India-Bangladesh Transboundary Water Sharing Conflict: Emerging Principles of Cooperation on Shared Water Resources

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List of abbreviations

BELA	Bangladesh Environmental Lawyers Association
EC	European Community
ECE	UN Economic Commission for Europe
EIA	Environmental Impact Assessment
EIA	Environmental Impact Assessment
EU	European Union
EUWFD	EU Water Framework Directive
GBM	Ganges-Brahmaputra-Meghna Basin
GDP	Gross Domestic Product
ICESCR	International Covenant on Economic, Social and Cultural
ICJ	International Court of Justice
ILA	International Law Association
IJC	US-Canada Water Commission
ILC	International Law Commission
ITLOS	International Tribunal for the Law of the Sea
IUCN	The World Conservation Union
IUCN	The World Conservation Union
IWRM	Integrated Water Resources Management
IWRM	Water Resource Management
JRC	Joint River Commission
MDG	Millennium Development Goals
NAFTA	North American Free Trade Agreement

NGOs	Non-Governmental Organizations
NBA	The Niger Basin Authority
OMVS	Senegal River Development Orga nization
PCA	Permanent Court of Arbitration
	Rights
RLP	River-Lilinking Project
SADC	Southern African Development Community
TVA	Tennessee Valley Authority
UN	United Nations
UNEP	United Nations Environment Programme
UNCED	UN Conference on Environment and Development
UNEP	UN Environment Programme
UNGA	UN General Assembly
WSSD	World Summit on Sustainable Development
WSSD	World Summit on Sustainable Development
WCD	World Commission on Dams

Table of treaties

Treaty between the Hungarian People's Republic and the Czechoslovak Socialist Republic Concerning the Construction and Operation of the Gabcikovo-Nagymaros System of Locks, Sept. 16, 1977, The 1977 Treaty came into force on June 30, 1978

Treaty between the United States and Mexico relating to the utilization of the waters of the Colorado and Tijuana Rivers and of the Rio Grande (Rio Bravo) from Fort Quitam, Texas, to the Gulf of Mexico, signed at Washington on 3 February1944, and supplementary Protocol, signed at Washington on 14 November 1944.

UN Convention on the Law of the Non-Navigational Uses of International Watercourses, New York, 21 May 1997, not in force, 36 *ILM* (1997)

Vienna Convention for the Protection of the Ozone Layer, 22 Mar. 1985, Art. 4, 261. L. M. 1529, 1530-1531.

ABSTRACT

The research study attempts to identify the present state of disputes against the equitable share of international rivers and scope of various conflict resolution mechanisms as they exist in the existing bilateral mechanism between India and Bangladesh. Against this backdrop, the study focused on water allocation issues associated with the *Ganges, Brahmaputra and Meghna* river system, particularly highlighting the issues concerning the sharing of the Ganges water and the river linking project proposed by upper riparian India that may turn as nightmare for down stream Bangladesh. Since international rivers concern the international community and each region may learn from the other, the study also analyzed the comprehensive framework of international law and also some regional instruments from the aspects of the equitable and reasonable water allocation and sustainable utilization of international water resources. The idea was to prepare the grounds for Bangladesh to argue against the unilateral plans of India over common rivers. Comparative study of the various institutional mechanisms set up for the different international river basins reflected the importance of effective institutional arrangements and concluded by stressing on cooperation among the Bangladesh, India and Nepal to utilize the potential opportunities of Eastern Himalayan Rivers .

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Introduction

More than 200 transboundary water systems exist in the world, with their basins shared by two or more riparian states. A large fraction of the global population as much as 60 per cent - depends on these international water systems.[1] At the same time, these water systems support invaluable natural ecosystems extending across one or more international boundaries. Many of such international water basins pose serious environmental, social and also political problems due to the increasing pressures of economic development and competition for scarce resources. The persistent growth in world population and economic development has resulted in tremendous pressure on existing sources of fresh water. Human water use over the past three centuries increased by a factor of thirty-five and is growing by four to eight percent annually[2]. Coupled with recurring international disputes over water resources, poor water management, and the realization that water is an indispensable but finite resource, these trends have propelled the use and management of transboundary water resources to the forefront of legal debate.[3]

Ensuring collaboration among nations sharing water bodies is critical to achieving sustainable use of the shared water resources and defusing potential tensions. However, because of the geopolitical concerns and varied implications for the nations concerned, this is by no means an easy task. Having in mind how their well-being depends on an equitable access to freshwater, it becomes quite clear that the settlement of basin-wide disputes over water is a very important topic. The

[1] Mikiyasu Nakayama, Libor Jansky, Kumi Furuyashiki, *International Water Systems Project of the United Nations University*, available at: http://202.253.138.71/ENV/Files/LEAD-Nakayama-abstract.pdf.
[2] Gabriel Eckstein, Application of International Water Law to Transboundary Groundwater Resources, and the Slovak-Hungarian Dispute Over Gabcikovo-Nagymaros, 19 Suffolk Transnat'l L.R. 67 (1995), Pp.1.
[3] *Ibid.*

protection of rights also implies, in the case of international water resources or transboundary basins, an obligation of equitable use by riparian countries through appropriate cooperation mechanisms.[4]

However, the transboundary water disputes among the South Asian countries provide a classical example of the continuousness of the issues involved in the management of international river basins. The *Ganges-Brahmaputra-Meghna* basin contains the largest number of the world's poor in any one region[5]. The region is endowed with considerable natural resources that could be used to foster sustainable economic development. Water could be successfully used as the engine to promote economic development through an integrated approach, of the region, which has been hindered because the most populous part of the basin is shared by three countries: Bangladesh, India, and Nepal who have in the past been unable to agree to an integrated development plan. Cooperation between the countries concerned and by taking a holistic development approach, the quality of life of the people of the basin could be improved significantly within a reasonable timeframe.[6]

Farakka Barrage[7] that instigated water conflict between India and Bangladesh was constructed in 1975 by the Indian government to divert the *Ganges*[8] water for improving the navigability at the Calcutta Port. The unilateral withdrawal of the transboundary river *Ganges* water has caused both long-term and short-term effects in

[4]This concept of equitable use was codified in the 1997 UN Convention on the Law of Non-Navigational Uses of International Watercourses (Article 5 - "Equitable and reasonable utilization and participation".

[5] Asit K. Biswas and Juha I. Uitto. edited by. *Sustainable Development of the Ganges-Brahmaputra-Meghna Basins*, United Nations University Press, New York, 2001

[6] *Ibid.*

[7] *Farakka Barrage* over the transboundary river Ganges constructed by India in 1975, about 18 km upstream near Monohorpur, to save Calcutta Port from silting. Actual work on the Barrage started in 1961 and was completed in 1971. The Barrage is about 2.240 meters long. The Barrage went into operation on 21 April 1975

[8] The Ganges River and its tributaries and distributaries flow through three countries: India, Nepal, and Bangladesh, begins in the central Himalayas and flows 2,500 kilometers to the Bay of Bengal.

Bangladesh leading to destruction of the ecological and environmental system of Bangladesh posing a serious threat to sectors such as agriculture, industry, forestry and navigation that leads detrimental effects on life and livelihood of the people of Bangladesh. Unilateral withdraw of water from *Ganges* and its adverse impact may be sufficient to determine the significant harm occurred as a direct result of the diversion of the river. Therefore, the operation of the *Farakka Barrage* supports the contention that India violates the principle of the obligation not to cause appreciable harm. International law and principles may help bring about a balance between the different competing interests and to protect both people and the environment.

The issue of transboundary water sharing has come into the forefront in the discussion through the proposed Indian river inter-linking project. The Indian proposed national water project that involve linking the *Ganges, Brahmaputra* and *Meghna* which are inter-state rivers flow to Bangladesh. The Indian government got judicial sanction from its Supreme Court in October 2002 to implement its scheme on linking major Indian rivers to overcome droughts and floods. [9] However, this is alarming for Bangladesh as lower riparian country since the flow of these international rivers will be reduced that would generate devastating effects on irrigation, agricultural production, biodiversity, natural environment and ecology and consequently, will lead to displacement of huge number of population of Bangladesh.

These are international rivers in character and their utilization clearly fall within the purview of international law. The commitment of UN Millennium Declaration states that: 'To stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote

[9] Writ Petition (Civil) No. 512/2002, "In Re: Networking of Rivers", October 31, 2002, Supreme Court of India.

both equitable access and adequate supplies.'[10] The international law on freshwater resources does not necessarily contribute to sustainable development and although international law on sustainable development is emerging. The principles of international law that stimulate sustainable development of freshwater resources ensuring sound environment and ecological order need to be further identified and analyzed to justify the validity of Indian proposal from the perspective of international law.

In the backdrop of the above situation, and considering the national and regional interest on the issue of equitable share of transboundary water resources from the aspect of human rights, sustainable development and environment, this thesis paper will examine the legal implications of unilateral withdrawal of water by the India from an international river. Particularly, in this research study, issues those are identified includes equitable share of Ganges water, pollution of transboundary river from the aspects of water quantity and quality and proposed Indian river-linking project that suppose to divert the water from the international rivers.

The purpose of this paper is to examine the existing and emerging legal norms and principles that provide the options for peaceful dispute resolutions, guidance for ensuring sustainable shared water resource management and policy implication to meet the future challenges. Exploring the notion of sustainable transboundary water resource management and the relevancy of international laws in relating to water management requires for a thorough analysis of a whole range of the issues. Therefore, the first step is to identify the present state of the transnational water resource management within the international legal framework. The subsidiary sources complemented with bilateral and multilateral agreements between states,

[10] UN Millennium Declaration Chapter VI, Para. 23.

those have been developed over the decades. The potential relevancy of international law to water management is stressed by the existence of over 200 international river basins shared by two or more states.

The judgments or advisory opinions of the International Court of Justice (ICJ), as well as judgments of other international tribunals and national courts are only binding between the parties but they can be of great significance in the interpretation and further definition of international law. Furthermore, instruments of "soft law", although not legally binding *stricto senso*, can have enormous impact and can be an additional secondary source of law, filling the gaps, guiding interpretations, or revealing the emergence of international law.[11] Moreover, the writings of authors of great authority and work of institutions such as ILA also influence the interpretation and evolution of international law.

An overall assessment of how international law can contribute to ensure sustainable development and management of transboundary water resources and to settle the disputes through peaceful mechanisms would lead to formulate policy recommendations for the case of India-Bangladesh water dispute. Therefore, firstly, it is important to understand the background and historical context of the water conflict issues between India and Bangladesh, and to examine critically the causes of the environment and ecological adverse impacts. Thus the first chapter deals with these issues. Secondly, once these issues have been identified and the existing level of knowledge regarding them is determined, the second and third chapters will analyze the issues in the context of existing and emerging legal norm and principles of international law concerning water, environment and development. Moreoevr, third chapter deals with the emerging principles of technical cooperation, those which require

effective institutional mechanisms to implement and monitor the joint efforts initiated by the concerned basin states. The Fourth chapter dealss with a comparative study on institutional arrangements of different international river basins management. Discussions and analysis of these chapters lead to the formulation of specific recommendations in favor of Bangladesh for policy making decisions and strategies to address the issues at the bilateral, regional and international level for peaceful settlement of the transbounday water conflict with India.

Chapter One

The gap between the supply of and demand for fresh water has been widening over the past century worldwide, due to such factors as population growth, urbanization and an increase of water consumption per capita and the water disputes in the South Asia reflects this view entirely. The problem of water resource allocation and sharing, primarily for irrigation purposes, has plagued relations between India and its neighbors in this region. Particularly, existing dispute on equitable water sharing of Ganges and proposed riverlinking project created a huge tension between India and Bangladesh.

However, water allocation issues associated with the *Ganges, Brahmaputra and Meghna* river system regarding equitable share of Ganges water and diversion of water from other rivers through proposed river linking project by India and adverse impacts on Bangladesh are the central focus of this chapter. The Ganges river dispute between India and Bangladesh has continued to fester despite a recent treaty signed in 1996. Therefore, this chapter initially deals with the background, historical context of the conflicts and cooperation between the countries and then analyzes the key issues

[11] The ICJ in the *Nicaragua* case and the *Advisory Opinion on the Legality of Nuclear Weapons* underlined the importance of sources of international law such as UNGA Resolutions.

and consequential adverse impacts and ability of existing treaty to ensure equitable and reasonable management of shared water resources between the countries.

1.1. Ganges-Brahmaputra-Meghna Basin (GBM) and Bangladesh

The *Ganges-Brahmaputra-Meghna* river system second largest hydrological region in the world, shared by Bangladesh, Bhutan, India and Nepal, flowing from the Himalayans in Nepal and Tibet, through India and ultimately joins in Bangladesh where they discharge into the Bay of Bengal. Rivers and river water have always played the central role in the social, economic and cultural development of the south Asia. The region comprises some of the world's most fertile agricultural lands and its economy basically based on agriculture. Due to seasonal variation the whole region is prone to common problems of flood and drought, salinity intrusion from Bay of Bengal (India and Bangladesh) that cause immense harm for agriculture, drinking water and industrial shortage of water. [12] Hence proper utilization of water and water resources is crucial for the peoples of Bangladesh, Bhutan, India and Nepal. A growing population and the recent accelerated economic activities in this region have made water resource management more complicated. However, this region has great potential for improving their economic and social conditions by utilizing the water recourses through regional cooperation.

Bangladesh is a deltaic land cress-crossed by 200 large and small rivers. Most of those have originated from three major international rivers - the *Ganges*, the *Brahmaputra* and the *Meghna* and their tributaries and distributaries. There are 57 international rivers flow through Bangladesh out of which 54 rivers enter Bangladesh

[12] R Rangachari and B G Verghese, *Making Water Work to Translate Poverty into prosperity: GBM Region***,** Supra note, 12, Pp, 84.

from India and rest three from Myanmar.[13] Approximately half of the country's GDP is based on agriculture, and hence these rivers' irrigation value is vital to the country's economy and its over 130 million inhabitants.[14] Not only the economy its environment, ecosystem, navigation, culture, religion and livelihood are directly or indirectly governed by water as usual. The rivers of Bangladesh are the major source of this water. The topography of Bangladesh (i.e. its sea level elevation and delta wetlands) and its geographical location make it extremely vulnerable to natural disasters. Typhoons and monsoons produce multiple floods almost on an annual basis, and during the dry season between January and May, the Ganges river may drop to levels that have a strong detrimental impact on agriculture and fisheries.[15] Relations between Bangladesh and its neighbour to the west, India, have been hardly cordial at best and there has been a continuing dispute over the allocation of Ganges water between the two states.

1.1.1. Background of the India-Bangladesh water dispute

The origin of the conflict dates back to 1951 when Bangladesh was part of Pakistan (was known as East Pakistan). India began plans for the construction of a mile-long "barrage" at *Farakka,* 18 km from the Bangladeshi border, to increase the diversion of *Ganges* water to the Bhagirathi-Hooghly river to flush silt and keep Calcutta harbour operational during the dry season.[16] However, the government of Pakistan drew the attention of the Indian government to the dangers of their scheme for diverting a large amount of dry season flow from the Ganges. India replied in 1952 that the project was only under preliminary investigation and described

[13] Syed Azizul Haq, *International River Linking by India: Anticipated Environmental Impact in Bangladesh and Management Approach*, 2005.
[14] Q.K. Ahmed, *Converting Water into Wealth: Regional Cooperation in Harnessing the Eastern Himalayan Rivers,* Academic Publishers, 1994. Pp. 7.
[15] Q K Ahmed, Ahsan U Ahmed, H R Khan and KBS Rasheed, *GBM Regional Water Vision: Bangladesh Perspective,* Supra note, 12, Pp. 37

Pakistan's concern over possible effects as purely hypothetical. Thus began the long history of negotiations on the sharing of the Ganges water. In the years up to 1970, the governments of Pakistan and India discussed the issue many times at different levels, starting from technical experts to the heads of government.[17] But even as discussions went on, India kept working on the construction of the *Farakka Barrage*, and completed it in 1970.

In 1971, Bangladesh became an independent nation, with India aiding it in its independence struggle against Pakistan. It was expected that better relations between India and Bangladesh would result, but India persisted with its Farakka plans, and this led to a general souring of the relationship. However, the Indo-Bangladesh joint river commission (JRC)[18] was constituted in 1972. The prime ministers of Bangladesh and India, in a joint declaration on 16 May 1974, expressed their determination that before the *Farakka* project would be commissioned they would arrive at a mutually acceptable allocation of the water available during the periods of minimum flow in the Ganges.

While India did not respond to a lawful right of fair, equitable and just sharing of waters of the Ganges in 1976, Bangladesh approached the UN General Assembly and India was compelled to agree with a Consensus Statement of the President of the UN General Assembly adopted on 26th November 1976. As a result Ganges Water Agreement, 1977 was adopted on sharing of the *Ganges* waters at *Farakka* and on augmenting its Flows was signed by the two countries. The treaty guaranteed a

[16] Swain, A., *Conflicts over Water: The Ganges Water Dispute*, *Security Dialogue*, Vol. 24, No. 4, 1993.
[17] Source: Banglapedia, National Encyclopedia of Bangladesh, *Asiatic Society of Bangladesh*
[18] Joint Rivers Commission (JRC) established on 19 March 1972 in Dhaka, pursuant to the joint declaration of the prime ministers of India and Bangladesh signed by Sheikh Mujibur Rahman, Prime Minister of Bangladesh and Mrs. Indira Gandhi, Prime Minister of India. The JRC started functioning from June 1972 although the Statute of the Indo Bangladesh Joint Rivers Commission was signed in Dhaka on 24 November 1972. There is a counterpart JRC for India and is based in New Delhi, India.

minimum flow level for Bangladesh for a five year period. After its expiration in 1982, two more short-term agreements were concluded on water sharing until 1988. Thereafter, India began unilateral diversions at its will.

