over Ganges water sharing and Teesta water sharing and how the implementation of these legislations is still in question and why there is delay in resolving the dispute over water sharing.

This chapter also deals in brief to highlight the problems and inadequacies in the Treaty's implementation in a simple and easy to understand manner such that steps may be taken to try to rectify some of these issues on the ground.

CHAPTER VI: CONCLUSION AND SUGGESTIONS

The final chapter aims to provide a comprehensive conclusion to the present statement of problem after compiling all the above information. Solutions and mechanisms would be proposed that can work towards the enhancement of the water sharing process and provide a model so as to remedy the defects in the enacted transboundary water sharing agreements and their implementation issues in regard to the Indo- Bangladesh water treaty.

LITERATURE REVIEW

With the growing population and rapidly expanding water demand for development an upstream country would clearly benefit from continuing to divert more water in trans-boundary water sharing of a river. In Bangladesh, the final downstream country along the Ganges, fresh water availability depends on the share of water diverted by the upstream country, India. For decades, India and Bangladesh failed to resolve the water sharing issues; even it signed the major new agreement on water sharing (Ganges Water Treaty 1996) to resolve the dispute. Under International law many principles of transboundary water resources management have been evolved and are embodied in the form of different Rules and Conventions. The inclusion of these internationally accepted transboundary water resources management principles in the bilateral treaties which could serve as guiding principles for water based collaborative development endeavours in the region failed to resolve the conflict over sharing of common rivers between India and Bangladesh.

There are many books, articles, journals concerning the inter country water sharing particularly water sharing between India and Bangladesh, but still available materials are inadequate to give clear insight about the problem of proper and effective implementation of water sharing agreements between these countries. While pursuing on the present research topic a sharp dearth of existing text materials have been noticed.

As far as the present research on the area of water sharing between India and Bangladesh is concerned the text books available under International Law as well as books exclusively covering water sharing between these countries have been thoroughly reviewed. Besides these, articles as appearing in different journals, statutory laws, international conventions relevant to the research topic have also been reviewed for the purpose of getting acquainted with the studies already done in respect of the research problem.

BOOKS

For the purpose of the research the following books have been reviewed:

1. Wirsing R and Jasparro C, **“River Rivalry: Water Disputes, Resource Insecurity, and Diplomatic Deadlock in South Asia”**, Water Policy, (2007).

This book is the result of collaboration between the Robert M. La Follette School of Public Affairs at the University of Wisconsin Madison and the U.S. Central Intelligence Agency Office of South Asia Analysis. This study has provided graduate students at La Follette the opportunity to improve their research and policy analysis skills while producing a report that contributes to knowledge about South Asia. The authors of book are all in their last semester of their degree program and are enrolled in Public Affairs, Workshop in International Public Affairs. Although acquiring a set of analytic skills is important, there is no substitute for doing policy analysis as a means of learning policy analysis.

The authors of this book explore potential conflicts that could arise between India and neighbouring Pakistan, Bangladesh and Nepal over the growing shortage of water. Their detailed analysis highlights international disputes over water that could arise, and they suggest policies that may help minimize these disagreements. Increasing demand plus decreasing supply and access is likely to exacerbate disputes over regional water resources. Thus far, conflicts between India and other nations have been mediated through a combination of treaties and international arbitration. As a number of rivers flow across national boundaries, these agreements govern water allocation between India and its neighbours and develop a protocol for hydrological construction projects. However, if present demographic, economic and environmental trends continue, increased tensions between India and its neighbours may lead to conflicts that could threaten regional stability.

The authors argue that despite a history of cooperation, the likelihood of conflict between India and Pakistan and Bangladesh over shared river resources is expected to increase. Disputes over water will likely undermine prospects for a more stable and sustainable peace between the two countries. Nepal and Bangladesh remain weak politically and militarily in relation to India, and they generally possess little leverage in negotiating water issues. Of greater concern are the substantial public health consequences of these disputes. Flooding, soil salinization and destruction of arable land in the northern Indian states of Bihar and Uttar Pradesh and in Bangladesh have displaced people and disrupted economic, social and political life. Such issues raise the potential for increased local-level, interprovincial and border-area conflict. In addition, these disruptions threaten the quality of economic, social and political relationships between India and Nepal, and between India and Bangladesh.

This book begins by summarizing current conflicts between India and its neighbours Pakistan, Bangladesh and Nepal. Next, it employs available data and statistical projections to examine anticipated trends in supply and demand for water. By integrating political, economic and climactic trends, the report highlights areas of concern and outlines probable developments. Finally, the report assesses several policy measures that South Asian countries might employ to mitigate water shortages and the conflicts likely to accompany them. External assistance may play an important role in these efforts. Disputes include disagreements over the Farraka Barrage, the Teesta River project and the River Linking Project to connect the Ganges and Brahmaputra rivers in the east to the Kaberi and Mahanada rivers in the south. The Joint Committee of Experts is staffed by the secretaries of water resources for each country and is charged by Article IX of the 1996 Ganges Treaty with negotiating agreements on common rivers between India and Bangladesh. Since its inception, the committee has met seven times and made little progress in resolving these disputes. However, the committee could provide a framework for resolving other conflicts about water in the region.

The author also highlights on The Helsinki/Berlin rules and the UN convention which all address the equitable and reasonable distribution of international waters and include provisions mandating that countries sharing rivers have an obligation not to cause significant harm and a general obligation to cooperate.

The book is divided into four main components. Section 1 summarizes the history and status of major water disputes between India and three of its neighbours, Pakistan, Bangladesh and Nepal. Section 2 forecasts trends in water accumulation of salts in soil and fresh water demand by analyzing expected growth patterns in domestic, agricultural and industrial use. It also examines the probable effects of climate change on the projected water supply in each major South Asian river system. Section 3 extrapolates from current trends to forecast the likelihood, location and magnitude of conflicts about water in South Asia. Finally, Section 4 presents an opportunity analysis, in which strategies to mitigate potential conflict are discussed.

As the book shows, water issues likely will continue to be a major source of conflict between India and neighbouring Pakistan, Bangladesh and Nepal in coming decades. Mechanisms such as the Indus Water Treaty can provide a basis for resolving these disputes, but new circumstances, including growing demand and the retreat of glaciers, will lead to new a challenge which has not been dealt in this book. And how South Asian countries respond to these challenges will be key in determining the long-term sustainability of regional water supplies and the author is silent in this point. No mention is made about the control and regulation of water sharing treaties regarding their effective implementation between countries particularly Indo- Bangladesh.

2. Brahma Chellaney, “**Water: Asia’s New Battleground**”, Washington, D.C.: Georgetown University Press, 2011.

The so-called ‘rise of Asia’ in the past two decades is complex and multi-faceted, but most analyses focus on the galloping rate of economic growth or the fast-paced militarization of China and India. Brahma Chellaney, the author takes a different approach in his book, *Water: Asia’s New Battleground*, by analyzing the fissures between Asian states over shared water resources, particularly rivers. Chellaney argues that water disputes threaten not only the collective rise of Asia as a responsible world power, but also foreshadow a type of conflict other regions will experience with increasing frequency and intensity. Chellaney’s objective is to provide a systematic analysis of water and peace that spans the entire continent of Asia. The book brings together compelling data on topics as diverse as the links between food, water, and the global economy, the cultural history of Tibet, and the importance of biological diversity.

Indian and Chinese differences in international engagement over transboundary waters are explicated through their history with water treaties. While India has entered into water treaties with Pakistan, Nepal and Bangladesh, China has not signed a water treaty with any state, and has active water disputes with at least nine of its neighbours. Chellaney’s interpretation of customary international watercourse law is that the upper-riparian has first right to exploit water resources when unencumbered by binding treaties. According to this interpretation, as long as China avoids entering into water treaties, it can exploit its position as an upper-riparian with the full support of customary international law. While he portrays the democratic and liberal style of Indian water development favourably as it contrasts with the Chinese autocratic model, he ruefully notes the disadvantages of the Indian approach. In doing so, he seems to express a wistful hope that India’s water situation would improve if its management scheme were only more like China’s.