However, the political climate began to change when in 1992 the prime ministers of the two countries met and agreed to renew the efforts to reach a solution. Subsequently, in December of 1996 the Ganges Water Sharing Treaty (Herewith Ganges Treaty) was signed that is supposed to last for thirty years.[19] A new atmosphere of regional cooperation was created by singing the treaty and hence it requires examining closely the provisions adopted in the treaty to ensure equitable share of Ganges water. Next section analyzes the provisions of the treaty critically.

1.1.2. Conflict, Cooperation and the Ganges Treaty regime

The Treaty addresses the heart of the conflict: water allocation during the five months of the dry season (January-May). During the rest of the year, there is sufficient water that India can operate the Farakka diversion without creating problems for Bangladesh. However, increasing upstream withdrawal in Northern India has further lowered the dry-season flow at Farakka, further complicating matters. Hence, the Treaty stipulates that below a certain flow rate, India and Bangladesh will each share half of the water. Now it is important to look at the basic features of the treaty**.**

Sharing of water

The 1996 Treaty establishes a new formula for sharing the Ganges waters at Farakka in the dry season (1 January to 31 May), also providing that below Farakka

[19] Treaty Between the government of the Republic of India and the government of the People's Republic of Bangladesh on Sharing of the Ganga/ Ganges Waters at Farakka, Signed on December 12, 1996.

the waters are not to be reduced further except for "reasonable use" in a limited amount.[20] The new arrangement is as follows:

- During the period from 1 March to 31 May, the sharing will be on the basis of a so-called hydraulic cycle, where one side will have 35000 cusec (cubic feet per second) guaranteed flow and the other side will receive the rest of the flow. In a cycle where the flow is 50,000 cusec, India will receive 35,000 cusec and Bangladesh will receive 15000 cusec.
- When the flow falls below 50,000 cusec no sharing principle will exist; Bangladesh and India will sit immediately to decide equitable sharing.
- The sharing arrangements are to be reviewed every five years and if no agreement can be reached on adjustments, India is to release at least 90% of Bangladesh's share as provided by Article II.

It is interesting that the Treaty is overwhelmingly concerned about sharing water in the lean flow periods. It does not recognize the fact that the River poses a two pronged problem for the region; namely, the water scarcity in the lean season and severe floods in the monsoon season.

Institutional mechanism within the Treaty

According to treaty provision of Article IV, a Joint Committee would be established composed of an equal number of members appointed by both governments.[21] Article (V) allows the Joint Committee to draft its own working rules. Article (VII) deals with the dispute settlement mechanism in the Treaty: "Any difference or dispute arising in this regard, if not resolved by the Joint Committee, shall be referred to the Indo-Bangladesh Joint Rivers Commission. If the difference or

[20] Ganges Water Treaty, Article III,

dispute still remains unresolved, it shall be referred to the two governments which shall meet urgently at the appropriate level to resolve it by mutual discussion". Article IX of the Treaty stated, "Guided by the principles of equity, fairness and no harm to either party, both the Governments agree to conclude water-sharing Treaties/Agreements with regard to other common rivers".[22]

1.2. India's Proposed River-linking Project: Future Challenges

The Government of India is proceeding with a mega project to divert vast quantities of water from major rivers shared with Bangladesh, including the Brahmaputra and the Ganges ignoring the interests of Bangladesh as a lower riparian country. In the absence of any official communication from the Government of India, the initial information from few orders of the Indian Supreme Court and other informal sources reveals that the project is to be implemented by 2016 that has given rise to serious concern amongst the people of Bangladesh.

The Proposed Indian River-linking Project (RLP)

In 1980, the Indian Ministry of Water Resources produced the "National Perspective Plan" in order to transfer water from one region to another. The National Water Development Agency (NWDA) was established under that Plan to complete the feasibility studies of the proposed links. After detailed studies, the NWDA selected 30 link canals for final feasibility study and completed final reports for 6 of those link canals. The National Perspective Plan comprises two components: Himalayan Rivers Development and Peninsular Rivers Development. The Government of India formed a Task Force under the Presidency of Suresh Pravu, leader of Rashtriya Swayamsevak Sangh (RSS). The said Task Force has an official

[21] *Ibid,* Article IV.
[22] *Ibid,* Article IX

time frame, which ends in 2016, to implement the Project. In the meantime, the Supreme Court of India directed the Government to complete the project by 2012. [23]

The National Water Development Authority (NWDA) of India describes plans for linking Indian Rivers, and states that the proposals essentially comprise three major links: *Southern Water Grid - interlinking Mahanadi, Godavari, Pennar, Cauvery and Vaigai in Peninsular India, Interlinking of Brahmaputra with Ganga, Subernarekha and Mahanadi and Interlinking Gandak, Ghaghara, Sarda and Yamuna to Rajasthan and Sabarmati.* The last two of these three links affect Bangladesh, as they would withdraw water from the Ganges-Brahmaputra-Meghna (GBM) river system, which is shared by five counties, Bangladesh, Bhutan, China, India and Nepal. The NWDA separates the GBM into three river systems, labeling the *Brahmaputra* basin one of water surplus and the Ganges as one of marginal surplus and the *Meghna* (*Barak*) is not categorized. [24]

1.2.1. Possible effects of withdraw water from the major rivers

The people of Bangladesh already are facing the dreadful experience of the unilateral withdrawal of water from the Ganges river that led to desertification of the northern Bangladesh and loss of unique biodiversity. The diversion of Ganges waters by India and the resulting decrease in flow through Bangladesh has disrupted fishing and navigation, brought unwanted salt deposits into rich farming soil, adversely affected agricultural and industrial production, changed the hydraulic character of the rivers, and brought about changes in the ecology of the Delta. [25] Moreover, Indian proposed river-linking project that supposes to reduce the flow of the Bangladesh's

[23] Writ Petition (Civil) No. 512/2002, "In Re: Networking of Rivers", October 31, 2002, Supreme Court of India.
[24] J. S. A. Brichieri-Colombi, *Could Bangladesh Benefit from the River-linking Project*? 2003.

two major riverine networks, namely the *Jamuna-Brahmaputra* and the *Ganges-Padma* and therefore would affect all over the Bangladesh. However, Scientists, scholars, policy-makers and interested observers generally believe that the possible effects of withdrawal of water from major rivers can be as follows:

The reduction of flow in *Atrai, Karatoya* and *Teesta* (all distributaries of *Brahaputra*) could spell disaster for the rainfall-deficient Northwestern hydrologic region. Wetland and groundwater recharge capacity would also decrease in the *Brahmaputra* Dependent Area. Moreover, the decrease in the flow of Brahmaputra (*Jamuna*) within Bangladesh would adversely affect the flow of the distributaries in the North-Central hydrologic region. The amount of *Jamuna* water reaching the *Ganges* at *Goalundo* would also diminish, adversely affecting the distributaries of the South-Central hydrologic region. Coastal erosion and saline water intrusion; i.e. upstream water diversion in Bangladesh includes saline ingress through the lower *Meghna*, extending as far as the *haor* basin of Sylhet (northeast Bangladesh).[26] Such diversion of water will minimize the flow of water to the *Sunderbans* (the world largest mangrove forest) a world heritage site shared by the India and Bangladesh and thus culminate into its possible decay.

The proposed withdrawal of water flow at the upper riparian will have serious harmful effect on the climate, ecology, geomorphology, bio-diversity of Bangladesh. Unknown ecological disaster, as we have very small scientific knowledge on tropical rivers and consequences due to plate movement (seismic activities) also poses great risk. India's search for irrigation water can dry out great areas in Bangladesh for much

[25] Syed Abdus Sonhan, Swapan Kumar Das, M.A. Salam Skikdar, *An overview of the Impact of the Farakka Barrage on the Gori River and its Offtake*, Regional Seminer on Conflict Management of international River Basins, Dhaka, 1999.

of the year and affect more than 80% of Bangladesh's 20 million small farmers who grow rice and depend on water that has flow through India. Also the drying up of rivers will lead to intrusion of salinity into farming areas. Dramatic decrease of fish would affect the large number of fishermen in Bangladesh A project that is feared to affect 130 million people of Bangladesh, directly or indirectly, may also lead to political instability in the region.

1.2.2. River-linking project and the Ganges Water treaty

Though planners of the Treaty did not have the river-joining project in mind, the Treaty does have implications on the project. Para 3 of the Preamble of the Ganges Treaty has registered their willingness to share, by mutual agreement, the waters of the international rivers and of making the optimum utilization of the water resources of their regions for the mutual benefit of the peoples of the two countries. This pledge has been reinforced in Article IX of the Treaty according to which "Guided by the principles of equity, fairness and no harm to either party both the Governments agree to conclude water sharing Treaties/ Agreements with regard to other common rivers". Moreover, from a water sharing perspective, the Project again violates the Treaty as it is intended to divert water from the Ganges before the water reaches the Farakka point where the water share is measured now.[27] However, considering the environmental and economic dimensions of the RLP, it is therefore expected that India would immediately consult with its neighboring countries about planned measures, particularly with Bangladesh in accordance with Treaty provisions those call for optimum utilization of the water resources for the mutual benefit.

[26] Bangladesh has two sites designated as wetland of international importance, with a surface area of 611200 hectors include Tanggoar haor and Sudarbans reserve forest, the annotated Ramsar *list of Wetlands of international importance, available at http://www.ramsar.org/profile/profiles_bangladesh.htp*

[27] Article II, of the Ganges Treaty.

In sum, to take into account the disputed issues and adverse impacts, conflict resolution and sustainable management of common rivers between India and Bangladesh requires further cooperation and extended treaty provisions. Existing Ganges Treaty does not obligate the parties to take preventive measures in relation to planned measures which may have a significant adverse effect upon other watercourse States. To protect and preserve environment and ecosystem of international watercourse it needs to incorporate provisions regarding prior consultation and notification accompanied by available technical data and information, including the results of environmental impact assessment. Ganges Treaty provides provisions for exchange of information and consultation is limited on water flows at and below Farakka point for operation of sharing arrangement of Ganges water. But watercourse states need to exchange data and information on the condition of the watercourse, in particular that of a hydrological, meteorological, hydrogeological and ecological nature and related to the water quality as well as related forecasts. Therefore it necessitates framing an effective institutional arrangements and JRC seems inadequate in this regard. Moreover, the real dispute settlement power, in the absence of any body with judicial capacity, is given to the political authority of the two countries which again, as we have seen, are unlikely to come up with real solutions acceptable to both the countries, considering the huge difference in the countries' bargaining power.

However, considering the existing circumstances for finding a comprehensive solution to these disputes it is important to take recourse of the international laws and regulations to comply with international responsibility to ensure equitable share of water between India and Bangladesh. The World Commission on Dams, in its Report of 2000, observed that large dams and diversion projects can lead to the loss of forests

and wildlife habitat, aquatic biodiversity and can affect downstream floodplains, wetlands, riverines, estuarine and adjacent marine ecosystem.[28] The Commission therefore, underscored the necessity of "identifying the legitimate claims and entitlement" that are involved in such projects.[29] Therefore next chapter deals with international laws, principles and instruments to establish the legitimate claim of Bangladesh over India for equitable share of water of international rivers.

Chapter Two

The problems related to transboundary water resource management in light of the conflicting interests of upstream and downstream states require the response of international law. International law regulates water among the other reasons due to the inter-state character of international river basins and to the extent that the hydrological cycle internationalizes national water resources, causing transboundary effects. Norms, principles and rules of international law concerning transboundary effects centre mainly on how to reconcile the conflicting interests of the concerned states in order to reach an equitable solution and provide further guidelines for sustainable water resource management and development. Ganges water sharing disputes and RLP concerned the international rivers those flow to Bangladesh from India. Therefore this chapter would analysis the existing and emerging international law and principles relevant to transboundary water and its ability to contribute to the peaceful resolution for preventing and mitigating conflicts and cooperation for sustainable management of international watercourses. The overall assessment would guide to justify the claim of Bangladesh on equitable share of the transboundary water resources with India.

[28] World Commission on Dams, (2000), *Dams and Development, A New Framework for Decision-Making, the Report of the World Commission on Dams*, 2000, Executive Summary, Pp. 33.
[29] *Ibid.*

2.1. Water as a human right: shared water resources

The right to water would provide a means for people to claim access to water for their basic needs. Moreover, through recognition of water as a human right and endow with effect to this right international community could enhance their efforts to satisfy the basic human needs and to meet the Millennium Development Goals (MDGs).[30] World Summit on Sustainable Development (WSSD) held in Johannesburg 2000 identified key role of water in agriculture, energy, health, bio-diversity, and ecosystem as well as in combating poverty. The needs of the poor and of future generations must be secured and issues of quantity and quality of water must be addressed".[31] From the perspective of water quantity and quality issues, diversion of flow of rivers and pollution of watercourses can pose a possible threat to existing ecosystems. So it is important to outline how the right to water has been defined and addressed from the perspectives of human rights from the aspects of right based and ecosystem approach.

2.1.1 Right based approach:

A right to water is not explicitly recognized as a human right in the international human rights instruments but the existence of a human right to water is found under customary international law, since uniform State practice may provide evidence of *opinion juris*. The Indian jurisprudence is most notable for extending human rights to include water issues. Indian courts have acknowledged that the right to life includes a

[30] The millennium Development Goals (MDGs) are eight goals to be achieved by 2015 that respond to the world's main development challenges. Millennium Declaration that was adopted by 189 nations and signed by 147 heads of state and governments during the UN Millennium Summit in September 2000

[31] Serageldin, *Rivers of the World Mismanaged, Polluted, Environment News Service*, 29 November 1999. Available at: http:ens.lycos.com/ens/nov00/1999L-11-29-03.html.

right of access to water, expanding the right to life as expressed in Article 21 of the Fundamental Rights chapter of the Constitution to include the right to potable water.[32]

It is worthy to mention here that South African Bill of Rights includes a human right to water. Moreover, development of environmental law has created an additional significance to recognize the right to water.

However, human rights treaties and especially the right to an adequate standard of living can be argued to imply a human right to water. Among the UN human rights treaty bodies, it is the Committee on Economic, Social and Cultural Rights which has given the most elaborate definition of the right to water. The Committee derives this right from articles 11 and 12 of the International Covenant on Economic, Social and Cultural Rights, dealing respectively with the right to an adequate standard of living and the right to the highest attainable standard of physical and mental health. In its General Comment No.15 of 2002,[33] the Committee defines the right to water as the right of everyone "to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses." The Comment is undoubtedly an authoritative statement and assessment of the status of international law although not legally binding on its own merits.[34]

The right to water is an essential element of human dignity.[35] The first paragraph of the aforesaid Comment No. 15 states that: Water is a limited natural resource and a public good fundamental for life and health. The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the

[32] Attakoya Thangal v. Union of India 1990 (1) KLT 580.
[33] United Nations Committee on Economic, Social and Cultural Rights, *General Comment 15 (The Right to Water)*, UN Doc. E/C.12/2002/11. Available at: www.ohchr.org/english/bodies/cescr/comments.htm)
[34] See ILA Committee on International Human Rights Law and Practice (2004) for an elaborate analysis of the legal status of UN Committee documents.
[35] *Céline DUBREUIL*, The Right to Water: From concept to implementation, available at

realization of other human rights. However, the explicit recognition by the international community right to water would underline its importance for human dignity. Moreover, acknowledging a human right to water would help focus conclusion to resolve conflicts over the use of shared watercourses.[36]

2.1.2. Ecosystem Approach: River basin and ground water

The term "right to water" does not only refer to the rights of people but also to the needs of the environment with regard to river basins, lakes, aquifers, oceans and ecosystems surrounding watercourses.[37] Development of principles and laws regarding environment extended the notion of right to water and without this broader respect a right to water can not be secured. Water and water resources are vital elements for the development and access to water to be consistent with the aim of sustainable development that call to meet the basic human needs and to protect environment and ecology. Therefore, without consideration of environment and ecology the right based approach can not be ensured and needs to be supplemented by ecosystem approach.

However, the human rights perspective only indirectly addresses issues such as access to water for agriculture and food production but to ensure adequate access to good quality water to be achieved beyond the provision of safe drinking water and sanitation. Water quality and quantity requirements demand the sustainable management of transboundary water and water resource and protection of water ecosystems from pollution. Access to safe and sufficient water as a basic human right, and the consequent duty on government to provide basic water supply for its

http://www.worldwatercouncil.org/fileadmin/wwc/Library/RightToWater_FinalText_Cover.pdf

[36] Scanlon, Cassar and Nemes, *Water as a Human right?* IUCN Environmental Policy and law Paper No.51, (2004), Pp. 23., Available at: www.iucn.org/bookstore

populations will enable its consideration within such an allocation framework, i.e. minimum water requirements have to be agreed among co-basin states.

We need to make certain that river basins and groundwater are managed in their entirety. Thus steps need to be taken to make provision for environmental flows for healthy river systems, i.e. to maintain downstream ecosystem and their benefit.[38] The human right to water would not only mean the expansion of existing human rights and duties in the context of achieving access to water by all, but also an acknowledgement that healthy, functioning river system and ground waters are essential for people, plants and animals. However, Ganges water sharing dispute, concerns both water quantity and water quality issue related to water flow and pollution, which are normally interconnected in relation to harm caused to freshwater resource and goes against the right based and ecosystem approach of right to water.

2.1.3 Water quality issue

International law has dealt extensively on the water pollution issues calling for the prevention, reduction and control of pollution. Article 21.1 of the Watercourses Convention,[39] states: 'pollution of an international watercourse' means any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct. Article 10 of the Helsinki Rules 1996[40] provided that states should consider all reasonable measures and endeavor to minimize water pollution in an international drainage basin such that

[37] *Ibid*

[38] Dyson, Bergkamp, Scanlon, -Flow: the Essential of Environmental Flows, IUCN, Gland, Switzerland, 2003, Pp, 93, Available at : www.iucn.org/bookstore

[39] UN Convention on the Law of the Non-Navigational Uses of International Watercourses, New York, 21 May 1997, *UN Doc.* A/ 51/ 869, and 36 *ILM* (1997), 719.