There is no doubt that Brahma Chellaney’s book contains a wealth of carefully referenced data about water conflicts throughout Asia. But the theoretical and analytical tools he employs to analyze this mass of information are less than satisfying. Portions of

his book deal with the Middle East, Korea, and Central Asia, and touch on interesting topics like the intersection of territorial disputes, transboundary conflicts, and minority populations. But it is not clear how these sections fit with the main thrust of the book--the geopolitical implications for India of water development on the Tibetan Plateau resource scarcity. The chapters dealing with the hydrological significance of Tibet and Chinese water development plans are very informative and well-researched. Chellaney's *Water: Asia's Next Battleground* will be useful primarily for a descriptive overview of the major Asian water disputes, and to gain insight into how a prominent figure of the Indian security establishment understands the water development activities.

3. Ashok Swain, "**The Environmental Trap: The Ganges River Diversion, Bangladeshi Migration and Conflicts in India**", Uppsala University Department of Peace & Conflict Research, Report No. 41, 1996.

Environmental destruction, besides being the immediate factor in fuelling competition over natural resources, can also potentially lead to loss of source of living, which may result in the population migration. In this book, the author makes an attempt to develop a conceptual framework of conceivable social conflicts that are more likely to develop in an environmental migration induced scarcity situation. In order to test some of the ideas of the framework, a case study was conducted in South Asia. Emphasis has been made on the environmentally displaced Muslims in Bangladesh who are migrating to Hindu dominated India from the late 1970s and it has culminated in a number of native-migrant conflicts in the receiving society. According to the findings of his case study, he asserts that the possibility of environmental migration from the environmentally destroyed region may trap the powerful state in a troublesome situation.

In his book he makes the possible linkages between environmental destruction and social conflict which has come to the forefront. In his study, Dr Ashok Swain of the Department of Peace and Conflict Research makes an important and novel contribution to this development. He does so by introducing useful concepts from conflict theory and applying them to a particular case where linkages might be found between human made

environmental change, and social conflict. The study concerns the use of the Ganges River by the two neighbouring countries sharing this river, India and Bangladesh. Dr Swain is able to bring new light on an issue, which has been a source of contention between the countries. By analyzing the internal implications, first in Bangladesh and then in India, of India's construction of a barrage across the Ganges, he shows that the fate of these two countries is closely intertwined.

A further effect, Dr Swain demonstrates with entirely new material, the migratory movement away from the area and, surprisingly but logically, into India. This then appears to be an important factor in intensifying tensions inside the country which intervened into the environment in the first place: India. Thus, Dr Swain recounts a story with implications for an understanding of the impact of human-made changes on nature, on the social cohesion of the affected societies and on conditions for peaceful international relations. His particular project is designed to explore the spill-over effects of trans-border environmental destruction. It is done by examining various forms of environmental destruction on the south-western part of Bangladesh due to India's diversion of Ganges River water at Farakka Barrage and their contribution to the native-migrant conflicts in different parts of India between Bangladeshi migrants and the Indian citizens. Field investigation and interviews in different parts of these two countries have been carried out for this study in three phases from 1993 to 1995.

In order to test some of the ideas of the framework, a case study is conducted in South Asia. Conforming to the discussion in the Chapter 1, the Ganges River case study establishes a linkage between population growth, scarcity of the natural resource and the conflict among users. Due to multiplying pressure on the water resource from their growing population, both the countries are trying to obtain more shares from other party, while protecting what they already have, and that blocks the implementation of the augmentation proposals. In Chapter 2, he discusses the bilateral dispute between India and Bangladesh over the sharing of the Ganges River water. India's water diversion at Farakka barrage has caused a bitter disagreement for the last twenty years at the bilateral level. But, why Bangladesh is complaining the operation of the Farakka barrage? To this

question the author lacks in his study, which is the main basis of present research work. In this Chapter 3, he assesses the adverse environmental consequences of Farakka diversion over the Ganges dependent region of Bangladesh. While assessing the adverse environmental effects of Farakka withdrawal, his study has taken note of the existing research works available on this subject. In this chapter he also gives an account of environmental hardship of the people of south-western Bangladesh due to India's water diversion from the Ganges River at Farakka. But, how these affected people are adapting to the changing situation for their own survival? There lies no answer to this question, however in Chapter 4; he tries to address this question but lot more research is to be done to this topic.

The author is able to interview six Bangladeshi migrants in and around the Shillong city, the capital of Meghalaya in December 1993. All of them had left their homes in Bangladesh after 1975 and four of them traced their origin to the south-western part of Bangladesh. All four, who had come from the south-western region were Muslims and their reasons of migrating with their family members was attributed to environmental reasons: one mentioned reduced fish catch, one river-bank erosion and the other two talked about repeated heavy flooding.

Many of the typical issues which result in neighbourhood disputes between India and Bangladesh are nearly non-existent. Only the issues which stand them apart over the sharing of the Ganges River water and the Muslim migration from Bangladesh to India, the author discusses in his book. No answer has been given as to whether the water dispute over the Farakka withdrawal is the typical resource scarcity conflict between the two countries contesting scarce water resource.

4. Ashok Swain, "**Conflicts over Water: The Ganges Water Dispute**", Sage Publications, 1993.

The author Ashok Swain is Research Fellow in the Department of Peace and Conflict Research, Uppsala University, Uppsala, Sweden. The constitutional conversion of Bangladesh from secularism to Islamic ideals in the 1980's has provided grounds for some Indian political organisations to portray the Ganges conflict as a struggle between Hindus and Muslims. In his book Ashok Swain refers that the religious importance of the Ganges River for the Hindus has further aggravated the issue. The author mentions about the environmental destruction in Bangladesh after the Farakka Barrage was put into operation. The decreased lean season flow has also adversely affected the hydrological and morphological behaviour of the Ganges and its tributaries, causing excessive riverbed siltation with consequent reduction in conveyance capacity, which has led to frequent changes of the river regime and devastating floods during the monsoons. At the same time, he writes that on the Bangladeshi side, the power struggle among various groups has not allowed the regime any compromise which might be termed by the opposition as a 'sell out' to India. Moreover, increasingly devastating character of the floods has ravaged the country's dwindling economy, making Bangladesh virtually an "international basket case".

At the end, he talks about the need for a third agency to act as a mediator, who might change the nature of both of the parties positions, and help in solving international river disputes. He focuses on India's reluctance to accept any third party mediation for solution of river disputes. Thus he says that the SAARC could be a platform for dealing with issues common to the South Asian Region, so that the overall development of the Ganges- Brahmaputra river system, which carries the largest volume of water in the world except for the Amazon, can promise a better future for hundreds of millions in one of the poorest regions on earth. However, regarding permanent solution to the water sharing dispute between India and Bangladesh, implementation of the treaties signed between them, which is the main thrust of the research, the author is silent about it.

5. Ashok Swain, **“Water Scarcity: A Threat to Global Security, Environment & Security”**, Sage Publications, 2002

This book is one of the products of an on-going project in the Department of Peace and Conflict Research, Uppsala University, Sweden, on the theme of “Environmental and Conflict”. The author in his book tries to highlight that water scarcity has become a threat to global security. Between 1940 and 1980, global water use has doubled and is expected to double again by the turn of the century, and as the population increases and the amount of available water resources remains constant, the maximum per capita demand that a country can support decreases correspondingly. Water quality has also become a major environmental issues in many of the industrialised countries.

In the first chapter, he perceives how water has become a source of conflict. He suggests, population growth accompanied by rapid industrialisation, massive urbanisation, and intensifying agricultural activities will increase the demand for water resources as well as pollute the supply, which will result in an acute shortage, then the social actors will work purposefully and consciously for their own interests. This increasing competition can potentially destroy the existing social arrangements regarding water distribution in society and the incompatibilities between existing actors will weaken the administrative structure. In the second chapter, he highlights about the conflicts among the states, and the origin of many conflicts in history which can be found in the states desire to acquire territory and natural resources. When one state works for ‘development’ by acquiring or exploiting more than its perceived share of the water resource, it affects the interests of other user states. Subsequent actions by the affected states to protect their interests eventually result in conflict.

He cites and discusses a list of international major water conflicts arising out of the rivers shared between two riparian countries. In the third chapter, the author highlights that the construction of large scale dams for the efficient use of water resources has created tension between the state and a group of its own citizens in the past few years. A weak structure weakened by strong ethnic identities, inefficient administration, and a lack of

water resources predisposes the developing countries to this development. In the entire book, the author stresses, that most of the countries are weak states and lack the resources and administrative abilities to deal with problems arising from water scarcity. Lack of education and blind ethnic loyalties also easily lead to politicisation of the water problem as well as ethnicisation of the issue. The book does not particularly deal with the water sharing issues between indo- Bangladesh. However, this book will certainly help me to understand the basis and origin of water conflicts and how these conflicts have arisen with the increasing incompatibilities among competing parties over the sharing or use of a scarce water supply.