[40] The Helsinki Rules on the Uses of the Waters of International Rivers (1966 Helsinki Rules) adopted by the ILA at the fifty-second conference, Helsinki, August 1966.

"substantial damage" is not caused to the territory of states contiguous to the drainage basin.

At the domestic level jurisprudence has developed on water pollution is praiseworthy. The Supreme Court of India ordered the government to improve its sewage system and to ensure that the practice of throwing burnt corpses into the river was stopped. The Court emphasized that due to the "grave consequences of the pollution of water and air", the "need for protecting and improving the natural environment…is considered to be one of the fundamental duties under the Constitution (vide clause (g) Art. 51a of the Indian Constitution.[41]

The same issue of river pollution was challenged before the Supreme Court of Bangladesh by the Bangladesh Environmental Lawyers Association (BELA)[42], pleaded that the ecological system of the country more particularly the air and water including the major rivers (*Buriganga, Surma, Karnaphuli* and so on) are being severely affected by 903 identified industries and that no affirmative action has been taken by the responsible administrative agencies. The court stated that, that 'It will be imperative on the part of the Director General, Department of Environment, to take penal action against such department for persons who are responsible for not implementing the letter of the Environment Conservation Act, 1995.'[43]

In our present case, the *Ganges* is one of the world's most polluted rivers due to discharging untreated sewage of 114 cities of India. The Ganges' tributary, Yamuna, alone drains 200 million liters of sewage and 20 million liters of industrial waste from

[41] The *M.C. Mehta v. Union of India and Others Case* (1988) concerned the problem of pollution of the Ganga by the Kanpur Municipal Council and the duty of the government, under Art. 21 to ensure pollution free river water.
[42] Bangladesh Environmental lawyers Association (BELA), a Non-governmental organization, initiated first public interest litigation in Bangladesh and Court accepted its *standing and court stated that an aggrieved person need not to be affected directly.*
[43] *Dr. Mohiuddin Farooque v. Bangladesh & Others.*(Writ Petition No. 891/1994, HCD).

Delhi to the mainstream.[44] The poor water quality correlates with the occurrence of waterborne diseases such as hepatitis, amebic dysentery, typhoid, and cholera.[45] Moreover, due to arsenic contamination surface water is also, important for the drinking purpose of the people of Bangladesh. It is alarming for the Bangladesh that the ground water is contaminated by arsenic in 59 out of the country's 64 districts and estimated 24 million people are affected due to waterborne diseases. Therefore to face this catastrophic disaster of ground water contamination, the expert's suggestions to reduce *arsenicosis* immediately include reverting to untreated surface water and to develop safe and reliable surface water sources including river water.[46]

However access to water can be protected by human rights approach by providing people with actual control over water and qualifying state sovereignty by duties. Although where countries share a water resource, the right to water has limited new consequences for international law on trans-boundary water resources, states already have obligations of greater scope under international customary law, which stipulate that each country's rights to use trans-boundary waters should be determined on the basis of the principles of equitable use and no significant harm to other countries. In this regard related water laws and principles is subject of analysis further.

2.2. The International Legal Regime: Transboundary Water Conflict and Shared Resources

The international water law developed throughout the last few decades in response to transboundary water conflicts between the basin-States expressed concern

[44] Supra note 41.
[45] Alam, Khorshed, *Cleanup of the Buriganga River:bintegrating the environment into decision making.* Ph.D Dissertation. Perth, Murdoch University, available at: http://wwwlib.murdoch.edu.au/adt/pubfiles/adt-MU20040820.120416/08Chapter7.pdf

for the whole world. Basically the international law, evolved through state practices and customs eventually developed into the principles of customary international law, moves from a purely national level in its origin to a transnational dimension and then to a properly international level.

In the domestic legal system, the principle of "equitable apportionment" evolved as the primary rule that defined and balanced the competing claims of subnational actors.[47] At the international level, the principle of "reasonable and equitable utilisation" crystallised as a rule of customary international law derived, in part, from national (inter-State) and international judicial practice, and supported by treaty law. However, the decisions of domestic and international courts or tribunals and bilateral, regional and multilateral agreements in relation to transboundary Rivers contributed to develop a general and customary international law of a comprehensive suite of rules, principles and legal concepts requiring enhanced protection of various aspects of international watercourses. Hence those are discussed to justify the claim of equitable share of the transboundary water resources of Bangladesh over India.

2.2.1. Principles of International Water Law

While the UN Convention is not in force yet, international water law in general contains customs and principles of international law, which have been developed by the work of international judicial bodies and scholars throughout the time. Since there is no authoritative set of rules to manage the transboundary water resources, these principles is likely to continue to play a significant residual role in the settlement of international environmental disputes concerning shared water resources. Thus this

[46] *Ibid*
[47] The US Supreme Court first applied equitable apportionment in *Kansas v. Colorado*, 206 U.S. 46, 1907

section analyzes the substantive content and the normative status of these principles in international law.

Principle of Absolute Territorial Sovereignty and Absolute Territorial Integrity

A sovereign state has jurisdiction over its territory, including land, air space above the land and territorial waters. States have the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies. A sovereign state has jurisdiction over its territory and right to exploit its own resources that gives that country an effective control over its freshwater resources but subject to some qualifications reflected in the principle of limited territorial sovereignty. For example, unilateral withdraw of Ganges water by India led to cause harm on Bangladesh hence it is subject to qualification in accordance with the principle of limited territorial sovereignty.

The principle of absolute territorial sovereignty is often said to have the same properties as the infamous "Harmon Doctrine"[48] that a state is totally free to act in whatever way it likes within its own territory. The principle has been effectively abandoned by international judicial bodies, such as in *Trail Smelter* Arbitration 1941[49], in 1949 by the ICJ in the *Corfu Channel* case.[50] Particularly relevant in this regard is the *Lake Lanoux Arbitration*,[51] where France wanted to divert a watercourse of Lake Lanoux for hydroelectric purposes. Lake Lanoux feeds the Carol River which flows across the border from France to Spain. The Court noted that conflicting

[48] The opinion given by the Attorney General of the United States, Mr. Judson Harmon, in1895 regarding a dispute with Mexico over the utilization of the waters of the Rio Grande concluded that there was no settled and recognized right "by which it could be held that the diversion of the waters of an international boundary stream for the purpose of irrigating lands on one side of the boundary and which would have the effect to deprive lands on the other side of the boundary of water for irrigation purposes would be a violation of any established principle of international law". See 21 Op. Att'y Gen. 274, at 283 (1895).
[49] Trial Smelter Arbitration (U.S. v. Canada) 1941, ii March, 1941, 3 R.I.A.A. (1905)
[50] *Corfu Channel* case, (U.K. V. \ALB. 1949 ICJ 4 (Judgement, merits, 9 April 1949);
[51] Lake Lanoux Arbitration (France v. Spain), 24 I.L.R. 101 (Arbitral Tribunal 1957)

interests must be reconciled through negotiation and mutual concession. Moreover, the ICJ stated that, the riparian States are obliged to consider the rights and interests of lower riparian states.

The counter to absolute territorial sovereignty and equally extreme, is absolute territorial integrity. This principle says that lower riparian states have the right to the continuous or natural flow of a river flowing from upper riparian states. This principle also is subject to qualifications in accordance with the limited territorial integrity. In the context of Indo-Nepal water relations, India objected to several Nepalese irrigation and hydropower projects, i.e., the *Sikta, West Rapti* (*Bhalubang-Deokhuri*), *Kankai, Babai,* and *Tamur* hydropower projects, stating that these works would violate the principle of territorial integrity.[52] But Nepal as an upper riparians of India is allowed to utilize the resource in such a manner as not to affect the natural flow of the river in to the lower riparians of India. However,

The absolute form of no-harm principle would be similar to absolute territorial sovereignty and absolute territorial integrity, and as allowing states to cause serious or irreversible harm beyond their territory would be an application of absolute territorial sovereignty. Moreover, an obligation of a state to cause absolutely no harm beyond its territory would be an unworkable application of absolute territorial territory. The necessary balance is reflected in the qualification "significant" harm, which is discussed following the no harm principle.

Obligation Not to Cause Appreciable Harm

The principle of the obligation not to cause appreciable harm, compels states not to use, or to allow the use of, their territory for acts contrary to the rights of other

states. This principle can be regarded as an expression of principles of good neighborliness or as *sic utere tuo ut alienum non laedas* and firmly embedded within international law. In the *Chorzow Factory* case, the PCIJ stated that: 'It is a principle of international law, and even a general conception of law, that any breach of an engagement involves an obligation to make reparation.'[53] Moreover, In the *Corfu Channel case,* the ICJ provided that 'it is every state's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other states. In the Lake *Lanoux Arbitration, it held that*: 'interdiction prohibiting a state upstream to alter the water of a river in such condition as to cause substantial damage to the downstream states.'

In the *Trail Smelter Arbitration* court stated that 'under the principle of international law as well as the law of the United States, no state has the right to use or permit to use its territory when the case is of serious consequences and the injury is established by clear and convincing evidence'.[54] Notably, although the case pertained to the release of noxious air pollutants, it is quite likely that the tribunal would have come to a similar conclusion were the injury effected through other forms of pollution, such as water contamination.[55] This is consistent with the ICJ Advisory Opinion on the *Legality of the Threat of Use of Nuclear Weapons* case. In that case, the ICJ held that 'The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States

[52] Dr. Trilochan Upreti, *International Watercourses Law and Its Application in South Asia,* Pairavi Prakashan. 2006, P. 103.
[53] Case Concerning The Factory at Chorzow , PCIJ Ser. A, No. 17 (1928)
[54] Trial Smelter Arbitration (U.S. v. Canada) 1941, ii March, 1941, 3 R.I.A.A. (1905)
[55] Supra note, 2, Pp. 10

or of areas beyond national control is part of the corpus of customary international law relating to the environment'. [56]

Within international instruments, the no-harm principle can be found as well. Under the Watercourses Convention, parties are obliged to prevent the causing of significant harm and to take actions whenever such harm is nonetheless caused. [57] The no-harm principle is further emphasized by Principle 21 of the Stockholm Declaration and Principle 2 of the Rio Declaration, limiting the sovereign right of a state to exploit their own resources, pursuant to their own environmental and developmental policies, by the condition that no harm must be caused beyond their jurisdiction. When considering whether one state's action causes, or will cause, harm to the territory of another, the obligation not to cause significant harm is one of due carefulness as formulated in the Watercourses conventions, where as the Draft Articles referred to "appreciable" harm[58] and The Helsinki Rules apply to "substantial" pollution.[59] A majority of international instruments and publicists suggest that the harm must be "appreciable" or "substantial" before international water law may be invoked. For an injury to rise to the level of "appreciable" or "substantial" harm, the injury must have significant and consequential effects upon public health, economic productivity, or the environment of another state.[60]

Principle of Reasonable and Equitable Utilization

The principle of equitable and reasonable utilization is considered the main principle of international water law as it governs the attribution of shared water resources of international watercourses. This principle developed through the judicial

[56] ICJ Advisory Opinion on the Legality of the Threat of Use of Nuclear Weapons in Armed Conflicts, Para. 29.
[57] Article 7 of the Water Convention.
[58] Report of the International Law Commission on the Work of its Forty-Sixth Session, *UN Doc*. A/49/10 (1994), p. 236.

practices, as the equitable apportionment rule, first articulated in the U.S. by the Supreme Court in 1907.[61] The rule of "reasonable and equitable utilization" in international legal discourse began to appear more prominently in the 1960's. At the time of the Columbia River controversy, important declarations by nongovernmental organizations, made up of international legal experts, had identified reasonable and equitable utilization as the legal rule governing the uses of international drainage basins. The Water Conference at Mar del Plata[62] recommended that nations should properly appraise the rights and interests of other states sharing a common resource, when considering ways to exploit the resource within their territory, whereby the beneficial use of the resource is shared equitably among the states. The 1997 UN Watercourses Convention, adopted by the United Nations General Assembly, contains provisions for the reasonable and equitable utilization of an international watercourse as its principal norm.

Equitable and reasonable utilization and the no-harm principle are often viewed as conflicting and competing principles and require determining the factors to be considered within the frame of *Reasonable and Equitable Utilization* of international watercourses**.** The 1966 International Law Association's (ILA) Helsinki Rules, adopted after the conclusion of the Columbia River Treaty, provides a list of factors used to determine the reasonable and equitable share of an international watercourse. Article V (3) of the Helsinki Rules provides that, "In determining what is a reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole." This principle has been codified in Article 5 of the

[59] Article X of the 1966 ILA Helsinki Rules.
[60] *Ibid*
[61] The US Supreme Court first applied equitable apportionment in *Kansas v. Colorado*, 206 U.S. 46, 1907
[62] The United Nations Water Conference, Mar del Plata, 14-25 March 1977.

Watercourses Convention[63], and Article 6 included the factors relevant to equitable and reasonable utilisation.[64]

Principle of the Community of Interests

The increasing significance of non-state actors is replicated in a move away from state interests toward common interests. Common interests transcend traditional international law and are reflected in the concept of community of interests. The mention of community interest is made in the classical Roman law as well. Founded on the principles of "natural law," it ignores all national boundaries and regards the entire hydrologically connected water system as a single economic and geographic unit.[65] However, there is no explicit reference to community of interests in relevant international instruments but one can locate the principle in shared resources management arrangements. At the regional level, the Protocol on Shared Watercourse Systems in the Southern African Development Community (SADC Protocol), Article 2.2 obliges the member states to respect and abide by the principle of community of interests in the equitable utilization of shared watercourse resources.[66]

The principle of community of interests was confirmed between riparian states in the 1929 *River Oder* case,[67] in which the PCIJ stated that the community of interest in a navigable river becomes the basis of a common legal right, the essential features of which are the perfect equality of all riparian States in the use of the whole course of the river and the exclusion of any preferential privilege of any one riparian State in

[63] Article 5 of the Water Convention.
[64] *Ibid,* Article 6 of the Convention, "Factors relevant to equitable and reasonable utilisation:"
[65] Supra note, 2 Pp.4.
[66] Protocol on Shared Watercourse Systems in the Southern African Development Community Region, 28 August 1995, entered into force 29 September 1998.
[67] The territorial competence of the River Oder Commission, 1929, PCIJ Series A No. 23, pp. 27-28.

relation to the others. The ICJ in the *Gabcíkovo-Nagymaros* case stated that modern development of international law has strengthened this principle for non-navigational uses of international watercourses by the adoption of the Convention of the Law of the Non-navigational Uses of International Watercourses. Therefore, the community of interest principle is the basis for reasonable and equitable utilization that pressed on the goal of the most optimal use and development of a transboundary water resource system.

In the light of discussed above principles of water law trend shows that upstream riparians promoted the theory of absolute territorial sovereignty, whether downstream riparians have claimed absolute territorial integrity. However, either theory has received much support from legal writers or international tribunals, who tend to prefer the principle of equitable and reasonable utilization. The principle of equitable utilization is found in the doctrine of limited territorial sovereignty and integrity. Under this principle, a basin state's sovereign rights to the waters of international rivers within or adjoining its territory are limited by the corresponding sovereign rights of other basin riparians. A state may thus utilize the water to the extent that this use does not interfere with the reasonable utilization of other basin states.

Nonetheless, the reasonable and equitable use of property and territory cause some forms of harm may be considered per se unreasonable as reflecting an obligation as to act based on standards of due diligence rather than an absolute obligation as to result.[68] Thus equitable and reasonable utilization and the no-harm principle are often viewed as conflicting and competing principles.[69] But there are

[68] A. E. Boyle, *State Responsibility and International Liability for Injurious Consequence of Acts Not Prohibited by international,* 1990, 39 International and Comparative Law Quarterly 1.
[69] ILC Summary Records of the Meetings of the Forty sixth Session,

important factors are to be considered by the upstream riparians under standard of due diligence to qualify the reasonable utilization of water of an international river. Since over exploitation of fresh water is often referred to as the main reason for considering the principle of equitable and reasonable use as more suitable for regulating water allocation, therefore the principle of equitable and reasonable utilization and the no-harm principle supplement one another.[70]

So, the factors those qualify the principle of equitable and reasonable utilization requires to examine further to advance a plausible international claim against the unilateral diversion of waters of international rivers. Article 6.1 of the UN water Convention, Article V (2) of the Helsinki Rules, both emphasize relevant factors for consideration may include, *inter alia*: geographic, hydrologic, hydrographic, climatic and ecological circumstances, population dependent on the watercourse, prior, existing, and potential uses of the waters; social and economic needs of each state; feasibility of alternatives to the proposed project; and compensation of one state as a means for resolving conflicts. Therefore taking into account the adverse impacts of Farrakka Barrage and possible effects of RLP are analyzed further in the line with qualifying factors to determine the balance of interests between India and Bangladesh.

Bangladesh perspectives

The Ganges River begins in the central Himalayas and flows through Bangladesh (known as the Ganges- Padma River in Bangladesh) to the Bay of Bengal. Four-fifths of Bangladesh, is straddled by this delta system and nearly 35 million people in about one-third of the total area of Bangladesh are directly dependent upon

[70] Tanzi, A. and M. Arcari *The United Nations Convention on the Law of International Watercourses*, Kluwer Law International: London, 2001.

the Ganges for the ir livelihood.[71] The economic impacts of the reduced river flow are significant. Approximately half of the country's GDP is based on agriculture, and hence these rivers irrigation value is vital to the economy of Bangladesh and over its 130 million inhabitants. According to the Bangladeshi section of the Joint River Commission, the consolidated financial losses of Bangladesh due to India's water withdrawal from 1976 to 1993 amounts to nearly $3 billion (in 1991 dollars), with the greatest losses suffered in the fisheries and agricultural sectors. Moreover, the largest natural mangrove forest in South Asia, the Sundarbans, is losing millions worth of timber every year (in the period of '75-95 is estimated about $320 millions). [72] Moreover, it is precious to mention that recent (15 October, 2007) hurricane called *Sider* came in from the Bay of Bengal caused death is about 3285 people of the costal zone of Bangladesh. It is said that, in the *Sundarbans* thick growth of mangrove trees successfully reduced the impacts of the hurricane as it came at a speed of 200 km per hour (The Daily Star, November 20, 2007).

Upstream Ganges tributaries discharge sediments into the Southeast area of Bangladesh and flooded periodically by saline water cause harm for *sweet water fishery, agriculture and lead to* extinct of *Sunderbans* (Flora and Fauna), the world's largest mangrove forest.[73] Moreover, intrusion of salinity, discharging sediments, reduction of water flow and ecological adversity cause incidents of natural disasters like flood, drought and cyclone very often in Bangladesh. During the period of 1976-93) estimated that the increased salinity caused industrial loss to be $37 million.[74] In

[71] Swain, A., "Displacing the Conflict: Environmental Destruction in Bangladesh and Ethnic Conflict in India", Journal of Peace Research, Vol. 33, No. 2, 1996, pp. 189-204.
[72] Ansarul Karim, *Implications on Ecosystem in Bangladesh*, in The Ganges Water Diversion: Environmental Effects and Implications, edited by N. Monurul Kuder Mirza , Kluwer Academic Publishers, 2004, Pp. 99
[73] M.A. Allison, E.B. Kepple, *Modern Sediment to the Lower delta of Plain of Ganges-Brahmaputra River in Bangladesh,* Geo-Marine Letters, Volume 21, Number 2 / September, 2001, Pp. 72,
[74] Supra note, 72, Pp.101

addition, there have been increased health problems due to the decreased availability of fresh water. However, since one-third of the total area of Bangladesh is affected due to *Farrakka* Barrage and if India implements proposed river-linking project that supposes to reduce flow from all other rivers of Bangladeshand it is easily predictable the adverse impacts (First chapter discussed on possible impacts in details) of the project.

Indian Perspectives

India constructed Farakka Barrage with a view to diverse the Ganges water to keep Calcutta harbor operational during the dry season. Ganges distributaries have undergone siltation in historical times which in the Hooghly and Bhagirathi rivers in India. Annually, the Ganges brings to its mouth over 2 million tons of silt and due to increasing deforestation in the foothills of the Himalayans, the amount of erosion is growing. With such levels of silt, it is increasingly no longer possible for the Hooghly to retain a flushing role for Calcutta Harbor. In addition, due to silt deposition and flooding patterns, the Ganges is actually naturally shifting eastward, and it is only a question of time before the Hooghly River will no longer be capable of supporting deep harbor operations. [75] However, this is the time for India to realize these realties and think for alternatives. Concentrate on port development further downstream. India should accept this fact and plan for a harbor much closer to the Bay of Bengal.

The Indian Supreme Court which ordered to implement the project reasons took into account includes relief to the drought prone areas, effective flood control measure, and a form of water harvesting. But the possible ecological impacts should be considered which would prove disastrous not only to the fishery, but also to the biodiversity and biotic processes of this region that have evolved over the past

hundred of millions of years. This is quite a weird understanding of water harvesting.[76] There are number of alternatives are available to meet the water scarce in India, such as the 383 on going projects as per Indian Planning Commission's Tenth Plan document.[77] Before the implementation of any planned measures that may have adverse effects, timely notification is required by the Watercourses Convention, accompanied by data and information, including those resulting from environmental impact assessments.[78]

However, the views of the judicial and arbitral statements, regional and international instruments and from the academic commentators discussed previously facilitate to draw conclusion that the water diversion of Ganges for industrial use and domestic use of waters of other common rivers through implementing proposed project do not meet the required qualifications to be considered as equitable and reasonable utilization. Since the conflict of interest between domestic industrial use of International River and basic human need, life and livelihood of present and the future generation definitely balances for the latter one. Existence of viable alternative means for both the cases, further strengthen the legitimate claim of Bangladesh in violation of equitable and reasonable utilization of common river's waters. Nevertheless, the next section discusses the rules and principles on transboundary water resource management which are set out in the provisions of the 1997 UN Convention and some other relevant instruments, those would support further to establish legal arguments in favor of Bangladesh.

[75] Huda, A.T.M. *Constrains and Opportunities for Cooperation towards Development of the Ganges Basin*, 2001.
[76] Gopal Krishna, *Status of Writ Petition on "Networking of Rivers" in India*, available at: internet
[77] *Ibid*
[78] Article 12 of Water Convention.

2.2.2. The international Legal Instruments

The Convention on the Law of the Non-Navigational Uses of International Watercourses, 1997 (Herewith Water Convention)[79] codified and formalized the established and emerging substantive and procedural international rules and principles of customary international law and further strengthened and legitimized such rules and principles. Moreover, some other international instruments including the Helsinki Rules, 1966 (Herewith Hesinki Rules),[80] the Convention on the Protection and Use of Transboundary Watercourses and International Lakes 1992 (Herewith ECE Convention), [81] and the Berlin Rules on Water Resources, 2004 (Herewith Berlin Rules)[82] played important role by the way. International water law also includes many regional and bilateral treaties that regulate various uses of surface and underground water resources, from the aspect of universal aspirations and relevancy of the subject matter of the study 1997 UN Convention and The Berlin Rules 2004 are discussed below.

1997 UN Convention

The UN Watercourses Convention, adopted in May 1997, and ratified to date by sixty Parties, has yet to enter into force.[83] Although a convincing majority of states voted in favor of the adoption of the Watercourses Convention, the slow rate of ratification at present indicates that it is doubtful whether the Convention will enter into force. It is noteworthy to mention here that, Bangladesh is signatory to the Watercourses Convention but India has yet to sign. This is a global framework

[79] Supra note 39.
[80] Supra note 40.
[81] Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki, 17 March 1992, entry into force: 6 October 1996, 31 *ILM* (1992), 1312, and *UN Doc.* ENVWA-R.53.
[82] The Berlin Rules on Water Resources (Berlin Rules), adopted at the ILA seventy-first conference, Berlin, August 2004, through Resolution No. 2/2004.

agreement with the goal to 'ensure the utilisation, development, conservation, management and protection of international watercourses and the promotion of their optimal and sustainable utilisation for present and future generations'.[84] Moreover the Convention obliges that "an international watercourse shall be used and developed by watercourse States with a view to attaining optimal and sustainable utilisation thereof and benefits there from, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse".[85]

The Berlin Rules 2004

The Berlin Rules seems to integrate the whole of established and progressively developing international water law and promises to be of great use to modern water management.[86] The Rules deal not only with waters of international drainage basins, but also with waters entirely within a state. It includes principles of international law applicable to the management of all waters, internationally shared waters, the rights of persons, protection of the aquatic environments, groundwater, navigation, protection of waters and water installations during war or armed conflict, and state responsibility. It is worth remembering here that like its predecessor,[87] the Helsinki Rules 1966, the Berlin Rules 2004 does not have any political endorsement backing it. But at the same time the preface of the set of articles enunciate that it is nothing but an amalgamation of customary international law in the area, some of rules and principles are just less well established than the others. While we still await the enforcement of the first UN Convention in watercourses management, the Berlin Rules 2004 would provide with necessary aid in interpreting and understanding it.

[83] 35 instruments of ratification, acceptance, approval or accession are needed for the convention to enter into force, Article 36 of the Watercourses Convention.
[84] Preambular paragraph 5, Water Convention.
[85] Art. 5 of the Water Convention.
[86] Preface, Berlin Rules 2004.
[87] I LA Berlin Conference, August 21, 2004.2004.

2.2.3. An Overview of UN Convention and Berlin Rules

Substantive rules and shared water resources

Both the Berlin Rules and the UN Convention used equitable utilization as the main guiding principle in the sharing of waters of international watercourses, though the Berlin Rules merged the "no harm" principle with it.[88] Article 5 of the Water Convention provides the cornerstone principle, "equitable and reasonable utilisation". The determination of what is equitable and reasonable will constitute the basis of the overall solution and should be applicable case by case based on the assessment of the State's activities. The Convention provides a broad but non-exhaustive list of factors to be considered in deciding what qualifies as a reasonable and equitable use in any particular case. Article 6.1 provides a non-exhaustive list of factors and an indication of how these are to be used, in order to ascertain an equitable and reasonable use.

Article 7 of Water Convention obliges the parties to prevent the causing of significant harm and to take actions whenever such harm is nonetheless caused incorporating the principle "obligation not to cause significant harm.[89] The final text of the Watercourses Convention mentions "significant" harm, while the Draft Articles referred to "appreciable" harm (appreciable, substantial and significant harm are discussed 2.1.1.)[90] The reasonable use of property and territory can under some circumstances cause factual harm, but that does not in itself lead to legal harm. But some forms of harm may be considered per se unreasonable, as, for example, where the harm endangers human health or is of an irreparable or long-lasting nature and it is significant to determine the authentic harm. Article 6.3 of the Watercourses Convention requires that in allocating fresh water between its different uses all

[88] Article 12 of the Berlin Rules 2004.
[89] Article 7 of the Water Convention.

relevant factors and circumstances have to be taken into account and weighed against each other and a conclusion is to be reached on the basis of the whole. So, states to utilize a watercourse is formed by the obligation not to cause harm beyond national jurisdictions as formulated in Article 7.

Unlike many bilateral agreements,[91] the UN Convention has provisions for dealing with pollution of a watercourse. Even in 1966, the Helsinki Rules introduced pollution clause, the Berlin Rules 2004 also provided a whole chapter dedicated to the protection of aquatic environment and ecological integrity.[92] Article 21 of the UN Convention says, "For the purpose of this article, 'pollution of an international watercourse' means any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct". Moreover, protection and preservation of ecosystems is embodies in the Convention. [93]

However, both of the instruments recognized the principle of equitable and reasonable utilisation as the predominant normative concept of international water law to achieve an equitable balancing interest with significant harm in accordance with a non-exhausted list of factors. Although, due emphasis is put forward on pollution of watercourse, remains inadequate due to procedural mechanisms to mitigate the pollution. The Convention's approach permits variable "weighting" to be given the factors put forward in each particular case and this may often strengthen the case against pollution harm. The Convention is somewhat lenient in its approach towards protection and preservation of ecosystem international watercourses.

[90] Report of the International Law Commission on the Work of its Forty-Sixth Session, *UN Doc*. A/49/10 (1994).
[91] For example, Ganges water Treaty. 1996.
[92]Chapter V, Berlin Rules, 2004.

Procedural Rules: Issues of Compliance and Implementation

Procedural rules set down in the 1997 Water Convention codified many of existing rules of customary international law and addresses these issues concerning watercourse management. The Convention incorporates a comprehensive set of rules of procedure concerning planed measures including exchange of information (Article 11), notification (Article 12-14), and consultation and negotiation (Article 16 and 17). Planned measures are defined as 'new projects or programs of major or minor nature'.[94] Article 24 clarifies what kinds of "management" joint commissions might undertake.[95] Moreover, Article 20 emphasised on prior notification of planned measures, establishment of joint management mechanisms for the "protection and preservation of ecosystems, and so on.

Dispute Settlement

The international law, agreements and forums have all pointed towards the importance of achieving a dispute resolution regarding water-sharing disputes Both UN Convention and Berlin Rules emphasized the use of a strict dispute settlement procedure. The UN Convention is particularly mentionable in this regard. Article 33 of the Convention provides the dispute settlement mechanism. According to Article 33, when agreement cannot be reached by negotiation, parties are to seek good offices, request mediation or conciliation, or agree to submit the dispute to arbitration or the International Court of Justice. It is remarkable that the water Convention provides the scope for third party involvement in the dispute settlement procedure. Third party involvement is significant in view of limitations of bilateral efforts for

[93] Article 20 runs as follows: "Watercourse States shall, individually and, where appropriate, jointly, protect and preserve the ecosystems of international watercourses".
[94] The commentary to Article 11, 1994 ILC Report, Para 4, p.260.
[95] Article 24(2), "For the purposes of this article, "management" refers in particular, to: (a) Planning the sustainable development of an international watercourse and providing for the implementation of

conflict resolution, for example, the case of India-Bangladesh water conflict. It is mentionable here that this third party involvement in the dispute settlement procedure is but the recognition of the obstacles faced by countries, especially in cases where the bargaining power is unequal between the parties, as we have found in our present case. It is not surprising that countries with comparative advantageous bargaining positions, including India, opposed this provision for the ,[96] even though India itself is a beneficiary of third party involvement in the negotiation process in its Indus Water Sharing Treaty with Pakistan. However, the role of third party involvement in case of sharing of Ganges water conflict and prospect for cooperation is further examine in the section 2.2 of chapter four.

2.3. Other Regional Instruments

The UN/ECE Convention on the Protection and Use of Transboundary Watercourse and International Lakes, 1992, (Helsinki Convention)[97] is one of the recent conventions that include almost the whole spectrum of established and emerging international water law with the geographic need for regional solutions. It deals with the prevention, control and reduction of transboundary impacts relating to international watercourses and lakes, with a strong emphasis on pollution-prevention. Its principal aims are the protection and ecologically sound and rational management and reasonable and equitable use of transboundary waters along with the conservation and restoration of ecosystems. All parties to the ECE Convention are obliged to prevent, control and reduce any transboundary impact (Article 2.1), relating to water and pollution and use. Article 2 includes reference to: reasonable and equitable use of transboundary

any plans adopted; and (b) Otherwise promoting the rational and optimal utilisation, protection and control of the watercourse".

[96] United Nations General Assembly Press Release GA/9248. India's official reservation includes, among other things, that "[a]ny mandatory third-party dispute procedure was inappropriate and should not be included in a framework convention".

waters, equality and reciprocity, and catchment areas. It also includes principles such as the precautionary principle, polluter-pays principle, and sustainable development in water resources ('water resources shall be managed so that the needs of the present generation are met without compromising the ability of future generations to meet their own needs'). Article 3 elaborates upon the measures to be taken to prevent, control and reduce transboundary impact, including emission of pollutants and environmental impact assessment.

EU Water Framework Directive[98] is also important particularly from the ecological governance aspects. Article 2.21 of the directives defines ecological status as 'an expression of the quality of the structure and functioning of aquatic ecosystems associated with surface waters, classified in accordance with Annex V'. Moreover, many of the elements of sustainable development appear to be present in the Directive. Whether, for example, the possible derogations from "good ecological status" for social and economic reasons in practice result in a balanced approach to sustainable development or in trade-offs presenting a bias needs to be further reviewed.

In the light of the above discussion on the international instruments, particularly UN Water Convention incorporated the important emerging and established substantives rules accompanied by a comprehensive set of procedural rules within a framework of water allocation to cooperate, exchange information, provide prior notification of planned measures, establish joint management mechanisms, and so on. The principle of equitable and reasonable use, allows each State to present all factors

[97] Concluded under the auspices of the Economic Commission of Europe and adopted by 24 European countries and the European Union.

relevant to the particular situation, places the parties on equal grounds and facilitates both in process and in substance. Based on the need based approach on water allocation the Convention persuades the search for solutions by technical experts, as opposed to assertions of legal "rights advanced through a series of claims and counter-claims. In this regard, the claims of Bangladesh in the section 5 of this chapter would shed the light of its effectiveness since balancing factors varies case by case. Since those factors balance the interests between the basin states, Water Convention does not offer compulsory dispute settlement procedure. Although, third party involvement option in the dispute settlement procedure offers an unique opportunity, the ICJ has yet to play an effective role to resolve the international water resource management disputes due to jurisdictional and procedural limitations. The ICJ lacks compulsory jurisdiction to hear any case since it depends on the parties' consent to bring the issue before International Court of Justice. As a result, the Watercourses Convention cannot compel the concerned states to settle their disputes.

However, it is important to note that Water Convention does not include particular rules and regulations in relation to the new notion of sustainable development with due weight on environment and ecological aspects which is very significant for water resources envelopment for the interest of present and future generation. It is remarkable that the regional instruments, including the 1992 ECE Convention, EU Water Framework Directive comprised with details substantive and procedural rules on integrated ecosystem-oriented approach. Nevertheless, duty to notify provision of the Water Convention, acknowledges the link between effective notification on adverse effects concerning planned measures and transboundary Environmental Impact Assessment (EIA). Due to uncertainty as to particular activity

[98]Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000

undertaken by the basin co-basin state to which other states likely to be affected, hence the obligation arises to notify potential affected states based on study and evolution that implies the principle of environmental impact assessment, precautionary principles and the more inclusive ecosystem approach.[99]

Although the water Convention did not explicitly incorporate these emerging principles of international environmental law and sustainable development, the principle of reasonable and equitable utilization approximates with and operationalizes the notion of sustainable development.[100] So, considering the necessity of this research study, there is a particular chapter (third chapter) is set out to deal with the emerging notion of sustainable water resource development and management with due importance on ecological governance. Moreover, duty to notify in the broader aspects of sustainable utilization of watercourses may be facilitate by effective institutional mechanisms, those require the technical cooperation by bilateral or multilateral agreements and therefore the fourth chapter necessarily undertakes the comparative study on institutional arrangements of other international basins

However, a new dimension has been added to the regime of the international watercourses law as a result of *Gabdkovo-Nagymaros* case,[101] which is the first comprehensive case decided by ICJ recognizing the provisions of the Convention while the 1997 Convention had not been ratified by a single State. This case, between Hungary and Slovakia, involved an international watercourse. The decision of the International Court of Justice is particularly relevant and instructive for this study and hence discussed in the next section.

[99] Article 13 of the Water Convention.

2.4. Decisions of International Court of Justice in the Gabcikovo-Nagymaros Case

The case involved a dispute between Hungary and the Slovak Republic over a 1977 Treaty[102] regulating the development of a series of installations for improving the hydro-power generation, the environment, and navigation, flood and ice control on the Danube River. The main feature of the 1977 Hungary-Czechoslovakia Treaty was the development of hydro-electric power and navigation, with projects to be carried out in each country at its own expense. The dispute arose when Hungary unilaterally suspended the work on its portion causing Czechoslovakia/Slovakia in turn to unilaterally implement "Variant C", one of the Czech/Slovak alternatives for developing the relevant section of the Danube. It is noteworthy to mention that the suspension by Hungary came in response to new evidence, as well as to a wave of protests from environmentalists, suggesting that the project was likely to result in grave environmental damage, both within and outside the country. [103] However, each of the party claimed that the other had breached its international obligations under either the 1977 Treaty or general international law and subsequently two governments agreed and referred the dispute to the International Court of Justice for resolution.