Apart from text-books, various articles, published in different journals have been reviewed for the purpose of finding out the works, research and studies already done and also for understanding the present position regarding the research work proposed to be done. The articles and papers surveyed are as follows:

ARTICLES

1. Anik Bhaduri & Edward B Barbier, “**International Water Transfer and Sharing: The Case of the Ganges River**”, Environment and Development Economics, vol. 13, no. 01, 2008.

In the following paper the author is concerned with water sharing of the Ganges River between India and Bangladesh, with possible augmentation through water transfers from Nepal. He has analyzed the case when water from Nepal can be transferred to Bangladesh through the upstream country, India as the local geography only permits such water transfer. A game theoretic model has been formulated by him to determine the optimal share of water diverted to Bangladesh by India, and the optimal amount of water transfer from Nepal. He discusses that in absence of altruism, India would allow less water flow to Bangladesh than in the case when there is no provision to buy water from Nepal. He has also explored that positive externalities could induce India to buy water jointly with Bangladesh, and such a case will only occur if the countries possess altruistic concerns

and share water according to an agreement. The paper demonstrates how issue linkage can facilitate agreement on a number of international river basin issues, and strengthen the enforceability of existing agreements. The following paper makes two contributions. Firstly the author develops a model of market based transfer in an international river basin to illustrate how such a water transfer can influence the water-sharing decisions of two countries in the basin. To the best of his knowledge, this contribution of the paper represents the first analysis to explore the potential of market based water transfers as a means of facilitating International River basin management and the resolution of water conflict. The second contribution of the paper illustrates the example of water sharing of the Ganges River between India and Bangladesh, with possible augmentation of the entire Ganges River flow through transfers from water stored in Nepal. The paper also makes a contribution to analyzing an important policy proposal concerning transboundary water sharing in the Ganges River Basin. To understand the importance of this water transfer. He formulates a water-sharing model is to determine the optimal amount of water transfer. Thus the paper illustrates the example of water transfer in an international river basin by focusing on Bangladesh's proposal to transfer water from Nepal as a case study.

2. Kishor Uprety & Salman M. A. Salman, “**Legal aspects of sharing and management of transboundary waters in South Asia: preventing conflicts and promoting cooperation**”, *Hydrological Sciences Journal*, 56:4, pp-641-661, 2001.

In this article the author presents that the development of cooperation among Bangladesh, India, Nepal and Pakistan with respect to the Indus and the Ganges-Brahmaputra-Meghna river basins, South Asia's major transboundary rivers, has been a cause of tension, apprehension and ongoing disputes. The paper draws attention to the hydro-politics on transference and allocation, along with the diverging positions and unique concerns of the riparian's on bilateral, multilateral, national as well as regional fronts. While examining the official water discourses and the evolution of different international legal instruments applicable to the governance of water relations among the riparian's, the paper also sketches the emerging concerns in their relationships, as well as their efforts to cooperate

and collaborate to avert disputes and manage water sharing and governance. The author has conducted a research on conflicts over transboundary waters and suggests that a change in resource environments, which outpaces the capacity of existing institutions to deal with that change, is one major cause of tension.

He cites ample examples from history in which the absence of mechanisms to deal with change has led to conflicts between countries. The 1944 Treaty between the USA and Mexico over three shared rivers (Colorado, Tijuana and the Lower Rio Grande) is one such example. Similarly, he addresses that how low water levels on the Ganges in 1997, combined with historically-engraved mutual suspicion between the parties, threatened the continuation of the Ganges Treaty signed just one year earlier and While both treaties were legally binding on the parties involved, controversies about their implementation led to a general atmosphere of mistrust. He further suggests that most conflicts related to water sharing remain unresolved due to lack of norms, in shared-water agreements, to manage water flows. Finally, he has presented a model for the choice of governance mechanisms to address variability, discussing the likely advantages and disadvantages of each, and providing insights to elements that can also be beneficial to others.

3. B. M. Abbas A.T, “**Sharing The Waters of the Ganges**”, International Journal of Water Resources Development, 1:1, pp- 51-64. 1983.

B. M. Abbas A.T. is an irrigation engineer by profession and an internationally recognized authority on rivers and water resources development. He has been adviser to successive Presidents of Bangladesh and is a Former Minister for Water Resources in his country's government. He is a member of the Committee on International Water Resources Law of the International Law Association (ILA). In his article he gives an overview of protracted negotiation over the use of the waters of the River Ganges by Bangladesh and India, agreement was for five years on sharing the waters of the river and seeking a long-term solution to the problem within three years. But the two countries have not been able to agree on the long-term scheme. In his article the course of the talks

and the salient features of the agreement are briefly outlined. The author has been associated with the negotiations for about three decades and, as Adviser to the President of Bangladesh, he headed the official Bangladesh Delegation which concluded the 1977 agreement with India. The article concludes with a strong plea for a basin-wide approach to the problem and joint efforts by the co-basin states to develop the water resources of the Ganges and the Brahmaputra Rivers and establishment of Joint Committees as appropriate of the concerned countries to co-operate in the collection of data, exchange of information, flood control and equitable joint management and development.

4. Shlomi Dinar, **“Assessing Side-Payment and Cost-Sharing Patterns in International Water Agreements: The Geographic and Economic Connection,”** Political Geography, Vol. 25, No.4, pp.412-437, 2001.

In this article the author clearly states that to a large degree, conflicts over transboundary freshwater resources arise because property rights have not been clearly defined. International water law provides only hints and suggestions as to how states should resolve their water disputes, since legal principles and clauses are ambiguous and contradictory. But conflict often creates a need for cooperation, which is achieved by means of negotiations, and the specific outcome of negotiations is almost always codified in an international treaty. This article considers bilateral water agreements for rivers with particular geographical configurations and aims to answer a fundamental question: how and why do bilateral treaties vary in their design? Further, it examines international freshwater treaties to deduce the nature of treaty remedies, particularly the side-payment and cost-sharing arrangements, used for resolving conflict over rivers shared by two countries.

The theory and testable hypotheses consider geography and economics in order to explore treaty design. In essence, the ‘willingness to pay’ of one of the states reflects on the property rights solution and can be explained by geography and economics. Three geographical configurations are investigated here. The findings affirm that side-payments frequently occur to offset an asymmetric geographical relationship between upstream and

downstream states, and are commonly regarded as an appropriate instrumentality for solving a property rights dispute. Side-payments are non-existent when the geographic relationship among the riparian's is symmetric and costs for the joint project are most always equally shared. As expected, in the latter case of the article the geography of the river acts as a focal point for equal participation. The author states that when economic differences are taken into account, especially when the upstream state is richer, the side-payment outcome is reversed. As expected, richer states internalize the costs of taking action in favour of poorer downstream states. When the geographical relationship between the riparian's is of a symmetrical nature, while the economic relationship between the states is of an asymmetrical nature, the richer state often assumes the bulk of the cost burden. In this way, it provides a side-payment to the poorer state. Such patterns reveal how property rights disputes over issues such as water quantity, hydropower, pollution abatement, and flood control have been concluded. They suggest how ongoing disputes may be resolved.

5. F. Breis, D. Coates, and F. Loures, “**Transboundary water resources management: the role of international watercourse agreements in implementation of the CBD**”, CBD Technical Series no. 40-48, Secretariat of the Convention on Biological Diversity, Montreal, Canada, 2008.

The author presents an overall outlook of Convention on Biological Diversity in relation with the UN Convention on sharing waters of international rivers. He discusses that water issues in transboundary freshwater ecosystems too often continue to be a source of major contention between riparian States There is a better way—to work together towards common goals, to communicate and cooperate, to not only avoid harm to others but to benefit each other. This indeed is the essence of Article 5 on cooperation of the Convention on Biological Diversity. His document explains why biodiversity conservation and sustainable use present a powerful argument to manage transboundary waters better, how regulatory frameworks to achieve this can be improved and why doing so fulfils commitments made under the Convention on Biological Diversity.