The ICJ decided the case on general international treaty law and confirmed the legal validity of the 1977 Treaty but referred to the principle of reasonable and equitable utilization and the 1997 UN Watercourses Convention. Regarding Slovakia's unilateral diversion of the Danube, the Court referred to Hungary's "basic right to an equitable and reasonable sharing of the resources of an international

[100] P.K. Wouters and A.S. Rieu- Clark, *The Role of International Water Law in Promoting sustainable Development, 2001,* 12 Water Law, 281, p. 283.
[101] Case concerning the Gabcikovo-Nagymaros Project (Hungary/Slovakia), ICJ Reports 1997,
[102] Treaty between the Hungarian People's Republic and the Czechoslovak Socialist Republic Concerning the Construction and Operation of the Gabcikovo -Nagymaros System of Locks, Sept. 16, 1977, The 1977 Treaty came into force on June 30, 1978.
[103] Supra note, 2, Pp. 10.

watercourse**".**[104] The Court found that Slovakia "failed to respect the proportionality required by international law and thus deprived Hungary of its "right to an equitable share of the natural resources of the Danube". [105] The Court concluded that Hungary had a basic right to an equitable and reasonable sharing of the resources of an international watercourse which was violated by Czechoslovakia/Slovakia's implementation of Variant C.[106] Moreover, the Court added: modern development of international law has strengthened the principle expressed in the River Oder case that "the community of interest" in a navigable river becomes the basis of a common legal interest for non-navigational uses of international watercourses.[107]

The particular relevancy of the decision in relation to environment and ecology is remarkable. The claim of Hungary was based on environmental harm due to unilateral withdraw of water from an international river and tried to justified by the reference to a "state of ecological necessity. The court rejected the argument due to evidence of "grave and imminent peril" and implicitly endorsed the principle of equitable and reasonable utilisation as a governing principle of the watercourse law. The ICJ decision contained "no mention of the *sterile and misconceived* debate over the relationship between Articles 5 and 7" of the UN Convention.[108] If the situation had been different, i.e. if there had been prove of significant harm resulting from the actions of Slovakia, the Court could not easily avoid dealing with this issue.[109]However, the Court emphasised in particular, the importance of balancing

[104] Supra note 118, Para. 78
[105] *Ibid,,* Para. 85
[106] *Ibid.*
[107] Dr. Patricia Wouters, *The Legal Response to International Water Scarcity and Water Conflicts: The UN Watercourses Convention and Beyound*, available at: file:///C:/Documents%20and%20Settings/Mohammad/My%20Documents/hafiz/thesis/Water%20Law/The%20Legal%20Response%20to%20International%20Water%20Scarcity%20and%20Water%20Conflicts.htm
[108] *Ibid*
[109] Sands, P. *'Watercourses, Environment and the International Court of Justice: The Gabcikovo-Nagymaros case'*, 1998.

environmental and developmental concerns.[110] Moreover, The Court asked the parties to negotiation to find a solution based on the existing treaty and norms and principles of international water and environmental laws.[111]

However, in the light of above discussions on principles of customary international law, international instruments and decisions of the courts and tribunals and existing Treaty between India and Bangladesh, it is important to establish the legal claims for equitable share and sustainable water resource management and therefore following section deals with the legal arguments in favor of Bangladesh.

2.5 India-Bangladesh water conflict and the water law and principles

"The north of Bangladesh is already drying out after the Ganges was dammed by India in 1976. Now India is planning to do the same on [many of] the 53 other rivers that enter the country via India. Bangladesh depends completely on water...We want no kind of war, but international law on sharing water is unsure and we would request the UN to frame a new law. It would be a last resort." [112] An appeal of the then water resource minister of Bangladesh to frame a new legal framework definitely reflects the frustration to deal with the complicated disputed issues, which has been one of the longest lasting for near about three decades. It has become increasingly frustrated at bilateral discussions which appear to go no-where, and has resorted to appealing for international involvement and support. It is by no means uncommon for states in Bangladesh's position to resort to appeals for international intervention and jurisdiction.

[110] Supra note 99, the judgement including the dissenting opinion of Judge Oda and separate opinion of Judge Weeramantry.
[111] Supra note 118, Para 114
[112] The cautions made by Hafiz Ahmad and then water resources minister of Bangladesh, (as quoted by John Vidal, The Guardian, 24 July 2003.).

However, the outcomes of the foregoing sections in this chapter that systematically analyzed the different elements of transboundary water resource management from the international law perspectives would guide to outline the basic questions relevant to the disputed issues and to provide legal arguments against the unilateral withdraw of waters by India from international rivers, without considering the legitimate interest of Bangladesh. Identified issues are equitable share of *Ganges* water, particularly debate concerns around the competing claims for the limited dry season flow and redistribution of rivers flow at the Farakka barrage and proposed Indian river-linking projects, which would be argued in the line of international law and principles those govern the transboundary river basin conflict and management.

The legal response to transboundary water conflict has a solid foundation in the UN Water Convention.[113] The 1997 UN Convention can and should play the guiding role for India-Bangladesh water conflict issues. Moreover, the ICJ in the *Gabcikovo-Nagymaros Project Case* has shown that this Convention is the statement of international law in this field, although it is not in force yet embodies customary rules of international law. The Berlin Rules 2004 would provide with necessary aid in interpreting and understanding customary international law, and there are questions as to whether the *UN Convention* always correctly states that law".[114] It is note worthy in this regard that the process of ratification of the *UN* has been slow, and States will need to continue to apply customary international law.

Unilateral withdrew of water from international river Ganges through *Farakka Barage* and its adverse impacts on Bangladesh clearly causing damage to the territorial integrity of Bangladesh. The counter claim of India relying on equitable and reasonable utilization of water allocation for industrial purpose would not be justified.

[113] Supra note 107.

Rather India violates the sovereign right of Bangladesh to a reasonable and equitable share of the Ganges waters. The principle of equitable and reasonable utilization is the cornerstone relied primarily upon competing sovereign rights of riparian states as conceptual devices for the limitation of sovereignty. Established legal principles and decisions of the courts and arbitrations[115] including *Gabcikovo-Nagymaros* case support this contention. In view of the fact that Slovakia's unilateral diversion of the Danube, the ICJ in the *Gabcikovo-Nagymaros* recognised that Hungary's "basic right to an equitable and reasonable sharing of the resources of an international watercourse" and Slovakia 'failed to respect the proportionality required by international law and thus deprived Hungary of its "sovereign right to an equitable share of the natural resources of the Danube'.[116]

Moreover, the evidences found in this study for example the desertification process that is already evident in the northern parts of Bangladesh as a result of the Indian Farakka dam on the *Gange* river[117] are sufficient enough to determine the appreciable harm that relates the agricultural productivity, water pollution, public health, economy, environment and ecology, overall life and livelihood occurred as a direct result of the diversion of the river and the operation of the *Farakka Barrage*. Therefore it supports the contention that India violates the principle of the obligation not to cause appreciable harm, which qualifies the counter claim for India of reasonable and equitable utilization of an international river. In the section 21 of this chapter balanced the conflict of interests between India and Bangladesh considering all the qualifying factors and concluded that domestic industrial use of international

[114] Preface, The Berlin Rues 2004.
[115] *The Lake Lanoux case, the River Oder, the Trail Smelter case, Chorzow Factory case, Corfu Channel case, and Legality of the Threat of Use of Nuclear Weapons case.*
[116] Supra note 100, Para. 78
[117] Hossain, Ishtiaq, *Bangladesh-India Relationship: The Ganges Water-Sharing Treaty and Beyond*, 1998.

rivers where alternatives are available can not prevail the interest of basic human need, life and livelihood for present generation and future generation.

Moreover, since one-third of the total area of Bangladesh is affected due to *Farraka* Barrage and if India implements proposed river-linking project that supposes to reduce flow from other rivers of Bangladesh and it would be threatening for 130 million people of Bangladesh. In case of proposed river linking project, there is enough opportunity to prevent possible harm within a framework under the UN Convention that includes a comprehensive set of procedural rules for planned measures to cooperate, exchange information, provide prior notification of planned measures, establish joint management mechanisms, and so forth. Notion of sustainable development discussed next chapter would suggest more arguments based on environmental obligations.

Moreover, in the views mentioned above and perspectives of international law on Tranboundary River there is a clear case for the Apex court to review its order on to implement proposed linking project "networking rivers". It is one of the cardinal principles of international law that a municipal court is bound to respect customary international law. It can not act in disregard of well established and customary principles of international law, particularly when such directive or decision involve question of international law and can produce far reaching negative consequences for the welfare and survival of people of other state. Thus, a municipal court can not simply overlook the basic principles of international law of Rivers that takes into account the legitimate interests of both upstream and downstream countries in utilization of the waters of these rivers

However, both the Farakka Barrage and propose riverlinking project violates the substantive rule of reasonable and equitable utilization of International River. Now

dispute settlement procedure need to be examine to pursue these legal claims. The provisions for the peaceful dispute settlement are provided well by the Water Convention, in the final analysis, Watercourses Convention can not compel the concerned states to settle their disputes. Thus it apparently seems that the principle of equitable use justifies opposing claims without offering a resolution, rather than an open-ended framework for political compromise without an independent legal identity. This may, or may not, result in a political compromise, but the rule, and its implementation, have an independent legal identity tied to the broader legal concept of allocation fairness. Therefore an allocation choice must meet the test of perceived fairness if it is to succeed. The pursuit of a shared perception of fairness is the necessary starting point for devising any lasting allocation rules that are likely to command respect and pull towards voluntary compliance.[118]

The principle of equitty and fairness is found in the existing Ganges water treaty. Article 2 of Ganges Water Treaty requires the parties, to apply the principles of equity and no harm if the available Ganges flow falls below 50000 cusecs at the agreed point of apportionment. Moreoevre, Article 9 of the treaty provides that both governments have agreed to conclude water-sharing agreements with other common rivers on the basis of principle of 'equity', 'fairness' and 'no harm to either party.' This provision of treaty obligates to the State parties to enter into similar bilateral legal arrangement with respect to allocation of other international rivers shared by them. The treaty also contains principles like "good neighborliness", "optimum utilization of the water resources", "fair and just solution" in its preamble. The preamble of treaty also commits to the resolution of other important issues like irrigation, river basin development and generation of hydroelectric power by mutual agreement for the

[118] Supra Note 107.

benefit of the peoples of the two countries. So under the treaty provisions India is compelled to ensure the equitable share of Ganges water allocation and to refrain from diverting water from other international rivers. It is worthy to mention here that, the case of *Gabcikovo-Nagymaros* case revolved primarily around the issues of treaty law, and the Court found Hungary in breach of its international obligations under the 1977 Treaty. Moreover, the parties to the dispute were requested by the Court to conduct negotiations to ensure continued compliance by each side with the 1977 Treaty to find "an agreed solution that takes into account the [1997] Treaty . . . as well as the norms of international environmental law and the principles of the law of international watercourses".

Under current circumstances, the government of Bangladesh will probably try to engage India in a fruitful discussion on equitable share of the *Ganges water* and the proposed Interlinking of Rivers arguing the adverse environmental and ecological impacts for Bangladesh in the light of these legal provisions, and established customary international laws. Moreover, considering the environmental and ecological aspects co-basin states are obliged to undertake projects that are sustainable. Therefore, the concept of sustainable development considering the new notion of water resource management is discussed in the next chapter with due references to emerging principles of cooperation in the international law.

Chapter Three

International water law traditionally has centered on the development of water resources for consumptive uses. However, water has become subsumed by the environment, and loosing its relatively distinctive status as a separate area of global concern, since the emerging international environmental law focuses on protecting the resource from development in favor of environment and ecological concerns, those

call for sustainable development. Consequently, competing claims to water between users within countries and between countries will have to be managed in a cooperative rather than confrontational fashion ensuring the environmentally sound development. The emerging environmental rules and principles alluded to over emphasize the likely significance of environmental factors in this process and provide detailed mechanisms and procedures by means of which environmental considerations can be taken on board and environmental damage can thus be prevented or mitigated.

Therefore substantive and procedural rules and principles of environmental laws with due references of watercourse law are analyzed in this chapter from the aspects of sustainable development and ecological governance with a view to establish further arguments in favor of equitable and sustainable water resources management between India and Bangladesh.

3.1. Water negotiations: A new regime of sustainable development

The growing awareness of the interrelationship between freshwater resources and sustainable development is increasingly reflected in international law. The importance of sustainable management of transboundary water resources has also been recognized by the international community adopting the Water Convention in 1997. Moreover, the commitment to sustainable development in relation to water resources is to be found incorporated in various multilateral treaties, include treaties on climate change, biological diversity, desertification, watercourses, the treaty establishing the WTO, and regional treaties such as the ECE treaties, the EC Treaty.

The emerging international law on sustainable development can provide guidance further for the evolution of international law toward sustainable

development.[119] The ILA New Delhi Declaration identifies seven main principles of international law particular in relation to human rights and social, economic and environmental objectives.[120] The ICJ explicitly referred to the concept of sustainable development in the *Gabcíkovo-Nagymaros* case on the Danube river. The ICJ stated that 'This need to reconcile development with protection of the environment is aptly expressed in the concept of sustainable development.' Vice-President Weeramantry in the said case, in his separate opinion to the judgment stated that the principle of sustainable development is 'a part of modern international law by reason not only of its inescapable logical necessity, but also by reason of its wide and general acceptance by the global community.'[121]

Since right to development is considered as a third generation of human right, however, subject to qualify since 'the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.'[122] Hence the concept of right to environment, the principle of Intergenerational Equity and Integrated Water Resource Management (IWRM) and *the principle of a common interest of humankind* are discussed further to lustrate the notion of sustainable development.

Right to Environment

The right to environment and right to development have emerged as a third generation of human rights. These two new branches of rights have added new dimensions to the traditional concept of justice that, in many parts of the world are

[119] First Report of the ILA Committee on International Law on Sustainable Development (2004), The ILA Committee on International Law on Sustainable Development, formed in May 2003, builds upon the work of the Committee on Legal Aspects of Sustainable Development
[120] The ILA New Delhi Declaration, available at: www.un.org/ga/57/document.htm.
[121] Opinion of Vice-President Weeramantry to the *Gabíkovo-Nagymaros* Judgment, Para. A(c)
[122] Principle 3 of the Rio Declaration

opening up to allow spaces for environmental justice. Environmental rights have emerged in many countries under the constitutional protection of right to life, liberty, body reputation or property that are inalienable except in accordance with law.

Supreme Court of India, interpreted the right to life guaranteed by article 21 of the Constitution to include the right to a wholesome environment *Charan Lal Sahu* Case and *Subash Kumar,* the Court observed that 'right to life guaranteed by article 21 includes the right of enjoyment of pollution-free water and air for full enjoyment of life.'[123] Moreover, in the *M.C. Mehta v. Union of India case,* Court ordered to ensure a better quality of environment and to restore the quality of environment. In Bangladesh *right to life (*Article 31 of the Constitution of Bangladesh, 1972) has been extended to include *right to a safe environment* when the importation of radiated milk was challenged through a writ petition[124] and the Court stated Art. 31 and 32 of the constitution encompass within its ambit, the protection and preservation of environment, ecological balance free from pollution of air and water, sanitation without which life can hardly be enjoyed. According to Judge Weeramantry, in his Separate Opinion to the *Gabcíkovo-Nagymaros* case, environmental rights are human rights.[125]

The interrelationship between human rights and the environment is also increasingly recognized within international instruments. The UN Commission on Human Rights states: 'the promotion of an environmentally healthy world contributes to the protection of human rights'.[126] Principle 1 of the Stockholm Declaration[127] formulates the right to a healthy environment as follows: Man has the fundamental

[123] *Subhash Kumar v. State of Bihar* (AIR 1991 SC 420/ 1991 (1) SCC 598.
[124] WP No. 92/1996 The appellate Division of the Supreme Court of Bangladesh, 1997, 49DLR(AD)
[125] Supra note 116 Para, B.
[126] Resolution 1995/14 of the UN Commission on Human Rights, *UN Doc.* E/CN.4/RES/1995/14.
[127] 1972 Declaration of the UN Conference on the Human Environment (Stockholm Declaration).

right to freedom, equality and adequate conditions of life, in an environment of quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations. However, identify of an emerging separate international human right to a healthy environment would provide an additional way to protect both ecological and social interests at the local and international level.

Principle of Intergenerational Equity

Access to water and utilization of water resources are the basic needs of all people of the present and future generation. Over exploitation of freshwater resources, degradation of water quality, diversion of water causes problems and impact remains for a long period and sometimes harm caused permanently for ecological order. Hence raise the issue of right of the next generation considering the needs of future generation. In the *Gabcíkovo-Nagymaros* case, the ICJ stated that: 'the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn.'[128] Moreover, Judge Weeramantry stated in his dissenting opinion in *Nuclear Tests case* opined that: "*… the principle of intergenerational equity - an important and rapidly developing principle of contemporary environmental law...The court has not thus far had occasion to make any pronouncement on this rapidly developing field...[The case]...raises in pointed form the possibility of damage to generations yet unborn."*

The *Minors Oposa* case[129] is notable case at the national level regarding this principle. In this case, Philippines Supreme Court allowed an NGO to represent children and generations yet unborn and to challenge the large-scale destruction of

[128] Supra note, 100 Para. 53.
[129] Supreme Court of the Philippines, *Minors Oposa v. Secretary of the Department of Environment and Natural Resources*, case of 30 July 1993, 33 *ILM* (1994), Pp. 173.

Philippine rain forests. However, Intergenerational equity already is an integral feature in many international legal materials dealing with sustainable development. It was also observed by some of the renowned jurists in light of few cases recently decided by ICJ that this concept is already arguably a norm of customary international law.[130]

The Principle of a Common Interest of Humankind

Since environment is a global concern, there is a general recognition that humankind has common interests in protecting and managing environmental challenges, such as the climate system, the ozone layer, the rain forests, and biological diversity for both present and future generations.[131] The high seas, the deep seabed, the moon, and their respective resources located beyond the boundaries of natural jurisdictions are open to every nation and regarded as the common heritage of humankind.[132] Article 4 of the Convention for the Protection of the World Cultural and Natural Heritage, 1972, provides that the duty of the Contracting Parties to ensure 'the identifications, protection, conservation, presentation, and transmission to future generations of the cultural and natural heritage.

From the global ecological aspect the hydrological system is also considered a common heritage of humankind, since international rivers that pass through across the borders via the hydrological system involving fresh water resources.[133] On the other hand, regarding freshwater resources as a common heritage within international law could be blocked by the notions of sovereignty and territoriality. But the global

[130] Greg Maggio,Owen J.Lynch , *Human Rights, Environment, and Economic Development: Existing and Emerging Standards in International Law and Global Society*, Center for International Environmental Law, November 15, 1997.
[131] ILA Committee on Legal Aspects of Sustainable Development (2002), Pp. 10.
[132] Art. 136 of the UN Convention on the Law of the Sea, 1982; Article 11, 18 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 1979.

environment and ecological concern is not only a matter of concern among discrete states, i.e., "acting" states and "affected" states, but is a matter of concern to the entire international community. It is very important to note that the Sundarbans the largest mangrove forest in the world at the mouth of the Ganges rive designated as a UNESCO's World Network of International Biosphere Reserves 2001 considering the importance in terms of biodiversity and complex ecosystem.[134]

Integrated Water Resource Management (IWRM)

Since environmental degradation is a global concern and correspondence with development, including problems with water related ecosystem worldwide, requires coordination of processes, comprehensive consideration of related factors and various kinds of cooperation to manage the water resources to ensure the sustainable use. Hence the concept of Integrated Water Resource Management (IWRM) is important for transboundary water resource management and particularly for this study. According to *GWP Technical Committee* (TEC) Background Paper No. 4, IWRM may be defined as: a process which promotes the co-coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.[135]

The Rio Declaration initiates an attempt to achieve an integrated approach. Chapter 18 states that integrated water resources planning and management are needed and that the many interests involved in utilization of water resources must be

[133]Reference to the hydrologic system is made in Recommendation 51 of the UN Conference on the Human Environment, which emphasizes that 'the net benefits of hydrologic regions common to more than one national jurisdiction are to be shared equitably by the nations affected'.

[134] Sundarbans is designated as a UNESCO's World Network of Inrenational Bioshere Reserves since 2001.

[135] Torkil Jønch-Clausen, *"...Integrated Water Resources Management (IWRM) and Water Efficiency Plans by 2005" Why What and How?* Global Water Partnership, 2005.

recognized.[136] Article 26 of the Plan of Implementation of the World Summit for Sustainable Development (WSSD) in Johannesburg in 2002, states that countries should *"Develop IWRM and water efficiency plans by 2005, with support to developing countries..."* According to the preamble of the ILA New Delhi Declaration, sustainable development is now widely accepted as a global objective and is a matter of common concern, to 'be integrated into all relevant fields of policy in order to realize the goals of environmental protection, development and respect for human rights'. However, the principle of integrated Water Resource Management is not established in general international law but might be evolving considering the increasing importance and acceptance of its components and it requires extensive cooperation among the concerned states and international community.

3.1.1. Ganges-Brahmaputra-Meghna river basin and sustainable development

Water is the central resource and the key to its development for this region, therefore, it is very important to explore the potential for cooperation for the sustainable development of the water and biotic resources of the region, and also to understand and appreciate each other's perspectives and needs. With the signing of Ganges water treaty between Bangladesh and India in 1996 and the treaty on *Mohakali* river between India and Nepal in 1996,[137] the climate in the region is changed and there is a desire to create an atmosphere of confidence. But those treaties need to be advanced incorporating established and emerging substantive and procedure rules and principles to ensure sustainable management and development. Moreover, to realize the potential domestic and transboundary adverse impacts of proposed riverlinking project, alternatively additional water augmentation agreement

[136] See Chapter 18.1 and 18.3 of Agenda 21.

could take place between Bangladesh, India, and Nepal with an approach of integrated water resource management within the region through effective institutional mechanisms. Therefore it requires political consensus and efforts realizing the human need of this region. The Male Declaration 1997 and the Colombo Declaration 1998 of the SAARC enhanced regional cooperation by endorsing the idea of joint projects. Efforts of joint projects for optimum control, conservation and use in power generation and flood control would benefit beyond national boundaries. Comprehensive development strategy for the utilization of the water resources of the region can enhance social and economic conditions of the people.

3.1.2. Financial institution and sustainable development

Projects concerning transboundary watercourse often require grand scale funding and the international financial institutions such as the World offers financial assistance to implement those projects. In our present case, the Interlinking of Rivers Project is the biggest Indian Project ever and the biggest freshwater development project of the world. India is trying to get help from the World Bank and negotiating with the government of Texas to get technical help in attaining its goal. The World Bank and all other such institutions have adopted a common policy to fund any project based on the environmental impact assessment report to ensure the sustainable development. World Bank's Operational Directive on Environmental Assessment[138] sated that, 'the purpose of EIA is to improve decision making and to ensure that the project options under consideration are environmentally sound and sustainable'.

But the trend is that globalization and the resultant emergence of giant multinational corporations have allowed state mechanisms to avoid that obstacle when

[137] Sarada Agreement (1920) on the Mahakali River, which is now encompassed by the Mohakali Integrated Development treaty, 1996, Nepal ratified the Mahakali Treay on 20 September 1996, India on 27 november 1986.

pursuing anti-people and/or anti-environment projects by including those multinational corporations in the project. Nevertheless, financial and technical support of different financial institutions could promote the sustainable development in accordance with the policy adopted for environment friendly project initiations.

3.2. Avoiding environmental degradation and ecological governance

Environment and ecological degradation and disasters are very significant alarm for the international community as well as to states and, individuals. Dams (*Farraka Barrage*), large diversions (Proposed liver-linking project of India) and pollution (Ganges water pollution), pose a serious threat to existing ecosystems, causing harm in the flow and quality of watercourses. Ecological concern is explicitly expressed in various international legal instruments. Article 2 of the UN Convention on Biological Diversity[139] defines the ecosystem as such 'Ecosystem means a dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit.'

The impact of ecological disorder in relation to use of water cannot easily be reversed in certain situations. The uncertain and possibly irreversible impact of water degradation demands the need for an integrated, transboundary and proactive approach. The ICJ in the *Gabcíkovo-Nagymaros* case stated: *'The Court is mindful that, in the field of environmental protection, vigilance and prevention are required on account of the often irreversible character of damage to the environment and of the limitations inherent in the very mechanism of reparation of this type of damage*.' Hence it requires a proactive approach toward protection of water related environment

[138] World Bank's Operational Directive on E IA, O.D. 4.01, October 1991, Para. 2
[139] The Convention on Biological Diversity was adopted at the Earth Summit in Rio de Janeiro in 1992. The Convention has three main goals: conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising from genetic resources.

and ecological order and demands the policy framework for environment and ecological integrity guided by the emerging principles such as precautionary principle, no harm principle and environmental flow principle and those are discussed below.

The precautionary principle

Considering the scientific uncertainty of the environmental issues, a major challenge of international environmental policy-making is to identify, assess, and manage the risks of environmental degradation. The precautionary principle, which states that action, should be taken to prevent to prevent potential environmental harm in relation to water that poses detrimental effects on public health, environment and ecology, reflecting the bio, geo and chemical complexity of water, over which there may exist scientific uncertainty. Article 15 of the Rio Declaration, stated the precautionary principle is as follows: 'In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.' Principle 4 of the ILA New Delhi Declaration moreover includes accountability for harm caused consideration in an EIA of all alternatives to achieve an objective, and a shift in the burden of proof in the case of possible serious long-term or irreversible harm. The Berlin Rules underline the importance of the precautionary principle for the protection of aquatic environments (Article 23) and groundwater (Article 38).

The question arises whether the precautionary principle is established as a part of international customary law. Although still debated, it appears that the precautionary principle is becoming more and more established in international

environmental law. The precautionary principle is included in almost all international environmental instruments adopted since 1990 and in the ILA New Delhi Declaration. It was not mentioned by the ICJ in the *Gabcíkovo-Nagymaros* case, descending opinion articulated the term [140] but at the national level, it was explicitly embraced as a legal obligation by the Indian and Pakistan Supreme Courts.[141] Moreover, The International Tribunal for the Law of the Sea (ITLOS) has also dealt with interesting cases with an impact on principles governing freshwater management, such as the *Southern Bluefin Tuna* case.[142]

The duty to prevent, reduce and control transboundary environmental harm

The principle of the duty to prevent, reduce and control transboundary environmental harm imposes obligation to prevent damage to the environment, or to otherwise reduce, limit or mitigate such damage. This preventive principle requires action to be taken at an early stage and, if possible, before damage has actually occurred, thus oblige to minimize environmental damage. Article 11 of the Rio declaration provides that, 'States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.'

Therefore, states are obliged to enact effective environmental legislation that would help to reduce, prevent environmental harm that might cause harm for neighboring states. Therefore this principle lies an obligation under international

[140] Only Judge Weeramantry used the term in his dissenting opinion. See, Mirjam van Harmelen, Matthijs S. van Leeuwen and Tanja de Vette, *International Law of Sustainable Development: Legal Aspects of Environmental Security on the Indonesian Island of Kalimantan*, October 2005.
[141] The ILA Committee on Water Resources Law (2004), at p. 28

environmental law upon the states which national legislation to prevent, reduce, limit or mitigate the environmental harm. This principle has special significance for the transboundary water course management since the lack of strict, national legislation seems to be a major cause for the transboundary environmental harm through water flow..

The Principle of Environmental Flow

From the ecosystem perspective of integrated water resources management environmental flows would play a crucial role for transboundary river basin management to ensure downstream environmental, social and economic benefits. 'Environmental flows are an integral part of the modern management of a river basin.'[143] An environmental flow is the water regime provided within a river, wetland or coastal zone to maintain ecosystems and their benefits where there are competing water uses and where flows are regulated.[144]

International instruments those deal with water resources management and protection of environment and ecology particularly relating to non- navigational uses of rivers. From the environmental flows aspect Water Convention and the Helsinki Rules are particularly significant. Different provisions include options to prevent, reduce and control pollution of water causing or likely to cause tranboundary impacts, to ensure that transboundary waters are used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection. Some other regional instruments, such as Helsinki Convention, the

[142] *Southern Bluefin Tuna* cases (provisional measures), New Zealand and Australia *vs*. Japan, ITLOS Nos. 3 and 4 (1999). The ITLOS allowed for provisional measures to protect the tuna stock because of scientific uncertainty on the conserv ation of tuna stocks.
[143] John Scanlon, Angela Cassar and Noemi Nemes, *Water as a human right*?, IUCL Environmental law and Policy paper No. 61, 2004
[144] *Ibid*

Mekong River Agreement,[145] the Protocol on Shared Watercourses Systems in the Southern Africa Development Community[146] provides the provisions for environmental flow.

Principle of territorial integrity can imply with the principle of environmental flow, that oblige the flow of a river may not be disturbed by an upstream state. Chapter two discussed these principles in the perspective of water allocation with due reference to limited territorial sovereignty and integrity and state practices.

However, transboundary water management and ecological governance are contemplated as an integrated approach to ensure better management of shared water resources for the present and future generation. Cooperative efforts and negotiation among co-riparians based upon the principles in relation to sustainable development, environment and ecology as discussed leads to examine the disputed issues between Bangladesh and India from that perspective.

3.2.1. India-Bangladesh shared resource management and ecological governance

The diversion of Ganges waters by India and the resulting decrease in flow changed the hydraulic character of the rivers, and brought about changes in the ecology of the Delta. Ganges river ecosystem, which traverses three countries (Nepal, India and Bangladesh) forms one of the largest river ecosystem the world. The livelihood of millions of people depends on the healthy functioning of this ecosystem.[147]

[145] Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin, Chiang Rai, 5 April 1995, between Cambodia, Laos, Thailand, Vietnam
[146] Signed in Johannesburg on 28.08.95;
[147] Supra note 72 Pp.125.

A study by the Bangladesh Ministry of Water Resources showed that the groundwater table in the *Ganges* dependant region has fallen significantly as a result of the diversion of water from the River at Farakka Barrage point. According to some, this fall in the groundwater table combined with the increased use of groundwater for irrigation (the reduced flow of the Ganges River in the winter season is not able to meet the needs of the region) resulted in the world's worst case of arsenic contamination of groundwater in Bangladesh.[148] Apart from arsenic contamination of groundwater in Bangladesh, in view of such aspects as the unknown flow of many underground aquifers and the likely delayed disclosure of such harm, the establishment of harm, let alone its degree, in the case of groundwater is likely to be a difficult task, underlining the importance of applying the precautionary approach and a thorough impact assessment.

Moreover, the ecological impacts due to the reduced river flow have been dramatic. The salinity front has traveled upstream up to 280 km, and the salinity in surface water in the area has increased almost sixty-fold. The increase in salinity and the encroachment of saline water have affected soil and plant nutrients, resulting in the wide-spread death of trees. The largest natural mangrove forest in South Asia, the Sundarbans (World Heritage) is losing about millions of dollars worth of timber every year. Moreover, Sundarbans is intersected by a complex network of tidal waterways, mudflats and Small Island of salt-tolerant mangrove forests, and presents an excellent example of ongoingecological process. The area is known for its wide range of fauna. It is worthy to note that Sundarbans Reserveved fores is listed as one of the ramsar

[148] see A.T.M. Shamsul Huda, Constraints and Opportunities for Cooperation towards Development of Water Resources in the Ganges Basin, Sustainable Development of the Ganges-Brahmaputra-Meghna Basins, edited by Asit K. Biswas and Juha I. Uitto, United Nations University Press, 2001.

cite, along with *Tangoar Hour.*[149] *Tangoar haor, recognized as a Ransar* is the most important fresh water wetland, the side lines in the North-eastern part of the country in the flood plain of *Surma* river one of the main tributaries of the Brahmaputra. *Tangoar haor* provides habitat for at least 135 fish and 208 bird species including 92 water bird species and 98 migratory bird species. *Tangoar haor* also supports a rich fishery and is regarded one of the country's richest bidding grounds for fresh water fish. These wetlands are also remarkable for protection from the tidal search generated from cyclonic depression in the Bay of Bengall. However, reduction of fresh water flow due to water diversion by the construction of dams combined pollution affected the plant and fish population.

Bangladesh and India are parties to a number of global environmental conventions, which are potentially applicable to the shared natural resources. Among them the Conservation of Wetland of International Importance (commonly known as Ramsar Convention) [150] aims to prevent the progressive encroachment on and loss of wetlands. Article 5 of the Ramsar Convention requires the Contracting Parties to consult each other about implementing obligations arising under the Convention in respect of transboundary wetlands, shared watercourses and coordinated conservation of wetland flora and fauna. The Convention on Biological Diversity (CBD) goes beyond Ramsar by laying down the general rule that national sovereignty over natural resources is qualified by the obligation of not causing transboundary environmental harms. Article 3 of CBD provides that "States have, in accordance with the Charter of United Nations and the principles of international law, sovereign rights to exploit their own resources pursuant to their own environmental policies, and the responsibility to

[149] Supra Note, 26.
[150] Signed on 2 February 1971, in force since 21 December 1975; 11 ILM 1972

ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction."

Moreover, it is apprehended that the proposed river-linking project will encounter significant socio-economic, ecological, environmental, biological and gradual deterioration of morphological characteristics of the rivers-systems in Bangladesh. Taking into account the lack of information on complex interactions and groundwater resources, the precautionary approach would be an appropriate principle for the proposed water diversion that poses significant harm for environment and ecology of Bangladesh. To ignore the possibility of imminent and serious environmental harm, because of uncertainty, would be contrary to the principle of *sic utere tuo* as the opportunity to prevent the harm would be foregone. Although all states have the right to initiate development projects, they are obliged under international law to ensure sustainable development. They are therefore under a duty to ensure that those projects do not significantly damage the environment of other countries. Therefore, without EIA India's initiatives on river linking project is a violation of principles of international law on sustainable development, environment and human rights law and goes against the integrated water resources management concept.

However, an integrated approach towards transboundary resource management requires effective institutional frameworks considering the monitoring and implementation procedures. Therefore cooperation based on the mutual interests to implement joint development projects could open huge opportunity in South Asian countries. Cooperation and institutional arrangements with particular technical equipments, are further needed to oblige the emerging principles of procedure rules to

ensure the environmentally sound water resource development and management, those are discussed in the next section.

3.3. Emerging principles and prospects for technical cooperation

Implementation of the principles and rules of prevention and mitigation under the auspices of international institutions and agencies is one of the characteristics of international environmental law. It is common that multilateral treaties that stipulate newly emerging principles and rules of prevention and mitigation provide for an institutional framework - such as an Executive Body, a Conference or Meeting of the Parties, and a Secretariat - to implement the objectives of the treaties on the basis of a general obligation to cooperate. UN Water Convention also emphasized on such procedure rules to prevent and mitigate the possible herm of international harm. So it requires examining both spheres of international law and as such the principles and rules are discussed in more detail.