The provisions of the CBD already address the broader issues and needs, particularly

through the programme of work on the biological diversity of inland water ecosystems. But these general provisions need strengthened regulatory frameworks to assist in their implementation at national and international level. In this context, the author investigates the role of the UN Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention) and the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Watercourses Convention) for supporting and strengthening the implementation of the CBD towards the conservation, sustainable use and equitable sharing of biological resources, in particular in regards to the CBD programme of work on the biological diversity of inland water ecosystems.

He asserts that the UN Watercourses Convention and the UNECE Water Convention share common goals with the CBD. All three conventions promote international cooperation as a crucial prerequisite for Parties to achieve their goals. However, the CBD lacks specific rules and principles governing cooperation between watercourse States and promoting the equitable and reasonable use and management of international watercourses. This represents a problem for aquatic biodiversity conservation in transboundary watersheds and the UN Watercourses Convention and the UNECE Water Convention could help address that regulatory gap.

This paper compares the UN Watercourses Convention and the UNECE Water Convention in the context of water allocation and management and the CBD. The author also tried to highlight some similarities between the Convention on Biological Diversity and the two UN Conventions.

6. Suhas Paranjape and K.J. Joy, “**A Million Revolts in the Making: Understanding Water Conflicts**”, India Infrastructure Report, pp- 44-58, 2011.

Through this article the author provides a clear understanding of water conflicts which arise at different levels and the reason behind such conflicts. He points out that due to the complex nature of water, the boundaries of conflicting parties are not easily drawn so a

number of water conflicts arise which are difficult to classify into different types. Conflicts may be over equitable access for a common use conflict between different users but within the same kind of use. Examples could be the conflict between middle class localities and slums over drinking and domestic water, another type of conflict is between contending uses, Conflicts over Water Quality, Conflicts over Dams and Displacement, Conflicts over Privatization and transboundary conflicts. Citing various examples of above conflicts the author views that water is a shared resource that needs to be shared in a spirit of accommodation and cooperation.

7. Douglas Hill, “**Alternative Institutional Arrangements: Managing Transboundary Water Resources in South Asia**”, Harvard Asia Quarterly, pp- 60-66.

The author in this article acknowledges that transboundary water resources are an issue of importance in northern South Asia and that water sharing is contentious both between and within the countries of the region. However, while much has been written about relations between the governments of the region and the various water-sharing treaties that have been enacted at different points in time, there has been little analysis devoted to alternative institutional arrangements that might enhance the effectiveness of regional cooperation. This article argues that a new, transparent regionalism will contribute to a more just and equitable distribution of these water resources. He further states that the settlements between India and its neighbours have been come with political backlash and feelings of enmity in these latter countries. India has consistently refused to countenance multilateral discussions on the issues of transboundary water sharing, and indeed, water-sharing negotiations are conspicuously absent from discussions at the South Asian Association for Regional Cooperation (SAARC), the regional body that would otherwise seem to be an obvious forum for such multilateral coordination.

This paper argues that, in thinking through how a more just and equitable distribution of South Asia’s water resources may occur in the future, it is vital – both as an analytical and a practical task – to escape the “territorial trap” of thinking about transboundary

water resources solely in terms of relations between nation states. While much has been written about the relations between the governments of the region, there has been little attempt to study transboundary networks. The author writes about the role of India's civil society in contesting large-scale dams, but there are few well-functioning networks of South Asian civil society organizations that work to contest similar issues when they occur outside of India's borders.

8. Alan Richards & Nirvikar Singh, **“Inter State Water Disputes in India: Institutions and Policies”**, October 2001.

In this paper the author argues that Indian water-dispute settlement mechanisms are ambiguous and opaque. He distinguishes analytically between situations where cooperation is possible, and situations of pure conflict, where the initial allocation of rights is at stake. In the latter case, a search for a negotiated solution may be futile, and quick movement to arbitration or adjudication may be more efficient. However, he urges that in India, the process is slow, and effectively binding arbitration does not exist. The entanglement of inter-state water disputes with more general centre-state conflicts and political issues compounds problems. He argues that these impacts can be reduced by a more efficient design of mechanisms for negotiating inter-state water disputes. Some of the possibilities include a national water commission independent of daily political pressures, a federated structure incorporating river basin authorities and water user associations.

A key insight of their analysis and discussion is that the existing processes and institutions for resolving inter-state river disputes are not sufficiently well defined or definite. A cooperative bargaining framework suggests that water can be shared efficiently, with compensating transfers as necessary, if initial water rights are well-defined, and if institutions to facilitate and implement cooperative agreements are in place. Our analysis also emphasizes the role of complementary investments, and the need to expand the scope of bargaining to include these where feasible. Furthermore, delay in the dimension of agreement over water can encourage inefficient, non-cooperative

investments in dams, irrigation, etc. An overview of interstate water disputes Act, 1956 has been presented which fails to solve the problem.

9. Sreeradha Datta, “**Indo-Bangladesh relations: An overview of limitations and constraints**”, Strategic Analysis , vol. 26, no. 3, , pp- 427-440, 2002.

Historic links, economic interactions and geostrategic interests make India and Bangladesh vital to each another. As one of the main immediate neighbours surrounding Bangladesh, India naturally occupies a pivotal position in its foreign policy. The geographic conditions, economic interactions, energy supplies, trade links, ethno-cultural proximity and historical linkages provide a plethora of opportunities for close, cordial and co-operative relations between the two countries. Sufficient opportunities and incentives exist for developing relations beneficial to both the parties. However, despite the growing trade linkages and opportunities, fundamental structural problems inhibit the realisation of their full economic potentials. An attempt is made in this paper by the author to examine the factors that limit and constrain the strengthening of Indo-Bangladeshi relations. The paper seeks to examine six broad issues, namely, migration, insurgency, border disputes, anti-Hindu violence, Ganges sharing and trade disputes. On each of these areas, both sides adopt conflicting positions or minimize their relative importance to the bilateral relations.

10. Miah M. Adel, “**Effect on Water Resources from Upstream Water Diversion in the Ganges Basin**’, Journal of Environmental Quality, Vol. 30 No. 2, pp. 356-368, Mar, 2001.

The author in this article articulates the main problem faced by Bangladesh. Bangladesh faces at least 30 upstream water diversion constructions of which Farakka Barrage is the major one. The effects of Farakka Barrage on water resources, socioeconomic, and culture have been investigated downstream in the basins of the Ganges and its distributaries. A diversion of up to 60% of the Ganges water over 25 yr has caused (i) reduction of water in surface water resources, (ii) increased dependence on ground water,

(iii) destruction of the breeding and raising grounds for 109 species of Gangetic fishes and other aquatic species and amphibians, (iv) increased malnutrition, (v) deficiency in soil organic matter content, (vi) change in the agricultural practices, (vii) eradication of inland navigable routes, (viii) outbreak of water-borne diseases, (ix) loss of professions, and (x) obstruction to religious observances and pastimes. Further, arsenopyrites buried in the pre barrage water table have come in contact with air and formed water-soluble compounds of arsenic. Inadequate recharging of ground water hinders the natural cleansing of arsenic, and threatens about 75000000 lives who are likely to use water contaminated with up to 2 mg/L of arsenic. Furthermore, he states that the depletion of surface water resources has caused environmental heating and cooling effects. Apart from these effects, sudden releases of water by the barrage during the flood season cause devastating floods. In consideration of such a heavy toll for the areas downstream, the author views that strict international rules have to be laid down to preserve the riparian ecosystems.

11. Raphael Susewind, **“How "integrated" is the Indian Foreign Service? The example of Farakka, 1982-1997”**, *Journal of International Relations*, Vol. 8, no.2, 2010.

This article examines the role of connections (objective relations between various issues) and linkages (strategic exploitation of said connections) in Indian diplomacy through an analysis of the negotiations leading to the 1997 Farakka water-sharing treaty between India and Bangladesh. It does not intend to contribute another factual summary of the dispute, but rather to use it as an example to illuminate some aspects of the diplomatic strategy and culture of the IFS: “diplomacy is about the means, not the ends, of foreign policy”. While interconnections as such are increasingly recognized in International Relations, few studies have been assessed as how they are embedded (as purposeful linkages) in negotiation strategies.

The article seeks to asks as to what extent and in which particular contexts were India’s diplomatic strategies towards Bangladesh in the negotiations of the 1997 Farakka Treaty influenced by other contentious bilateral issues, namely migration, border security and

economic cooperation? If such connections were perceived by negotiators, were issues deliberately linked or kept apart in negotiations, either to bolster bargaining power or out of a characteristically “integrated” policy? This article concentrates on the period from 1982 to 1997, which also covers “radical readjustments of India’s foreign policy between 1989 and 1996 in the aftermath of the disintegration of the Soviet Union”. Bangladesh as such has been stated as a particularly apt example to bring to light the alleged “integral” nature of IFS(Indian Foreign Service) diplomacy, given that India’s relations with Pakistan – its other large neighbour – are exceptionally militarized and overshadowed by strategic concerns.

This article thus contributes the first ever systematic account of an aspect of the IFS which will become increasingly relevant as the world recognizes that “other functional fields tightly intertwined with political diplomacy” as well as the transition of Bangladesh to democracy in 1991. This sufficiently reduces the dangers of endogeneity and over-determination inherent in single-case short-term research by providing variation in international and domestic context variables. This article argues that integration might be preferred by the IFS for quite different reasons, namely as an expression of its departmental culture and unique Nehruvian approach to diplomacy.

12. Asit K. Biswas, “**Management of International Waters: Opportunities and Constraints**”, *International Journal of Water Resources Development* Vol. 15, Issue 4, 1999.

The author International presents a critical evaluation of international organizations playing role as mediators in conflicts on international water bodies. He asserts that except for Eugene Black, President of the World Bank, who played a critical role in the 1950s on the formulation of the Indus Water Treaty between India and Pakistan, their contributions have been somewhat marginal. These organizations have become increasingly risk-averse during the past three decades, and their leaderships have given the potentially thorny issue of development of international rivers a wide berth. In 1970, the United Nations decided to take up the case of the law of the non-navigable uses of international

watercourses. Some 27 years later, the UN General Assembly approved, on 8 July 1997, a convention on this subject. He further states that the convention, though a useful step, is very broad, general and vague, and thus is likely to be of only limited help to the negotiators on the various international watercourses. But even when the convention is ratified, agreements on the development and management of international water bodies are likely to be achieved only through protracted negotiations between the countries concerned, as has been the case in the past.

13. Cecilia Tortajada, **“Water Governance: Some Critical Issues”**, International Journal of Water Resources Development, Vol. 26, Issue 2, 2010.

The author in this paper presents an analysis of the issues discussed at a special international workshop on water governance. While it is generally accepted that good governance for the water sector is essential, it is also clear that its implementation requires qualitative and quantitative factors, which may vary from one country to another. In order to objectively assess the opportunities and constraints of implementing good water governance practices, a group of selected international experts were invited to address this complex issue.

14. Ashild Kolas, Jason Miklian and Katherine Edelen, **“Water Scarcity in Bangladesh- Transboundary Rivers, Conflict and Cooperation”**, Peace Research Institute Oslo (PRIO), 2013.

In this report the authors present the findings of their primary research on water scarcity in Bangladesh. The methodology of their study combines quantitative and qualitative research. The first section contextualizes current debate on water scarcity in Bangladesh by analysing long-term trends in rainfall and in key transboundary river flows. Stakeholder mapping has been carried out to explore the views and perspectives of a variety of stakeholders in transboundary river water management in Bangladesh, the patterns of communication and interaction between them, the social context surrounding river water management, and how river water users and other stakeholders view the

impact of key projects and treaties. Following the stakeholder analysis the authors return to a quantitative study of the correlation between conflict and extreme weather events, including drought, in an effort to assess whether water scarcity is causing violent local conflicts within Bangladesh.

An attempt has been made to state the indo- Bangladesh water sharing but not to the fullest extent. The history of the Ganges Water Treaty illustrates, negotiations over shared rivers may develop into zero sum bilateral disputes over allocations of transboundary river water. Many interviewees taken by the authors highlighted the lack of communication between policymakers and experts, and the lack of expert independence. The report also investigates water scarcity in Bangladesh and explores institutional mechanisms and strategies for basin wide and multilateral cooperation on the management of transboundary river water.

15. Muhammad Mizanur Rahaman, **“Principles of international water law: creating effective transboundary water resources management,”** Int. J. Sustainable Society, Vol. 1, No. 3, 2009.

In this article the author summarises the principles of international water law related to transboundary water resources management and analyses to what extent these principles are incorporated in recent international conventions and treaties. His study reveals that principle of equitable and reasonable utilisation, obligation not to cause significant harm, principles of cooperation, information exchange, notification, consultation and peaceful settlement of disputes are widely acknowledged by modern international conventions, agreements and treaties. These principles could facilitate effective transboundary water resources management involving riparian countries of shared watercourses and hence, promote sustainable development around the world.

16. Muhammad Mizanur Rahaman, **“The Ganges Water Conflict- A Comparative Analysis of 1977 Agreement and 1996 Treaty”**, The International Water Law Project, 2006 1/2: pp. 195-208.

In his paper the author examines two treaties between Bangladesh and India for sharing waters of the Ganges River and augmenting the flow during lean season. After illustrating the historical evolution of water conflict and cooperation between the two nations, this paper focuses on the water sharing and management provisions of the 1977 Agreement and 1996 Treaty. The paper has two objectives. Firstly, it highlights the historical evolution of water conflict and cooperation between Bangladesh and India. Secondly, it analyses the two sharing Agreements, through the paper an attempt made to resolve water conflict and promote cooperation for the long term solution of the water crisis.

17. Nahid Islam, **“Indo-Bangladesh common rivers: The impact on Bangladesh”**, Contemporary South Asia, Vol. 1, Issue 2, pp. 203-225, 1992.

The author in this article deals with the environmental and legal issues arising from Indo-Bangladesh's economy and society and Bangladesh common rivers, the diplomatic problems over water usage and the impact on Bangladesh's economy and society and indeed its security in the long term. The author further views that India's enormous size, its cultural heritage and the successful endeavours of Indian science, technology and diplomacy have all contributed to its undoubted preeminence in the region. He outlines a gross disparity between India and other countries of the region which gives rise to a considerable feeling of insecurity among smaller states, which is evident over the issue of the common rivers of India and Bangladesh, with India's geographical position at the head of all the major rivers of Bangladesh.

18. Mosharefa Shahjahana & Nick Harvey, **“Integrated basin management for the Ganges: challenges and opportunities,”** International Journal of River Basin Management, Vol. 10, Issue 1, pp- 49-64, 2012.

The paper analyses the challenges of multilateral cooperation towards IRBM(Integrated river basin management) in the Ganges context and examines the scope for overcoming these challenges. The paper argues that IRBM in the Ganges context depends on cooperation towards a basin-wide management approach, and a basin organization is a prerequisite to that. It views the creation of a basin organization in the Ganges context by sharing experiences from other parts of the world and concludes with a framework for adopting IRBM in the Ganges basin.

19. Roshni Chakraborty & Ismail Serageldina, **“Sharing of River Waters among India and its Neighbours in the 21st century: War or Peace? The wars of the next century will be about water”**, Water International, Vol. 29, Issue 2, pp. 201-208, 2004.

The author in this paper intends to comprehend in conceptual terms the extent to which the prevalent water sharing among India and its neighbours is peaceful and whether the water scarcity and population rise in India intensifies the chances for water conflicts. In doing this, he tries to start by addressing the water problems. This paper has concentrated much on the Ganges-Brahmaputra Meghna Basins (GBB), which is the thirteenth largest river basin in the world, densely populated, and shared with a number of neighbours. The current debates opposing plans to link rivers of the Ganga basin and Brahmaputra Barak with water deficient regions such as western and southern India in order to handle drought and floods and water scarcity, in a broad sense, develops insecurities in the minds of rational people on the chances of water conflicts.

20. Alyssa Bakke, “**A Complex River System: Issues Facing the Ganges River**”, Water Resources Paper, May 2002.

The author explicitly draws in this article an examination of the water sharing issues facing the Ganges River and how India and Bangladesh came to a long-term agreement after years of negotiations which further illustrates the complexities facing this river. The economic, environmental and social aspects of the river are discussed as well as how these impact the lower basin of Bangladesh. A comparison of the Ganges River to the Colorado River as a water source for both the U.S and Mexico is made which shows the difficulties of managing a river system that crosses international boundaries. Finally, by examining the Ganges River and the Colorado River, an analysis has been made to show how complicated it can be to manage a transboundary resource.

21. N. Kliota, D. Shmuelia, U. Shamir, “**Institutions for management of transboundary water resources: their nature, characteristics and shortcomings**”, Water Policy 3 pp. 229–255, 2001.