The principle of exchange of information

Pertinent scientific, technical, socio-economic, business, commercial, and legal information are prerequisites for the implementation of international concerted actions to prevent or mitigate environmental harm arising from global environmental change.[151] Article 4, of the Vienna Convention the Parties are obliged to provide scientific, technical, socio-economic, commercial, and legal information as further elaborated in Annex II to (international) bodies agreed upon by the Parties. The bodies then disseminate such information to any requesting Parties.[152]

The Principle of exchange of information is represented in both the ECE and Water Convention. Article 13 of ECE obliges riparian parties to exchange information

[151] Edith Brown Weiss, *Environmental Change and International Law: New Challenges and Dimensions*, UNU, 1992.

and a duty to exchange data and information can be found in Article 9 of the Watercourses Convention. Article 9.2 provides that, if a watercourse State is requested by another watercourse State to provide data or information that is not readily available, it shall employ its best efforts to comply with the request.[153] The Watercourses Convention stipulates that this includes data and information, those resulting from environmental impact assessments (EIA). The arbitration tribunal in the *Lac Lanoux* Arbitration held that 'A state wishing to do that which will affect an international watercourse cannot decide whether another state's interests will be affected; the other state is sole judge of that and has the right to information on the proposals.'

However, cooperation to govern international watercourses needs both individually and jointly through regional and international institutions to exchange such information as it can be easier to exchanged and disseminated to all the Parties if they are supplied to international bodies.

Principles of prior notice, environmental impact assessment, and consultation

Principles of prior notice, environmental impact assessment, and consultation help to prevent disputes from arising in the transfrontier pollution context between the "acting" state(s) and the "affected" state(s) by providing the "affected" state with pertinent information of the planned activities of the "acting" state and with chances to reach an amicable solution to the potential problem between them.[154]

The Watercourses Convention, which mention consultation, negotiation and regulating notification. When needed in the application of equitable and reasonable

[152] Vienna Convention for the Protection of the Ozone Layer, 22 Mar. 1985, Art. 4, 261. L. M. 1529, 1530-1531
[153] Article 9 of the Water Convention.
[154] Edith Brown Weiss, *Environmental Change and International Law: New Challenges and Dimensions*, UNU, 1992

utilization, the Watercourses Convention requires watercourse states to enter into consultations in a spirit of cooperation.[155] Before the imple mentation of any planned measures that may have adverse effects, timely notification is required by the Watercourses Convention, accompanied by data and information, including those resulting from environmental impact assessments.[156] Principle 19 of the Rio Declaration reflects the duty of potentially affected states to notify and consult on activities that might have significant adverse transboundary environmental effect. The environmental assessment can be used to decide whether planned activities will or will not lead to a breach of substantive legal obligations incumbent upon states to prevent unlawful transfrontier pollution, and if they are to be specified in legal instruments.[157]

Under customary international law there seems to be a duty of prior consulta tion. The 1957 *Lac Lanoux* arbitration (Spain v. France) affirms that prior consultation and negotiation constitute a principle of customary law. Therefore in the case that a use of shared resources may involve serious injury to the rights or interests of another state, it is a duty under international law to give prior notice, consult and negotiate.

The principle of risk assessment, warning, and emergency assistance

According to Article 28.1 of the Water Convention, an emergency situation is considered as a situation that causes or poses an imminent threat of causing, serious harm to watercourse States or other States and that results suddenly from natural causes, such as floods, the breaking up of ice, landslides or earthquakes, or from human conduct, such as industrial accidents. Moreover, the Watercourses Convention

[155] Article 6.2, Water Convention.
[156] *Ibid,* Article 12.

applies to the emergency situations where the prompt notification of other potentially affected states and competent international organizations is required.[158]

Article 14 of the ECE convention, obliges to state parties to notify any critical situations and provide mutual assistance. Principle 18 of the Rio Declaration deals with the obligation of states to notify other states in case of emergencies and Emergency situations include disasters such as those caused by floods and heavy pollution.[159]

The principle of cooperation in scientific research, systematic observations, and assistance

Since environment is a global concern, the principle of cooperation in scientific research and in systematic observations worldwide is very significant instruments to face the environmental challenges. Cooperation is further needed for scientific research and systematic observations, environmental monitoring, and the collection, validation, and transmission of scientific data. Article 200 of the 1982 UN Convention on the Law of the sea[160] provides that states to cooperate, directly or through competent international organizations, to promote studies and undertake programs of scientific research. Moreover, article 204 provides that the parties endeavor, directly or indirectly or through competent international organizations, to observe, measure, evaluate, and analyze, by recognized scientific methods, the risks or effects of pollution.

[157]International Law Association, *"Rules of International Law Applicable to Transtrontier Pollution,"* Report of (The 60th Conference, 171-176, 1982).
[158] Article 28.2 of the Water Convention
[159] Principle 18**:** States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.
[160] United Nations Convention on Law of the Sea (UNCLOS), 1982.

In sum, technical cooperation is needed with well structured and functional institutional frameworks by bilateral, regional and multilateral to facilitate available of new technologies towards conflict prevention of international fresh water disputes. US-Canada water Commission (IJC) is a good example to prevent and mitigate transboundary fresh water conflict and can be useful for shaping further the institutions those involved with fresh water resource management. IJC was formed to implement the Boundary Waters Treaty signed between the US and Canada in 1909

IJC beyond its initial quasi-judicial role is a science-based institution coordinates cooperation on regulating water supplies on either side of the border, water pollution and environmental impacts of boundary waters, air pollution, and apportions water flows. It is worthy to mention that all the cases referred to the IJC have been resolved *unanimously*.[161] However, next section identifies the issues of India -Bangladesh water conflict that demands the technical cooperation to prevent and mitigate the conflicts and further development water resource management

3.4. India-Bangladesh water conflict and prospect for technical cooperation

One of the key aspects of the Ganges River dispute is the lack of reliable data in terms of river flow rates and water utilization, as well as the precise impact and damage due to unilateral withdrawal of water. Given the general atmosphere of distrust between the two countries, there is very little sharing of data and available data are often called into question. For Ganges River water production, aspects like amounts of rain fall from the monsoons, snow fall and melting rates in the Himalayan Mountains, and river flow patterns should be monitored. To characterize transmission, factors like river flow rates, soil characteristics for ground seepage losses, and evaporation rates are helpful to determine an equitable distribution of water.

The data gathering efforts can also be used for flood warning and monitoring, especially in the low-lying areas of Bangladesh. Since Bangladesh has an elevation very close to sea level, hence flood monitoring and the status of the rivers must be closely tied with possible future rises in the sea level.[162] Principle 18 of the Rio Declaration deals with the obligation of states to notify other states in case of emergencies and Emergency situations include disasters such as those caused by floods and heavy pollution.[163]

Moreover, in case of the proposed river-linking project of India disregarding the possible adverse effects on the co-basin state breach the principles and obligation of the international law for conducting an Environmental Impact Assessment (EIA) and social impacts of this project. India is obliged to make available all information on this project through a transparent and independent professional assessment on the environmental and social impacts.

Moreover, the requirement for transboundary EIA has also been closely linked with practical implementation of the more general concept of sustainable development and with application of the precautionary principle. Further, if the due diligence requirement is the determinative criterion in determining breach of the obligation not to cause significant harm and, possibly, a key factor in determining the equity or inequity of a particular regime of utilization, failure to conduct an adequate EIA is likely, *prima facie*, to indicate such a breach. In the *Gabíkovo-Nagymaros* case, the ICJ confirmed that new environmental norms and standards have emerged which

[161]Maurice Schiff and l. Alan Winters**,** Regional *Cooperation, and the role of International Organizations and regional integration* World Bank Policy Research Working Paper 2872, July, 2002.
[162] Reshad Md. Ekram *Ali, Integrated River Basin Management to solve the Solve the Problem of Flood Hazard in Bangladesh*, Regional Seminar on Conflict Management of international River Basins, Dhaka, 1999.
[163] Principle 18**:** States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted**.**

must be taken into account when States consider projects or activities which might involve adverse environmental impacts. The Court stated:

Throughout the ages, mankind has, for economic and other reasons, constantly interfered with nature. In the past, this was often done without consideration of the effects upon the environment. Owing to new scientific insights and to a growing awareness of the risks for mankind – for present and future generations – of pursuit of such interventions at an unconsidered and unabated pace, new norms and standards have been developed, set forth in a great number of instruments during the last two decades. Such new norms have to be taken into consideration, and such new standards given proper weight, not only when States contemplate new activities but also when continuing with activities begun in the past.[164]

Reliable information dissemination could play the key rule and the first very step to construct the arguments to resolve these disputes. Bangladesh needs to gather reliable data regarding the water resources, land use, and the overall environmental impact of reduced river flow rates. A well defined information flow path must be established to initiate an effective bilateral negotiation for an effective institutional mechanism. The international community is also responsible for establishing institutions to facilitate scientific research and systematic observations and monitoring of instruments and methods. Therefore unilateral, bilateral and multilayer initiatives are necessary to resolve the existing disputes and to form a well structured institution to avoid further conflicts. Unfortunately the existing Joint Rivers Commission body does not possess the independent power to formulate and implement solutions, but there is an opportunity to assemble JRC to make more structural and functional

[164] *Gabcikovo -Nagymaros* case, Para. 140

However, the next chapter would shed the light on effective institutional structures and functions of shared water resource management.

Chapter Four

4.1. Conflict and cooperation: Comparative study on some other transboundary river basins

The role institutional arrangement to pursue the efforts undertaken regionally or bilaterally to promote integrated water resource management and prevention and conflict resolution of the respective basins is very significant. The structure and functions of the institution involves administration, management, technical and financial matters, thus it requires primarily political compromise and commitment for effective joint mechanisms with formal and legal agreements. Moreover, the provisions adopted in the agreements must take into account the guiding principles of customary international law, such as the duty to cooperate and negotiate in good faith with other states on navigation, water allocation, water use, water quality/quantity and so on. Therefore, the purpose of this study in this section is to make a comparative analysis on significant features of the institutions of established by some other international river basins states to asses the effectiveness and to compare with JRC founded by joint effort by India and Bangladesh responsible for Ganges river basin.

4.1.1. Institutional Arrangements: prospect for cooperation

Institutional arrangements with due legal mandate that ensure transparency, accountability and cooperative management contribute to the implementation of joint initiatives in relation to sustainable water resource development and management. Particularly for this study, it is imperative to examine the level of structure and function of the institutions and level of cooperation and obligation that exist in different river basin management mechanisms. The perspectives of the most

cooperative and more committed basins Senegal, Niger, Colorado and Rio Grande[165] are discussed further. It is worthy to look at Senegal and Niger basin from the developing country perspectives.

Niger River Basin

The Niger is the second longest river in Africa after the Nile. It is about 4,100 km long and has a basin area of 1,471,000 square kilometers.[166] The Niger Basin Authority (NBA) is an intergovernmental organization formed in late 1980 substituted the Niger River Commission (RNC), which was established in 1964 in accordance with the Act of Niamey in 1963, through an agreement signed by nine riparian countries, namely: Benin, Burkina Faso, Cameroon, Chad, Coté d'Ivoire, Guinea, Mali, Niger, and Nigeria.

The Niger basin Authority (NBA) is a multi-purpose institution was formed with a view to promote cooperation among the basin states for integrated water resource management and development coordinating the regional and national policy frameworks. All member states are obliged to inform undertaking initiatives in relation to river Niger, base on the principle of cooperation to avoid adverse impacts on the other countries. Higher decision making of NBA lies to the Summit of the heads of state and its executive body comprising the council of Ministers and executive secretary is charged with preparing meeting for Head of States and mandated to mobilize the resources.

Specifically, this organization works in areas such as data collection and processing, navigation planning, water control and utilization, sedimentation control,

[165] Kliot, N., Shmueli, D. and Shamir, U. *Development of institutional frameworks for the management of transboundary water resources, Int. J. Global Environmental Issues*, 2001, Vol. 1, Nos. ¾, Pp. 309.

irrigation development, infrastructure development, hydropower and environmental monitoring. The projects implemented successfully by NBA includes monitoring and forecasting using real time data transmitted by satellite and training and research into hydrometeorology to assist the member countries as means for forecasting the flow pattern of the river, that is particularly important for drought and flood control. Moreover projects undertaken on desertification and sedimentation reflect technical cooperation among the basin states to prevent the hydrological adverse impacts of the river basin.[167] It is praiseworthy to note that the convention adopted a particular provision to deal with transboundary environment and ecological impacts.[168]

United Nations and different donor agencies, including financial institutions such as World Bank, are involved with this organization to assist financially and technically. However, many of the development plans have not been implemented due to institutional weakness and financial problems and broadly relate the political instability in the region. The level of cooperation in the Niger is low, though its structure allows it a very high level.[169]

Senegal River Basin

The *Senegal* river basin is formed at the confluence of the *Bafing* river and the *Bakoye* river near *Bafoulabe* in Mali which is about 1050 km from the river's mouth at the *Atlantic* ocean.[170] Three of the four river basin states *Mali, Mauritania* and *Senegal* singed a treaty and established the *Senegal* river Development Organization (OMVS) in 1972. However, *Guinea* was one of the members of the Organization of

[166] Transboundary River/Lake Basin Water Development in Africa: Prospects, Problems, and Achievements, United Nations Economic Commission for Africa Addis Ababa, Ethiopia December 2000, Pp, 21.
[167] Supra not 183
[168] Article 4(2)(c) of the Convention of 1980 that established the NBA, provisions include environmental damage prevention and control, and its conservation including prevention and control of water pollution and promotion of human health as well as flora and fauna in the basin.
[169] Supra note, 165, Pp. 315.

the *Senegal* river Riparian States (1968), which was predecessor of OMVS along with the Inter-State Committee for Development of the *Senegal* river (1963).[171] The objectives of the OMVS are promotion of inter-country co-operation, co-ordination of technical, economic studies and other activities related to the *Senegal* river development such as navigation (Port facilities), irrigation, hydropower generation, salt water prevention, environmental protection and conservation etc, regulation of river flow for irrigation, flood control, power generation and other purposes. [172]

The organizational framework of OMVS is well organized embrace all the actors and stakeholders to participate effectively in the management mechanisms. There are two organs work within the OMVS, namely permanent and non permanent. Permanent body comprised with Conference of Heads of State and Government, Council of Ministers, High Commission and Permanent Water Commission. High Commission acts as an executive body and Permanent Water Commission made up of representatives of the organization's member states and advises the Council of Ministers. In addition, Water Commission defines the principles of and procedures for the allotment of Senegal River water between member states and use sectors. Non permanent bodies include an OMVS national coordination committee in each member state, local coordination committees, regional planning Committees, and consultative committee.[173]

Likewise Niger river basin, Senegal with financial and technical support from international organizations developed number of successful projects, which reflects

[170] Supra note, 166, Pp. 22.
[171] The three Senegal basin states (Mauritania, Mali, and Senegal) signed some agreements including the Convention Establishing the OMVS (Organisation pour la Mise en Valeur de Fleuve Senegal), adopted at Novakchott on Dec. 17, 1975; and the Convention Relating to the Status of the Senegal River, adopted at Novakchott (Mauritania) on Mar. 11, 1972.
[172] *Ibid*
[173] Senegal River Basin, Guinea. Mali, Mauritania and Senegal, Senegal River, by the Organization f the development for Senegal River.

the high level of cooperation among the basin states. For more than thirty years now, they have been able to find suitable solutions to all of the technical, social, political and other problems linked to the development of the *Senega*l River basin's water resources.[174] It reflects the level of functional effectiveness of the organization and intensity of cooperation is considered very high.[175]

Colorado and Rio Basins

The Water Commission (IBWC/CILA), a bilateralorganization arranged of two sections under the respective foreign ministries of *Mexico* and the U.S., was formed in according to the 1944 Water Treaty. The IBWC/CILA functions primarily on technical and scientific issues such as planning with due consideration for local priorities on water infrastructure generating binational support for joint projects One of the minutes of binational policy negotiation stated that IBWC/CILA "shall establish a binational team of technical experts in wastewater matters from competent agencies of each country".[176]

The 1906 convention is named 'The 1906 Convention for the Equitable Division of the Waters of the Rio Grande/Rio Bravo for Irrigation Purposes', and the1944 Treaty specified the equitable distribution of the waters from the lower Rio Grandeand the Colorado. An equitable approach was adapted also to binational financing of water improvement projects.[177]

Apart from IBWC the Border Environment Cooperation Commission (BECC) formed in 1993 under the North American Free Trade Agreement (NAFTA) is particularly important from the environment and ecological aspects. BECC is

[174] *Ibid*
[175] Supra note 165, Pp. 315
[176] Dr. Christopher Brown, Transboundary Water Resource Issues on the U.S.-Mexico border: Challenges and Opportunities in the 21st Century, VertigO, hors-série no 1
[177] Supra note 165, Pp. 316.

responsible to provide technical support to local and regional efforts to build infrastructure that can improve *U.S. - Mexico* border environmental quality, to analyze the economic and technical feasibility of proposed projects, and to certify projects for funding by the second of the institutions to arise from the NAFTA debate, the North American Development Bank (NADBank) projects. The IBWC is one of the most veteran and experienced institutions for the management of transboundary water resources.[178]

In view of the fact that conflict resolution mechanisms are a part of the institutional framework and significant for the prospect of cooperation for the basin states concerned. Dispute settlement mechanisms are also found within the institutional arrangements of these three river basins. The institutional mechanisms of Niger Basin Authority is competent enough to prevent the disputes, nevertheless if dispute arises institutional arrangements comprise the mechanism to settle the disputes. If this mechanism fails, a dispute must be referred to arbitration to the Organization of African Unity. In case of Senegal river basin, a particular forum is to be established for discussion through NBA. This option helps minimize conflicts and most areas of conflicts have been amicably resolved. The most recent example of this is the effort to resolve the problem of management of the Benue river basin.[179] IBWC also provides a mechanism to resolve disputes in relation to the management of the Colorado and Rio-Grande-Rio Bravo basins shared by the USA and Mexico. Furthermore, in relation to dispute settlement, commissions of the both countries initiate and negotiate the disputed issue through respective foreign ministries.

[178] *Ibid*.
[179] Supra note, 166, Pp.34.