The author in this paper examines the evolution structure and characteristics of the management systems of transboundary river basins: The Mekong, Indus, Ganges–Brahmaputra, the Nile, Jordan, Danube, Elbe, Rio Grande and Colorado, Rio de la Plata, Senegal and Niger. The paper presents the legal principles which guide the legal regime of the studied rivers, particularly the principle of equitable use of transboundary water resources and the obligation not to cause harm in the management of transboundary water resources. The practice of management in the Abovementioned Rivers is divided into three categories:

- (a) Treaties and agreements stopping short of allocating water between riparian states such as free navigation treaties or institutions which were established for a sole purpose such as combating pollution (Elbe, Danube, Rhine).

(b) Treaties and agreements allocating water between states (the Indus, Nile, Ganges, Jordan).

(c) Agreements for joint management of internationally shared waters (Colorado and Rio Grande, Mekong, Senegal and Niger).

The purpose of author in this paper is to explore the nature, characteristics and particular management systems of organizations or institutions which manage international water resources. The author stresses on three specific research areas: the legal and organizational foundations for management of shared water resources, their structure and functions, and their strength and weakness as institutions. The article is divided into two sections. In the first, general principles for the development of organizations for the management of transboundary water resources are presented; in the second part, the structure, functions, strength and weakness of the abovementioned institutions of the 12 river basins are discussed.

Any form of legal research remains incomplete until and unless the relevant statutes on the concerned research topic are examined. Therefore in order to understand the issue of inter country water sharing with reference to Indo-Bangladesh water sharing relevant conventions treaties and statutes have been analyzed and reviewed. They are as follows:-

REPORTS

1. Sergei Vinogradov, Patricia Wouters & Patricia Jones, **“Transforming potential conflict into cooperation potential: The Role of International Water Law”**, PCCP Publications 2001-2003, UNESCO-IHP, pp-106

The present study discusses the relevance and role of international water law in the promotion of cooperation over shared transboundary watercourses. With its focus on actual case studies and through examination of contemporary state practice and detailed

analysis of the 1997 UN Watercourses Convention, this work aims to provide water resource experts from all disciplines with an overview of the rules of international law that govern interstate relations over water. In line with the central theme of the UNESCO project, this legal report focuses on the PCCP cycle: how potential conflicts over water are transformed into cooperation potential. The author discusses tries to explain that from a legal perspective, the PCCP cycle has four identifiable phases, which are connected and reiterative: Phase I. The legal context (the rules of international law that apply to the conflict and its resolution). Phase II. From conflict to cooperation (the means used to transform the conflict into a cooperative arrangement). Phase III. The agreement (the new legal framework). Phase IV. Implementation (how the agreement is implemented and how changing circumstances and potential new conflicts are being dealt with).

Each of these phases is examined through the perspective of international water law, with a particular emphasis on actual state practice. The most important universal legal instrument dealing with international waters is: the 1997 UN Convention on the Non-Navigational Uses of International Watercourses (1997 IWC Convention). This document has been referred to throughout this study as the principal and only universal treaty in this area of international relations to answer the question as given such a range of possibilities for water-related disputes between independent and sovereign nation states, how can international law provide meaningful solutions? How and why do “conflicts” over international waters arise?

Each of these phases is examined through the perspective of international water law, with a particular emphasis on actual state practice. Part One of this report lays the foundation for this work and concludes with an analysis of the Lake Lanoux dispute as a model case study for the PCCP cycle. Part Two provides an overview of the fundamental principles and rules of international law, in general, and those related to international freshwaters, in particular. This sets the stage for understanding Phase I (the legal context) of the PCCP cycle. Part Three identifies the principal causes of water disputes and reviews mechanisms used by states to resolve them, demonstrating how states employ available means of dispute resolution in order to transform conflict into cooperation: Phase II

(Transforming Conflict into Cooperation). Part Four looks at the key elements of a “good” watercourse agreement, one for example that promotes dispute avoidance and provides a flexible regime for managing shared trans-boundary water resources. Finally, part Five provides a summary of lessons learned, and offers a checklist of best practices for states to use in their management of international water resources.

The primary focus here has been made on the issue of “water conflicts,” their principal causes and exigencies. The discussion provides an insight into how various diplomatic and legal techniques of conflict resolution have been used in the past, and will thus inform the process of determination and selection of the optimal conflict resolution mechanisms to be employed in possible future arrangements. Most of these arrangements are spelt out in international agreements, which are guided by the primary rules of international law reflected in the 1997 UN Watercourses Convention.

2. Pal Tamas, **“Water resource scarcity and conflict: review of applicable indicators and systems of reference”**, PCCP Publications 2001-2003, UNESCO-IHP, pp-29

In considering water conflicts the author in this paper takes note the importance of intra-state water tensions, which are related to inter-state conflicts. He asserts that water conflicts are related to a wide range of other socio-political tensions, such as border disputes or mega-projects such as dams and reservoirs, environmental problems, or political identity. A range of instruments may be deployed, including: lobbying, open and hidden negotiations, violence, network building, recourse to international organizations, and the actions of elites. The article considers conflict resolution capabilities, in particular the institutional dimensions, comparing the capacities in developed and developing countries. While most of the items presented in the article are tools for large-scale change, the relevance of incremental advances is also considered. Early warning models to predict the likelihood of conflict are compared, as are risk-assessment models such as that of the Minorities at Risk Project, and conflict prevention trajectories to identify “preventers” of conflict.

3. Dr Patricia K. Wouters, Dr Sergei Vinogradov, Andrew Allan, Patricia Jones, Dr Alistair Rieu-Clarke, **“Sharing Transboundary Waters :An Integrated Assessment of Equitable Entitlement, The Legal Assessment Model** Transboundary Water Resources Management: Using the Law to Develop Effective National Water Strategy”, International Water Law Research Institute, IHP-VI Technical Documents in Hydrology No. 74 UNESCO, Paris, 2005.

More than 40 per cent of the world’s population -- including some of the most poverty stricken -- depend upon water that originates in sources beyond their national borders. But how can they be assured access to adequate water supply and sanitation if their State is subject to the activities of other sovereign entities? When a transboundary watercourse State (TWC State) uses more than its “fair” share of water or pollutes the resources located in its territory, what recourse does the adversely affected State (and its citizens) have? What are the rules of international law that govern TWC State actions and who defines and enforces them? How can a TWC State develop a national water strategy in line with its international legal rights and duties?

In this paper the authors have focused on LAM (Legal Assessment Model) and to answer the above questions. They have stressed that the principal aim of the (LAM) is to provide a methodology for a TWC State to identify, in a systematic way, the parameters of its legal entitlements and obligations with respect to its shared freshwater resources. This LAM offers the basis for developing a strategy that ensures equitable and reasonable access to freshwater resources for all, especially the most disadvantaged. In the whole article the authors have discussed about LAM as how it enables a TWC State to collect and process the data required to identify and comply with its international obligations regarding the use of its shared waters, as well as providing information for the formulation and achievement of National water policy. Such information may be critical in the context of interstate negotiations and joint basin studies, and plays a crucial role in conflict prevention. The selected case studies were chosen to test the model in very different circumstances -- China (upstream on the Mekong), Mozambique (downstream on the Incomati) and Palestine (shared transboundary groundwater).

INTERNATIONAL INSTRUMENTS

HELSINKI RULES OF 1966⁴

The International Law Association, a highly-regarded non-governmental organisation of legal experts founded in 1873, completed the best known study of the customary international law of transboundary water resources in 1966. The result is known as the Helsinki Rules on the Uses of the Waters of International Rivers. The Helsinki Rules were the first attempt by any international association to codify the entire law of international watercourses. The resulting rules have heavily influenced state practice as well as the efforts of other international associations in examining the law of internationally shared fresh waters.

- Although the title of the Rules refers to international rivers only, Article I states that the Rules are applicable to the use of the waters of an international drainage basin. Such a drainage basin is defined as “a geographical area extending over two or more States determined by the watershed limits of the system of waters, including surface and underground waters, flowing into a common terminus”. As such, the Helsinki Rules also apply to groundwater connected to surface water. This is the first time that transboundary groundwater was addressed by any international legal instrument.
- The Helsinki Rules under Article V established the principle of “reasonable and equitable utilization” of the waters of an international drainage basin among the riparian states as the basic principle of international water law. For that purpose, the Helsinki Rules have specified a number of factors for determining the reasonable and equitable share for each basin state.
- Article VI of the Helsinki Rules confirmed the decline of the primacy of navigation by stating that a use or category of uses is not entitled to any inherent preference over any

⁴Adopted by the International Law Association at the fifty-second conference, held at Helsinki in August 1966. Report of the Committee on the Uses of the Waters of International Rivers (London, International Law Association, 1967)

other use or category of uses. The Article, as such, equates all uses of international drainage basins. The Rules also include a chapter on procedures, not only for settlement, but also for the prevention of disputes. The latter part of the chapter deals with notification of other riparian's of any proposed construction or installation that would alter the regime of the basin or give rise to a dispute. As such, the Helsinki Rules. he Helsinki Rules have no formal standing or legally binding effect per se. However, until the adoption of the UN Convention 30 years later, they remained the single most authoritative and widely quoted set of rules for regulating the use and protection of international watercourses cover a wide range of issues, including both navigational and non-navigational uses of international watercourses.

- Some of the bilateral treaties also made specific reference to the Helsinki Rules such as the 1992 Agreement between Namibia and South Africa on the Establishment of a Permanent Water Commission. When India and Bangladesh presented their case on the dispute over the Ganges River to the United Nations in 1975, both relied heavily on the Helsinki Rules. Many of the decisions of the Supreme Court of the United States of America on inter-states water disputes relied on similar factors in determining the water share of each of the riparian states.
- Peaceful Settlement of Disputes, this principle advocates that all states in an international watercourse should seek a settlement of the disputes by peaceful means in case states concerned cannot reach agreement by negotiation. (Article XXVII)
- The Helsinki Rules are insufficient in that they do not provide an answer for what happens when the rule of equitable utilization conflicts with the no-harm rule. Some States have ignored the Helsinki Rules and chosen to follow their own rules or no rules at all. Over the years, these guidelines have played a significant role in the development and codification of international water law.
- However, there are two main problems with the Helsinki Rules. First, the Helsinki Rules can only be enforced on a voluntary basis. States can use the Helsinki Rules as a model

for their own agreements only if they chose to do so. The lack of enforcement power of the Helsinki Rules renders them insufficient to deal with international watercourse issues today.

UN WATERCOURSES CONVENTION⁵

- In 1970, the United Nations (UN) General Assembly commissioned the International Law Commission (ILC) to draft a set of Articles to govern non-navigational uses of transboundary waters. After considerable discussions during 1991 to 1997 on the draft prepared by the ILC, on 21 May 1997, the UN General Assembly adopted the UN Watercourses Convention. This Convention incorporated the principles of transboundary water resources management, building on the 1966 Helsinki Rules. Out of 133 nations, 103 nations voted in favour, 27 nations abstained and three nations voted against the Water Convention Bangladesh and Nepal both voted in favour of the Convention and India abstained.
- The Convention needs 35 instruments of ratification or accession to enter into force. As of this year, 10 years after its adoption, the Convention is still to enter into force. It has only been ratified or acceded to by 16 states, a number far short of that required under the Convention.
- The Convention is a framework convention that aims at ensuring the utilization, development, conservation, management and protection of international watercourses, and promoting optimal and sustainable utilization thereof for present and future generations. As a framework convention, it addresses some basic procedural aspects and few substantive ones, and leaves the details for the riparian states to complement in

⁵Convention on the Law of the Non-navigational Uses of International Watercourses 1997. Adopted by the General Assembly of the United Nations on 21 May 1997. The 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses is the only treaty governing shared freshwater resources that is of universal applicability. It is a framework convention, in the sense that it provides a framework of principles and rules that may be applied and adjusted to suit the characteristics of particular international watercourses

agreements that would take into account the specific characteristics of the watercourse in question. Such agreements can adopt or adjust the provisions of the Convention.

- The Convention is divided into seven parts and consists of 37 Articles. In addition, it includes an Annex on arbitration. The main areas that the Convention addresses include the definition of the term ‘watercourse’; watercourses agreements; equitable and reasonable utilization and the obligation not to cause harm; planned measures; protection, preservation and management; and dispute settlement.
- Similar to the Helsinki Rules, the Convention embraces the principle of equitable and reasonable utilization, and lays down in Article 6 certain factors and circumstances that should be taken into account for determining such equitable and reasonable utilization. Article VI (1) of the Convention states that utilization of an international watercourse in an equitable and reasonable manner, within the meaning of Article V, requires taking into account all relevant factors and circumstances.
- A careful reading of Articles V, VI and VII of the Convention should lead to the conclusion that the obligation not to cause harm has indeed been subordinated to the principle of equitable and reasonable utilization. Hence, it can be concluded that, similar to the Helsinki Rules, the principle of equitable and reasonable utilization is the fundamental principle of the UN Watercourses Convention.
- The Convention also includes a detailed part on the environment entitled ‘Protection, Preservation and Management’ of international watercourses. Article XXXIII and the Annex to the Convention deal with dispute settlement mechanisms and procedures. The Article lays down a number of methods for settlement of disputes, including negotiations, jointly seeking the good offices of, or mediation and conciliation by a third party, or use of joint watercourse institutions, or submission of the dispute to arbitration or to the International Court of Justice.

- Although the UN Watercourses Convention is based largely on the Helsinki Rules, the political compromise introduced by the Working Group on the relationship between equitable and reasonable utilization and the obligation not to cause harm has generated considerable ambiguity for some states as to which principle prevails. The Berlin Rules have exacerbated this confusion.
- As of December 2006, only 16 countries have ratified or acceded to the Convention. The reasons for the reluctance of the states to ratify or accede to the Convention and the valid question that arise is why have Bangladesh and Nepal not ratified or acceded to the Convention, even though both voted for the adoption of the Convention needs to be researched. Even when agreements exist, interpretation and implementation of these agreements has not been an easy task. As a result, disputes over shared waters are on the increase, and now cover a wide array of issues that go beyond quantity and quality of the shared waters.

THE BERLIN RULES⁶

- In 1997, the year the UN Convention was adopted, the Water Resources Committee of the ILA started considering the question of how to proceed with the revisions of the Helsinki Rules. Discussions took place during the ILA conference in London in 2000 and the revision process continued after that conference. The Committee presented its third report at the New Delhi Conference in 2002 where it was agreed to set a goal of completing the project by 2004. During the Gent meeting of the Water Resources Committee in March 2004, the 11 members of the Committee who attended the meeting (out of the 22 members) completed the work and voted unanimously to present the revised set of rules to the ILA. The rules were discussed and approved during the ILA Seventy-first Conference held in Berlin in August 2004. The previous title of the rules ‘The Revised ILA Rules on Equitable and Sustainable Uses in the Management of Waters’ was changed, and a new title ‘The Berlin Rules on Water Resources’ replaced it.

⁶The Berlin Rules replace the Helsinki Rules on the Use of Waters of International Rivers, approved by the Association in 1966.

- The Berlin Rules are quite comprehensive and detailed. They consist of 73 Articles, divided into 14 chapters, covering various issues on water resources which go beyond the Helsinki Rules and the UN Watercourses Convention. The Report of the Water Resources Committee stated that the Rules incorporate the experience of the nearly four decades
- It is also worth noting that a number of the Berlin Rules are applicable to the management of all waters, both national and international. This is indeed a major deviation by the ILA from its entire previous work that dealt exclusively with international rivers, international drainage basins and trans-boundary groundwater.
- Chapter II of the Berlin Rules addresses various issues related to all waters, ranging from participation of persons likely to be affected by decisions concerning the management of waters. Chapter III applies to internationally shared waters. Article XII states that: Basin States shall in their respective territories manage the waters of an international drainage basin in an equitable and reasonable manner having due regard for the obligation not to cause significant harm to other basin States.
- The major distinction between the Helsinki Rules and the UN Convention on the one hand, and the Berlin Rules on the other, is that the former establish and emphasize the right of each basin state to a reasonable and equitable share. This is based on the concept of equality of all riparian states in the use of the shared watercourse. On the other hand, the Berlin Rules obliges each basin state to manage the waters of an international drainage basin in an equitable and reasonable manner. Thus, whereas the Helsinki Rules and the UN Convention establish and emphasize the right of each of the riparian states to a reasonable and equitable share, the Berlin Rules emphasize the obligation to manage the shared watercourse in an equitable and reasonable manner.
- After subjecting the principle of equitable and reasonable utilization to the obligation not to cause significant harm, as stipulated in Article 12, the Berlin Rules addressed significant harm separately in Article 16. That Article requires the basin states, in managing the waters of an international drainage basin, to refrain from and prevent acts

or omissions within their territory that cause significant harm to another basin state “having due regard for the right of each basin State to make equitable and reasonable use of the waters”.