Comparative analysis

The three river basins, which were analyzed above, a general pattern is reflected that a certain level of cooperation is gained by a formal institutional structure, though further cooperation is needed particularly for Senegal and Niger river basin management by implementing ongoing projects, those require scientific and technological cooperation for integrated water resource management. Political commitments and involvement of international community can ensure further development through the existing multi-purpose joint development agencies.

The significant features of the institutional arrangements and cooperation found in three river basins could provide further guideline for *Ganges-Bhramaputra-Meghana* river basin in South Asia to initiate an integrated approach for cooperative water resource management. Furthermore a comparative analysis on these three river basins and the Joint Rivers Commission (JRC), the only joint structure between India and Bangladesh for water resource management would lend a hand to find out the existing limitations and future opportunities.

Joint Rivers Commission (JRC) was established against the backdrop of hopes, expectation and goodwill that generated from the friendship between India and *Bangladesh* during the liberation war of *Bangladesh*.[180] JRC is also a bilateral organization based in Dhaka and Delhi, capitals of *Bangladesh* and *India* respectively. The statute of JRC, suggests appointment of experts and advisers as it desires the scientific and technical cooperation likewise IBWC, which calls for binational team of technical experts to be appointed based on necessity. The Chairmanship of the Commission of JRC is confined for the Ministers of Water Resources Ministries, annually in turn by *Bangladesh* and *India*. Similar role of the political leaders is found

[180] Supra note 18.

in the institutions those govern the *Senegal* and *Niger* basins, but the national leaders play no formal part in the structure of IBWC.

It is important to look at the statutory provisions of this bilateral organization to identify the possibility for integrated water resource management. The Statute set out the function of the commission is to 'ensure most effective joint efforts in maximizing the benefits from common river system to both countries'. Article 4 of the Statute specifies that the projects to be formulated are 'flood control and irrigation projects' and reiterated that the objectives would be mutual benefit of the people of two countries. This provisions offer an enormous opportunity to cooperate between the countries as like as *Niger* and *Senegal* river basins, those initiated number of successful projects with internal and external financial resources. It is noteworthy to mention here that the mega project of river-linking to implemented with financial support of World Bank.

Similar to the constituent instruments of three river basins discussed above, JRC Statute spells out the procedural rules for carrying out its objectives. Chapter V of the Statute provides that the ordinary session of the Commission shall be held generally 'four times a year' and in addition special meeting may be convened at any time at the request of either country. It is worth to mention here that the JRC convened only 36 meetings in the last 35 years and none of them resulted in joint project.[181] The JRC however, failed to live up to its mandate. Moreover, existing institutional arrangements is not adequate to deal with this complex and multidimensional issue of transboundary water management. In this regard the institutional framework adopted by *Senegal* river basin would be useful to rearrange the mechanism ensuring effective participation among the all the actors and stakeholders.

[181] JRC, country office, dated 25, November, 2007.

Nevertheless, it is praiseworthy that the negotiation of JRC resulted to sign the Ganges Water treaty between the countries and enshrined further role to implement that treaty, to settle disputes and to conclude other treaties in relation to other common rivers shared by these countries as agreed in the treaty (Article VII, IX of the Ganges Treat). In the Ganges River Treaty, the primary power to settle any dispute between the parties is given to JRC which has been almost ineffective for a long period. The real dispute settlement power, in the absence of any body with judicial capacity, is given to the political authorities of the two countries which again, as we have seen, are unlikely to come up with real solutions acceptable to both, considering the huge difference in the countries' bargaining power and ineffective institutional mechanisms. However the institution remained weak intentionally because it served the purpose of one of the riparians India.[182] On the other hand, Indus river basin conflict was settled peacefully through involvement of third party and led to adopt a treaty that works for decades successfully. Involvement of third party can be made in case of India-Bangladesh conflict as well. Hence it is important and relevant to illustrate the conflicting issues and the resolution of Indus river basin. The next section discusses the case of Indus River and role of third party from the perspective of cooperation in relation to dispute resolution and water resource management.

4.1.2. Dispute Resolution: A third party involvement and prospect for cooperation

A deeper understanding of multidimensional complexity of international watercourse the international laws and principles, bilateral and multilateral agreements all stressed towards the importance of peaceful dispute resolution and within the institutional frameworks strategies and mechanisms are found to prevent

[182] Kliot, N., Shmueli, D. and Shamir, U. (2001) 'Development of institutional frameworks for the management of transboundary water resources', *Int. J. Global Environmental Issues*, Vol. 1, Nos. 3/4, Pp. 322.

and settle the disputes. UN Watercourse Convention includes detail provisions for dispute settlement, including uses of good offices, mediation, arbitration, conciliation, arbitration and reference to International Court of Justice. Hence the use of good offices, mediation and conciliation procedures suggest a third party involvement as a mediator to negotiate between the concerned states. The initiatives could be undertaken by unilaterally, bilaterally or even multilaterally. Indus river basin dispute set an example of cooperation on third party involvement and therefore the disputed issues and resolution will be closely examined.

Indus River Basin

The Indus river basin comprises the river Indus and its five tributaries *Jlelum, Chenab, Ravi, Beas,* and *Satlej* rivers. They are governed by the treaty between India and Pakistan called the Indus River Treaty, 1960. It is important to look at the background context of adoption the treaty and existing mechanisms for equitable water allocation and resource management in the present treaty.

In the pre independent era, the British engineers began an extensive set of projects to divert the main tributaries of the Indus into a web of irrigating canals to develop irrigation facilities in the then West *Punjub*. After the independence of India and Pakistan in 1947, India removed the network of irrigation infrastructure and tributaries of *Indus* river unevenly, although an agreement was signed between the two newly formed countries to maintain water supplies at the level of pre-independence times. However, disputes over water allocation soon arose and negotiations ensued bilaterally and even once Pakistan initiated to bring the issue before ICJ, while India disagreed.

The extent of the controversy that affected the agriculture of such a large region influenced David Lilienthal,[183] undertook a fact-finding tour and proposes some solutions for water related conflict and proposed a joint program for the development of Indus river basin. . However, Lilienthal's work was brought to the attention of the then president of the World Bank, Eugene Black, who attempted to persuade the two riparians to find a lasting peaceful solution. Finally, the Indus Waters Treaty was signed in 1960 and agreed that the amount of water available from the Indus would be increased by various development projects funded by the World Bank. The Indus Water Treaty is still effective and various projects developed further funded by different donors made it possible to allocate available water for both the countries. [184]

However, Indus Treaty (Article IX (2) of the treaty) that provides the provision to appoint neutral expert to resolve the conflict. [185]Since there is no provision for dispute settlement involving third party in the Ganges water treaty, unlike the Indus Water Treaty, Bangladesh could not compel India to negotiate through third party. India has always showed her reluctance to abide by the set international norms on the third party involvement to settle dispute. It was evident in India's official reservation on the provision of Water convention by maintaining "[a]ny mandatory third-party dispute procedure was inappropriate and should not be included in a framework convention). [186] However, involvement of third party can be made in case of India-Bangladesh water conflict in light of the precedence put forward by Indus River Basin, as World Bank dealt the case with financial and technical support to find a way for a peaceful resolution and further development and management of shared water

[183] Former Chairman of the Tennessee Valley Authority and the US Atomic Energy commission.
[184]See, *Water Sharing Conflicts between Countries and Approaches to Resolving Them*, WASSA Project Reports, volume, 3
[185] Indus Water Treaty, 1960

resources, but it requires primarily political compromise and consensus realizing the human needs of this region.

Concluding Remarks

This research study addressed the disputed issues of equitable and reasonable water sharing of international rivers between India and Bangladesh and comprehensively reviewed and analyzed relevant bilateral, regional and multilateral agreements and also the established and emerging principles of international laws to search for a viable option to resolve the longstanding disputes. The research has also emphasized on ensuring sustainable water resource management.

The crisis over water is mainly viewed as caused by failure of governance, lack of political commitment and people's awareness regarding the gravity of the problem. Consequently, competing claims over water between users within countries and between countries shall have to be managed on the basis of cooperation and not in a confrontational manner. The underlying principle of such management should include the efficient use and allocation of the resource among competing users to prioritize the basic needs of humans and ecosystems.

The examining and analysis of the existing disputes and future threats over shared water resources and the potential scope of resolve in the existing bilateral mechanism between the countries was undertaken as the first task. It is found that existing treaties don't offer effective mechanisms for resolving the conflicts and as such to guarantee and promote sustainable utilization of the common rivers for mutual benefits. These treaties or other agreements have substantive legality, but they are narrow in scope and are not supported by effective institutional mechanisms to

[186] United Nations General Assembly Press Release GA/9248. India's official reservation includes, among other things, that "[a]ny mandatory third-party dispute procedure was inappropriate and should not be included in a framework convention".

prevent and mitigate existing and potential conflicts. The extreme compartmentalization of the regional politics also adds new dimensions to the existing problems that are difficult to be resolved with the provisions of these more generalized treaties. Hence the call made in the case of *Gabcikovo-Nagymaros* for further cooperation between the basin states is the ultimate solution to be integration in the political and policy thinking in South Asia as well.

The second step was to development of a comprehensive analysis on institutional arrangements of different river basins and to examine and identify the important features of those mechanisms and ability to ensure the sustainable water resource management preventing and mitigating conflicts. Senegal River Basin shed the light on effectiveness of joint efforts, particularly developing country perspective. However, Indus river basin set an example for conflict resolution and further cooperation and development of common river basins and third party involvement showed a way for Bangladesh to deal with the same issue with India and responds to the objective of this research study. On the other hand, US-Canada Water Commission (IJC) reflected the most comprehensive arrangements and could be considered as model institution not only for GBM region but also for all other common river basins all over the world.

The above views led to the conclusion that bilateral and regional cooperation is needed to undertake joint efforts to resolve the common problem of flood, drought and ecological disorder and to ensure the best water resource utilization in this region which is the largest pocket of poverty in the world. However, political amity is the prime concern for regional cooperation obliged by the international norms and principles and in accordance with regional agreement under the framework of SAARC. Existing agreements between India-Bangladesh and India-Nepal failed to

mitigate and prevent transboundary river basin conflicts. While India is the downstream state in relation Nepal, it is the upstream state in relation to Bangladesh. It is therefore, essential to review the existing treaties and adopt a regional treaty in line with international rules and principles, particularly the provisions incorporated in Water Convention. It is needed to ensure than no proposal for unilateral withdrawal from common rivers should be allowed to materialize as the same will hamper potential economic growth, defeat the millennium development goals and regional peace and cooperation in this region.

India, the upper stream riparian, withdraws water from the Ganges according to its own priorities without consideration of the needs of the lower riparian Bangladesh. However, due to the absence of mandatory compliance procedure, neither the existing Ganges Treaty nor international law can compel India to ensure equitable share of water resources between Bangladesh and India.

In view of the above, the following recommendations are being made to pursue the legitimate claims of Bangladesh over India in relation to water sharing:

- Existing Ganges Treaty should to be reviewed comprehensively to establish that its governing principles are in line with UN Water Convention.
- Efforts need to be undertaken to promote a regional treaty to include all other international rivers shared by the SAARC countries. The same should integrate the global environmental principles to frame an effective arrangement.
- Existing institutional arrangements within the framework of Joint River Commission is inadequate to deal with this complex and multidimensional issue of transboundary water resource management and development between

India and Bangladesh. In this regard the understandings of institutional frameworks adopted by US-Canada Water Commission (IJC), Senegal River Basin and Indus River Commission would be useful to rearrange the mechanism of JRC ensuring effective participation among the all the actors and stakeholders.

This of course suggests that under present circumstances the government of Bangladesh will probably try to negotiate with India to seek cooperation on equitable sharing of the *Ganges water* and against the proposed river-linking project. In doing so the Government of Bangladesh may will argue the adverse impacts on Bangladesh of the RLP and draw from the legal provisions of Ganges Water Treaty and the emerging and established principles of international laws. However, groundwork is needed to construct the arguments to resolve these existing and potential disputes and further intensive agreement among the co-basin states for sustainable management and development of the shared water resources. Coordinated efforts between GO and NGOs of Bangladesh with the aid of international organizations is crucial to address the issues at the bilateral, regional and international level and to settle the disputes through cooperation.

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Appendix

Treaty Between the government of the Republic of India and the government of the People's Republic of Bangladesh on Sharing of the Ganga/Ganges Waters at Farakka. Signed on December 12, 1996.

The Government of the Republic of India and the Government of the People's Republic of Bangladesh, Determined to promote and strengthen their relations of friendship and good neighborliness, Inspired by the common desire of promoting the well-being of their people, Being desirous of sharing by mutual agreement the waters of the international rivers flowing through the territories of the two countries and of making the optimum utilization of the water resources of their region in the fields of flood management, irrigation, river basin development and generation of hydro-power for the mutual benefit of the peoples of the two countries, Recognizing that the need for making an arrangement for sharing of the Gaga/Ganges waters at Farakka in a spirit of mutual accommodation and the need for a solution to the long-term problem of augmenting the flows of the Ganga/Ganges are in the mutual interests of the peoples of the two countries, Being desirous of finding a fair and just solution without affecting the rights and entitlements of either country other than those covered by this Treaty, or establishing any genera principles of law or precedent,

Have agreed as Follows:

Article –I

The quantum of waters agreed to be released by India to Bangladesh will be at Farakka.

Article –II:

i. The sharing between India and Bangladesh of the Ganga/Ganges waters at Farakka by ten day periods from the 1st January to the 31st May every year will be with reference to the formula at Annexure I and an indicative schedule giving the implications of the sharing arrangement under Annexure I is at Annexure II.

ii. The indicative schedule at Annexure II, as referred to in sub para (i) above, is based on 40 years (1949-1988) 10-day period average availability of water at Farakka. Every effort would be made by the upper riparian to protect flows of water at Farakka as in the 40-years average availability as mentioned above.

iii. In the event flow at Faraka falls below 50,000 cusecs in any 10-day period, the two governments will enter into immediate consultations to make adjustments on an emergency basis, in accordance with the principles of equity, fair play and no harm to either party.

Article –III

The waters released to Bangladesh at Farakka under Article –I shall not be reduced below Farakka, except for reasonable uses of waters, not exceeding 200 cusecs, by India between Farakka and the point on the Ganga/Ganges where both its banks are in Bangladesh.

Article –IV

A Committee consisting of representatives appointed by the two Governments in equal numbers (hereinafter called the Joint Committee) shall be constituted following the signing of the Treaty. The Joint Committee shall set up suitable teams at Farakka and Hardinge Bridge to observe and record at Farakka the daily flow below Farakka barrage, in the Feeder canal, at the Navigation Lock, as well as at the Hardinge Bridge.

Article – V

The Joint Committee shall decide its own procedure and method of functioning.

Article – VI

The Joint Committee shall submit to the two Governments all data collected by it and shall also submit a yearly report to both the governments. Following submission of the reports the two Governments will meet at appropriate levels to decide upon such further actions as may be needed.

Article – VII

The Joint Committee shall be responsible for implementing the arrangements contained in this Treaty and examining any difficulty arising out of the implementation of the above arrangements and of the operation of the Farakka Barrage. Any difference or dispute arising in this regard, if not resolved by the Joint Committee, shall be referred to the Indo-Bangladesh Joint Rivers Commission. If the difference or dispute still remains unresolved, it shall be referred to the two governments which shall meet urgently at the appropriate level to resolve it by mutual discussion.

Article – VIII

The two Governments recognise the need to cooperate with each other in finding a solution to the long term problem of augmenting the flows of the Ganga/Ganges during the dry season.

Article – IX

Guided by the principles of equity, fairness and no harm to either party, both the Governments agree to conclude water sharing Treaties/Agreements with regard to other common rivers.

Article – X

The sharing arrangements under this Treaty shall be reviewed by the two Governments at five years interval or earlier, as required by either party and needed adjustments, based on principles of equity, fairness and no harm to either party made thereto, if necessary. It would be open to either party to seek the first review after two years to assess the impact and working of the sharing arrangements as contained in this Treaty.

Article – XI

For the period of this Treaty, in the absence of mutual agreement on adjustments following review as mentioned in Article X, India shall release downstream of Farakka Barrage, water at a rate not less than 90% (ninety percent) of Bangladesh's share according to the formula referred to in Article II, until such time as mutually agreed flows are decided upon.

Article – XII

This Treaty shall enter into force upon signatures and shall remain in force for a period of thirty years and it shall be renewable on the basis of mutual consent. In witness whereof the undersigned, being duly authorised thereto by the respective Governments, have signed this Treaty. Done at New Delhi, 12th December, 1996, in Hindi, Bangla and English languages. In the event of any conflict between the texts, the English text shall prevail. Signed: the Prime Minister of the Republic of India; the Prime Minister of the People's Republic of Bangladesh.

Annexure –I

Availability at Farakka	Share of India	Share of Bangladesh
70,000 cusecs or less	50%	50%
70,000-75,000 cusecs	Balance of flow	35,000 cusecs
75,000 cusecs or more	40,000 cusecs	Balance of flow

Subject to the condition that India and Bangladesh each shall receive guaranteed 35,000 cusecs of water in alternative three 10-day periods during the period March 1 to May 10.

Annexure –II

(Indicative schedule giving the implications of the sharing arrangement under Annexure-I for the period 1st January to 31st May). Figures in cusecs.

Period	Average of Actual Flow (1949-1988)	India's Share	Bangladesh's Share
January			
1-10	107,516	40,000	67,516
11-20	97,673	40,000	57,673
21-31	90,154	40,000	50,154
February			
1-10	86,323	40,000	46,323
11-20	82,839	40,000	42,839
21-28	79,106	40,000	39,106
March			
1-10	74,419	39,419	35,000
11-20	68,931	33,931	35,000
21-31	63,688	35,000	29,688
April			
1-10	63,180	28,180	35,000
11-20	62,633	35,000	27,633
21-30	60,992	25,992	35,000
May			
1-10	67,251	35,000	32,351
11-20	73,590	38,590	35,000
21-31	81,834	40,000	41,854