- Over-view of the Berlin Rules indicates that the Rules have drawn heavily from the Helsinki Rules and the UN Watercourses Convention. However, three basic features distinguish the Berlin Rules from their predecessors. First, a number of the provisions of the Berlin Rules apply to both national as well as international waters. This is a marked departure from all other international water law instruments that apply strictly to shared waters. Second, the Berlin Rules have gone beyond what the ILC considered as established principles of customary international law, and incorporated emerging principles as well. This approach differs from the Helsinki Rules which reflect the established principles only. Similarly, the UN Watercourses Convention reflects, as widely agreed, the basic established principles of customary international law.

GANGES WATER TREATY (1996)

- After the commissioning of the Farakka Barrage along the mainstream of the Ganges in 1975 and subsequent conflict regarding the water shortage in downstream Bangladesh, Bangladesh and India signed two treaties (1977 and 1996) and two MoU (1983 and 1985) for sharing the Ganges waters at Farakka. On 12 December 1996, the two governments signed the most recent Treaty for sharing the Ganges waters at Farakka during the dry season (1 January to 31 May). This Treaty is valid for 30 years. Article II, Annexure I and II of the 1996 Ganges Treaty establishes the formula for water sharing of the Ganges at Farakka during the dry season. Annexure II provides an indicative schedule of the sharing arrangement based on 40 years (1949–88), a 10-day period average availability of water at Farakka.
- Articles IV to VII of the Treaty establish the Joint Committee and its jurisdiction for monitoring the Treaty and exchanging data and information.

- The Preamble of the Treaty notes that both countries wish to share the waters of international rivers and optimally utilize the water resources of the region in the field of floods management, irrigation, river basin development and hydropower generation for the mutual benefit of the people of the two countries. Although oblique, the inclusion of these issues could result in the cooperation of other water related issues and hence promote overall Ganges basin development.
- The Preamble and Article VIII recognize the need to cooperate to find a solution to the long-term problem of augmenting the flow of Ganges during the dry season. These Articles approve the principle of cooperation and information exchange.
- On sharing of ‘common rivers; Article IX obliges India to conclude to ‘water sharing agreements’ with Bangladesh on principles of equity, fairness and no harm to either party. But the real problem is different. Although a 30 year water treaty has been in effect between the two countries since 1996, it has been seen that India diverted water according to its own will, depriving Bangladesh from her just share during dry season. It ultimately discourages unilateral development on the other common river and agreed to conclude water sharing Treaties Agreements.
- Treaty does not include clear dispute resolution and arbitration mechanisms. The preamble of the Treaty mentions that both Parties wish to find a fair and just solution without affecting the rights and entitlements of either country. Article VII states that if the Joint Committee fails to resolve conflicts arising out of the implementation of the Treaty, it should be referred to the Indo-Bangladesh Joint River Commission. If the difference or dispute still remains unresolved, it should be referred to the two governments, which would meet urgently at the appropriate level to resolve it by mutual discussion. What level of government it refers to and what the timeframe is for the settlement of disputes are not specified in the Treaty. In addition, the Treaty does not bind any Party to resolve the dispute if a disagreements persist.

THE INDO-BANGLADESH WATER TREATY⁷

The treaty was entered into by the two nations India and Bangladesh in the year 1996 aiming at resolving the on-going conflict primarily centered on the sharing of the waters of River Ganges, that originated way back in 1951, when Bangladesh formed a part of East Pakistan, due to the construction of the Farakka bridge and the allocation and use of the river Ganga, flowing from Northern India into Bangladesh. Following a series of tensions, dialogues and bilateral discussions on the said issue, a water sharing agreement was formulated thereby executed between the leaders in 1996. The 1996 water treaty is the most crucial development and possessed a validity of 30 long years. The Preamble of the Treaty notes that both countries wish to share the waters of international rivers and optimally utilize the water resources of the region countries. The Annexure I and II discuss the mode of allocation of water between the two riparian states. Further, to prevent future conflicts, a Joint Committee and a dispute resolution mechanism is established. Moreover, water sharing between the two countries is to be guided by the “principles of equity, fairness and no harm”, thus indicating application of internationally recognized principles to the dispute.

The treaty fails to provide for a minimum guarantee clause of amount of water being shared and allocated. Further, there is a lack of efficient dispute resolution and arbitration mechanisms. Art. VII specifies that in an event of a conflict, the dispute is to be referred to the Joint Committee, who if fails to resolve conflicts arising out of the implementation of the Treaty, then it is to be referred to the Indo- Bangladesh Joint River Commission. If the difference or dispute still remains unresolved, it should be referred to the two governments, which would meet urgently at the appropriate level to resolve it by mutual discussion. There exists an conundrum on the level of government referred to, moreover no specific timeframe is provided for the settlement of disputes. In addition, the Treaty does not bind any party to resolve the dispute if a disagreements persist. Despite their being a water sharing agreement, water conflict between the two countries has only

⁷Treaty between the Government of the Republic of India and the Government of the Republic of Bangladesh on the Sharing of the Ganges Waters at Farakka , signed on 12-12-1996

further escalated. Thus, the possible solutions for the same would be researched upon.

THE TEESTA AGREEMENT⁸

The Teesta agreement over the sharing of Teesta River is a major irritant between the two countries. Teesta is one of the major transboundary rivers, in the basin between India and Bangladesh. The dispute emanates by the demand of constructing a barrage across the Teesta that saw major opposition by Bangladesh, claiming loss of agriculture. The issue saw many ad-hoc agreements and negotiations over the allocation of the waters of the Teesta between the two claimants. In 2013, attempts were made to resolve the said issue by allocation of the waters in a proposed ratio of 50:50 in the lean crop season. India by way of this claims 55% of the share, leaving Bangladesh with the remaining 45%. The proposed treaty however, lacks formal authority and legal backing and does not contain any dispute mechanisms to be resorted to, in future in case of any disagreement with respect to Teesta water sharing. Another major being flaw being the lack of mutual trust and confidence between the two governments with respect to the usage in the lean period. There is hence a need for an overarching mechanism in place for both the countries for proper governance of the regulation of sharing and efficient allocation of the Teesta waters.

⁸Agreement between the Government of the Republic of India and the Government of People's republic of Bangladesh on the access and use of the Teesta River.

POLICIES AND LEGISLATIONS:

1. **National Water Policy, 2002**⁹: The National Water Policy was promulgated with the aim of treating water as an economic good, which requires accurate conservation and efficient use. It seeks to govern the planning and development of water resources; thereby ensuring optimum utilization. This it seeks to achieve by implementing measures such as establishment of standardized data base, recycling of water for maximum availability and setting water allocation priorities. The policy lacks in following the polluter pay principle.

2. **River Boards Act, 1956**:¹⁰The act intends to provide a framework for setting up of river boards by the CG to advise governments, concerning the use, allocation and development of river valleys and inter – state rivers.

3. **Indus Water Treaty, 1960**¹¹: The said treaty governs the utilization of waters of the River Indus between the two republics; India and Pakistan for 56 long years. Allocation and use of rivers Jhelum, Beas, Ravi, Chenab and Sutlej is further facilitated through the said treaty. The treaty establishes the Indus Commission for implementation in an effective manner.

4. **Mahakali Water Treaty, 1996**¹²: The said agreement entered concerns the integrated development of the Mahakali River including the Sarada Barrage, the Tanakpur Barrage and the Pancheswar Project. The treaty contains provisions concerning arbitration in event of a dispute. Despite its operation, its implementation is tardy.

5. **Inter-State River Water Disputes Act, 1956**¹³: The Act stems from Art. 262 of the Constitution and thus aims to resolve disputes among states pertaining to the use, control and allocation of an inter-state river. This particularly has implications of the sharing of

⁹ New National Water Policy, 2002

¹⁰River Boards Act, 1956 (Act 49 of 1956)

¹¹ Treaty between the Government of India and the Government of Pakistan

¹² Government of Nepal and the Government of India.

¹³Inter-State River Water Disputes Act, 1956 (Act 33 of 1956)

trans-boundary Rivers such as the Ganges, which flows through regions of North India; thus entering Bangladesh.